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National Defence Défense nationale

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TECHNICAL AIRWORTHINESS MANUAL (TAM)

(ENGLISH)

Issued on Authority of the Chief of the Defence Staff

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PART 1
MANAGEMENT FRAMEWORK

CHAPTER 1 - AIRWORTHINESS FUNDAMENTALS

SECTION 1

INTRODUCTION

1.1.1.1 Background

1. ***Aeronautics Act.*** The authoritative document for both civil and military aviation safety in Canada is the *Aeronautics Act*. As a statute of Canada, the Act is a law that prescribes requirements for all aspects of aeronautics, including the following:

a. promotion of aeronautics;

b. design, manufacture and maintenance of aeronautical products;

c. facilities and services;

d. investigation of aviation safety matters, including preservation of evidence, record keeping and Boards of Inquiry; and

e. other matters relating to the safety of aviation in Canada.

2. Under the provisions of the Act, the Minister of Transport (MOT) is responsible for civil aviation in Canada, while the Minister of National Defence (MND) is responsible for military aviation, including foreign military aircraft within Canada. Implementation of the Act's provisions is ultimately a legal responsibility for the Department of National Defence (DND) and the Canadian Armed Forces (CAF).

3. **Objectives.** The main objective of the Act is to achieve an acceptable level of aviation safety for Canada's civil and military aviation activities. Aviation safety involves many areas including:

a. the design, manufacture, maintenance and operation of aeronautical products;

b. the control of Canadian airspace;

c. the operation of airports and aviation-related facilities;

d. the control of aviation services; and

e. aviation security.

1.1.1.2 DND/CAF Airworthiness Program

1. An airworthiness program contributes to aviation safety by influencing areas related to aeronautical products and their operation. The elements of an effective airworthiness program consist of an entire range of aviation activities including design, manufacture, maintenance, materiel support, facilities, personnel and operations. These elements are shown in Figure 1-1-1-1.

2. **Program Framework.** The operational staff within the CAF is responsible for flying operations, aerospace control and operator training and qualification. Similarly, the technical staff is responsible for the design, manufacture, maintenance and materiel support of aeronautical products, as well as for the training and qualification of technical personnel. Accordingly, the airworthiness program elements have been similarly split into Operational and Technical areas of responsibility. This division of responsibility has given rise to the Operational and Technical Airworthiness Programs. The Airworthiness Investigative Program has been added to monitor the airworthiness program and investigate aviation safety-related issues and occurrences.

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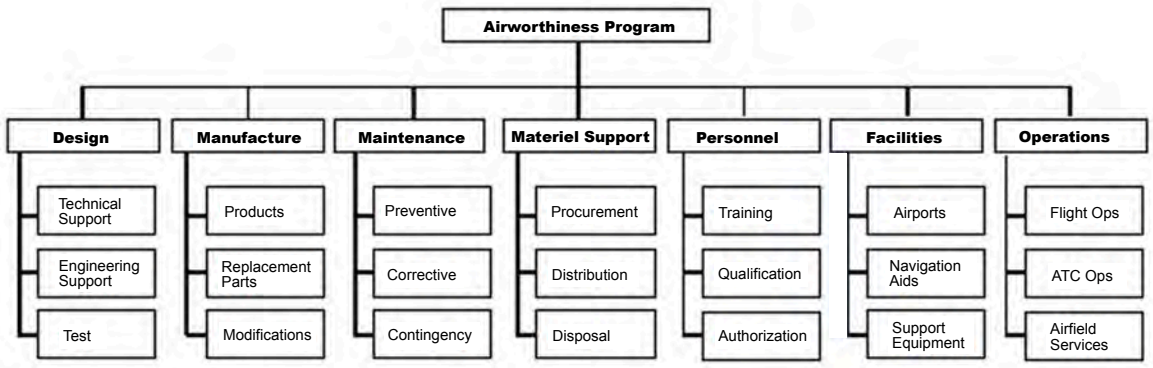

Figure 1-1-1-1 Airworthiness Program Elements

3. Figure 1-1-1-2 illustrates how the airworthiness elements are mapped into these functional areas of responsibility for the DND/CAF Airworthiness Program. The overall implementation of the airworthiness program and responsibility for the regulation of the entire program is assigned to an individual designated by the MND as the Airworthiness Authority. The technical areas of the program are grouped under the Technical Airworthiness Program. The operational areas of the program, which include operational and flying regulations, are grouped under the Operational Airworthiness Program. Shared by the Operational and Technical programs is the regulation of personnel and facilities. Finally, the investigator's role is assigned to the Investigative Program.

4. Under the provisions of the *Aeronautics Act*, the MND delegates powers and responsibilities to the Airworthiness Authority; Technical Airworthiness Authority; Operational Airworthiness Authority; and Airworthiness Investigative Authority. Their roles and responsibilities are summarized below.

a. **Airworthiness Authority (AA).** The AA is responsible for the development, promotion, supervision and management of an Airworthiness Program for the DND/CAF. This includes the nomination of competent individuals to fill the roles of Operational and Investigative Airworthiness Authorities described below and, in consultation with ADM (Mat), the nomination of a competent individual to fill the role of Technical Airworthiness Authority.

b. **Technical Airworthiness Authority (TAA).** The TAA is responsible for the regulation of the technical airworthiness aspects of design, manufacture, maintenance and material support of aeronautical products and the determination of the airworthiness acceptability of those products prior to operational service.

c. **Operational Airworthiness Authority (OAA).** The OAA is responsible for the regulation of all flying operations. This includes responsibility for operational procedures, flight standards, operator training, qualification and licensing, aerospace control operations and operational airworthiness clearance of aeronautical products prior to operational service.

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d. **Airworthiness Investigative Authority (AIA).** The AIA is responsible for the regulation of the airworthiness aspects of the Flight Safety Program. The AIA is also responsible for the investigation of airworthiness-related occurrences and for the monitoring of the Technical and Operational Airworthiness Programs to identify deficiencies.

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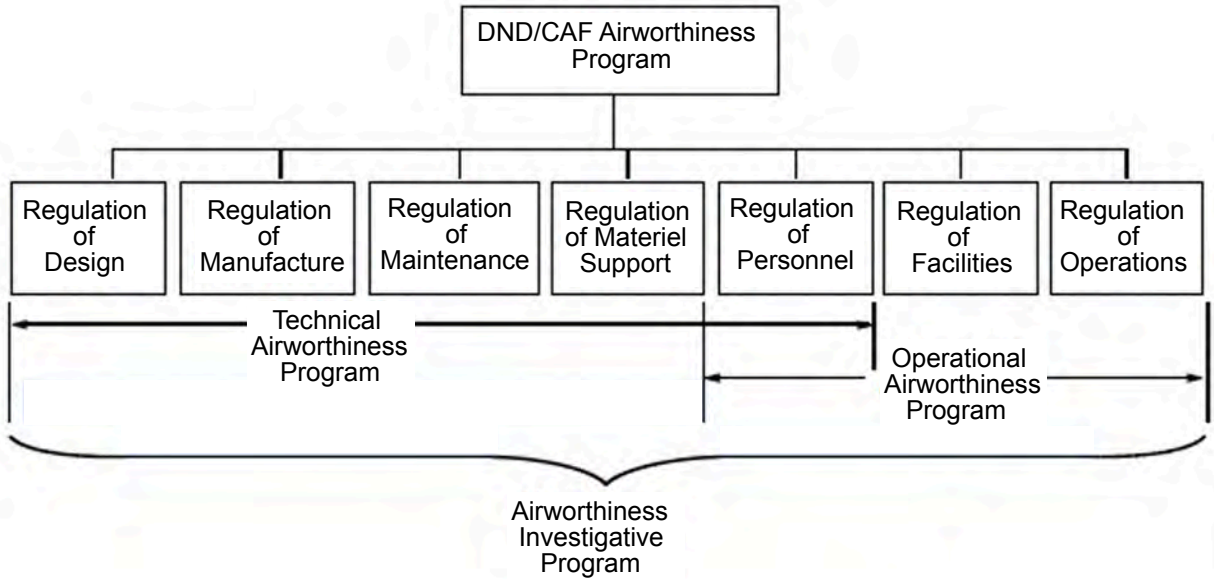

DND/CAF Airwrothiness Program - Regulates aspects of aviation activities, facilities and services to ensure and maintain the airworthiness of military aeronautical products and provide for the safe operation of those products.

Technical Airworthiness Program - Regulates technical aspects of military aviation safety and provides an acceptable level of safety for aeronautical products in compliance with the applicable design, manufacturing, maintenance and materiel support rules and standards.

Operational Airworthiness Program - Regulates operational aspects of military aviation safety and provides an acceptable level of safety for the operation of aeronautical products in compliance with the applicable rules and standards.

Airworthiness Investigative Program - Regulates the airworthiness aspects of the Flight Safety Program, monitors the Technical and Operational Airworthiness Programs for deficiencies and investigates airworthiness-related occurrences and issues.

Figure 1-1-1-2 DND/CAF Airworthiness Program

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1.1.1.3 Philosophy

1. The philosophy of the DND/CAF Airworthiness Program is to provide an acceptable level of aviation safety for military aeronautical products based on fundamental principles and practices used by military and civil airworthiness authorities worldwide and tailored to meet the unique DND/CAF needs and objectives.

1.1.1.4 Principles

1. The DND/CAF Airworthiness Program is based on the fundamental principles that airworthiness-related activities are:

   a. completed to **accepted standards**;

   b. performed by **authorized individuals**;

   c. accomplished within **Acceptable Organizations**; and

   d. done using **approved procedures**.

2. As an example, these principles are applied to the conduct of aircraft maintenance as follows:

   a. an approved maintenance program and organizational processes must be developed in compliance with the applicable technical airworthiness rules and standards;

   b. maintenance tasks must be accomplished by technicians who are assessed as competent and authorized;

   c. maintenance organizations must be deemed acceptable by the TAA as meeting the applicable technical airworthiness criteria; and

   d. the maintenance procedures and inspection schedule are approved prior to the introduction into service use of the aircraft type and controlled throughout the service life.

1.1.1.5 Concepts

1. An effective airworthiness program embodies the following concepts:

   a. controls and formally documents the assignment of authority including the associated responsibilities and accountability;

   b. establishes independence between the regulator (individual who makes the rules or "rule-maker") and the implementor (individual who conducts the aviation activity or "doer");

   c. controls the design, manufacture, maintenance, materiel support and operational usage of aeronautical products;

   d. ensures the airworthiness of aeronautical products prior to service use;

   e. ensures the initial state of airworthiness established prior to service use is maintained throughout the operating service of aeronautical products;

   f. ensures that all airworthiness-related activities involving aeronautical products are conducted under the framework of an effective quality management system; and

   g. meets the objectives of the*Aeronautics Act*.

1.1.1.6 Regulatory Approach

1. A regulatory approach is the most common method employed to implement these concepts and principles in an airworthiness program. Regulate means to control by rule and involves using regulations, orders, directives

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and standards to control airworthiness-related activities. A regulatory approach for controlling airworthiness-related activities has the following three distinct roles:

a. **Regulator.** The Regulator develops the rules and standards for design, manufacture, maintenance, material support and operation of aeronautical products and ensures compliance (e.g., Transport Canada for civil aviation);

b. **Implementor.** The Implementor conducts the aviation activities associated with the design, manufacture, maintenance, materiel support and operation of aeronautical products (e.g., airlines, manufacturers and maintenance organizations for civil aviation); and

c. **Investigator.** The Investigator investigates airworthiness-related aviation safety occurrences and aviation safety issues. The Investigator is normally 'independent' from the Regulator and the Implementor. The Investigator is also empowered to investigate the role that the Regulator and Implementor may have had in any aviation occurrences. (e.g., Transportation Safety Board for Civil Aviation)

2. Unlike civil aviation, where the airworthiness Regulator, Implementor and Investigator are totally independent, DND has been assigned a self-regulating and self-investigating responsibility for airworthiness by the *Aeronautics Act*. Self-regulation and self-investigation are common features of many military activities, including military airworthiness programs.

3. For DND, self-regulation facilitates the accomplishment of military missions or tasks assigned by the government during emergency situations, such as the defence of Canada, search and rescue and aid to the "civil power". During these situations, a military commander must have the flexibility to balance the mission accomplishment demands with aviation safety goals. The military commander determines how best to apply the airworthiness rules and standards within the context and risks of the assigned mission requirements and the urgency of the situation.

4. However, the self-regulation feature does not imply that the military can ignore the need for independence. In organizations as large as DND/CAF, it is possible to establish an appropriate degree of independence between the "rule-makers" and the "doers". Furthermore, the risk associated with military aviation demands that a suitable degree of independence be built into a military airworthiness program. Figure 1-1-1-3, provides a comparison of the regulator and implementor roles.

	Regulator (Rule-maker) **Issues the airworthiness rules and standards and assesses compliance**	**Implementor (Doer)** **Conducts aviation-related activities**
Legal Basis	*Aeronautics Act*	*National Defence Act*
Authority	assigned by delegated Airworthiness Authority	chain of command
Responsible to	delegated Airworthiness Authority	supervisor
Accountable for	authorized airworthiness-related decisions and functions in accordance with rules and standards	assigned activities related to job position or rank in accordance with authoritative direction and procedures
Actions	performs airworthiness management role and/or assigned airworthiness functions on behalf of the delegated Airworthiness Authority	conducts aviation activities such as design, maintenance, procurement and operation

Figure 1-1-1-3 Regulator/Implementor Comparison

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SECTION 2

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PART 1
MANAGEMENT FRAMEWORK

CHAPTER 2 - TECHNICAL AIRWORTHINESS PROGRAM OVERVIEW

SECTION 1

INTRODUCTION

1.2.1.1 Airworthiness Process

1. Assuring the airworthiness of aeronautical products is a multidimensional process including a wide range of activities in the diverse fields of design, manufacturing, maintenance, materiel support and operations. Figure 1-2-1-1, provides a high level description of the airworthiness process from a technical perspective.

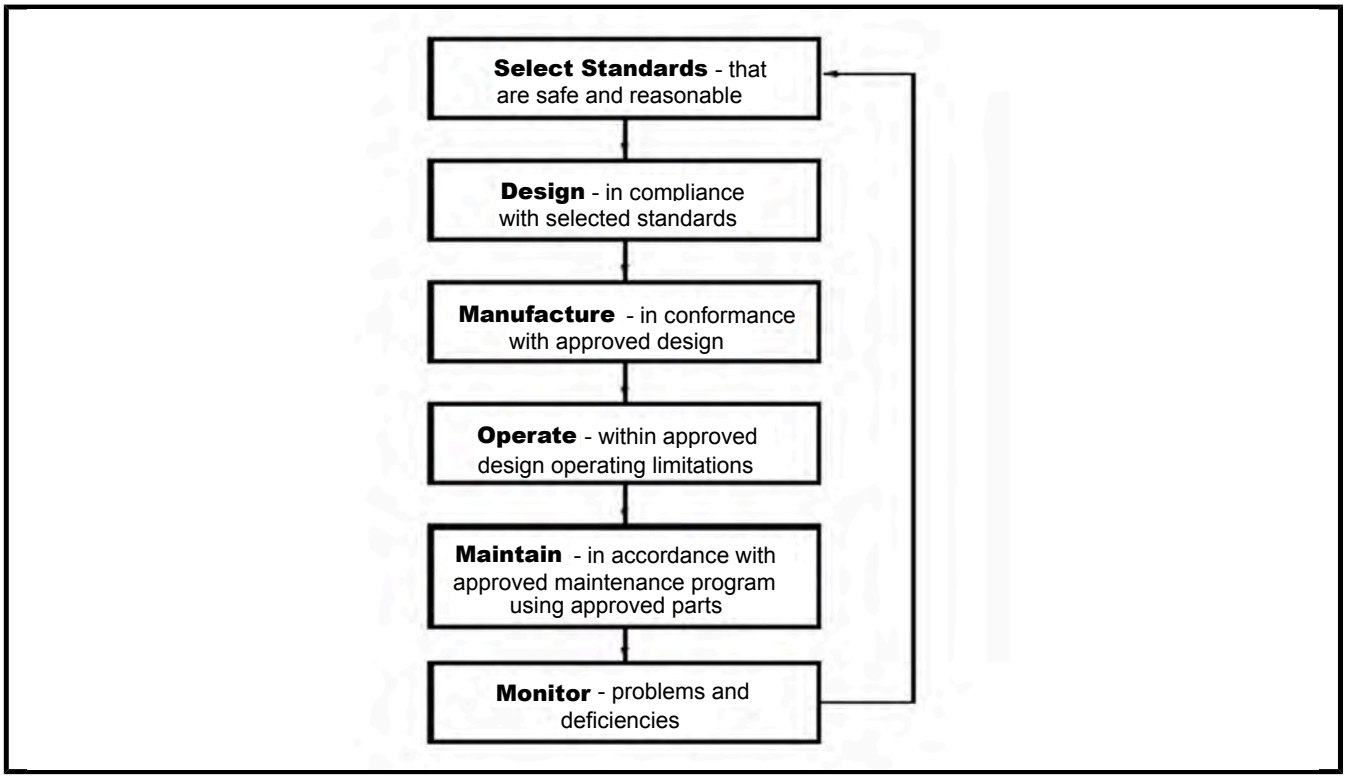

Figure 1-2-1-1 Airworthiness Process

1.2.1.2 Technical Airworthiness Program

1. The TAA, as a delegated authority of the Minister of National Defence (MND) under the provisions of the *Aeronautics Act*, has been assigned responsibility for the regulation of the design, manufacture, maintenance and materiel support of aeronautical products. This includes:

a. issuing technical airworthiness rules and standards within the limits of the authority assigned by the MND;

b. assigning technical airworthiness authority to organizations and individuals involved in the design, manufacture, maintenance and materiel support of aeronautical products;

c. ensuring only competent individuals are authorized to perform airworthiness-related activities;

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d. ensuring airworthiness-related activities are controlled and monitored through the audit and approval of processes and procedures used within organizations;

e. ensuring that the required facilities, equipment and personnel resources are available within organizations performing airworthiness-related activities;

f. performing the function of type certification authority for aeronautical products to ensure that type designs and proposed design changes to approved type designs are in compliance with the applicable airworthiness standards;

g. performing the function of DND/CAF aircraft registration authority;

h. ensuring aeronautical products are manufactured in conformance with the applicable approved type design;

i. granting flight authority to aircraft;

j. recommending, in co-ordination with the OAA, a Release to Service (RTS) for a new aeronautical product type;

k. monitoring in-service aeronautical products to ensure that manufacturing, maintenance and materiel support conform to the approved type design;

l. monitoring the usage of aeronautical products to ensure the role, missions and tasks conducted during in-service operation remain within the Statement of Operating Intent (SOI) and the design operating limits of the approved type design;

m. issuing, and where necessary, withdrawing DND/CAF aviation documents; and

n. acting as the technical member of the Airworthiness Advisory Board (AAB).

2. Technical activities and decisions that may have a significant effect on airworthiness take place over the entire life cycle of an aeronautical product from inception to disposal. Therefore, the Technical Airworthiness Program has been structured to follow the typical life cycle materiel management schedule of events from design initiation to product disposal, as shown in Figure 1-2-1-2.

3. **Design Initiation.** During this stage the airworthiness requirements for the particular aeronautical product type design are established. The applicable airworthiness design standards are selected for use in the development of the design.

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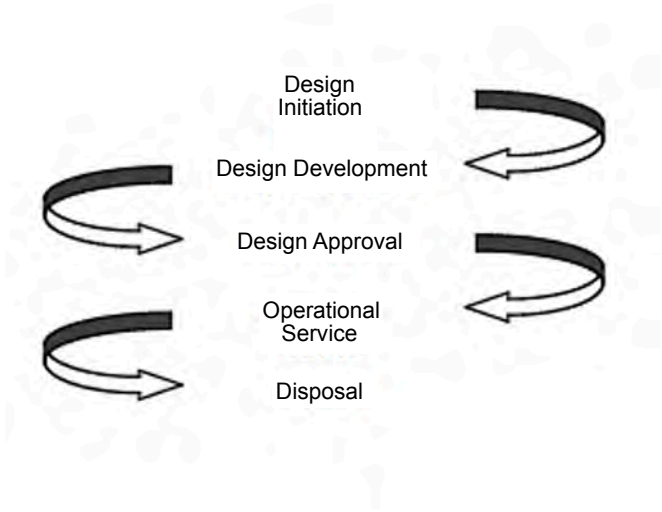

Figure 1-2-1-2 Product Life Cycle

4. **Design Development.** Development of the design consists of creating the actual design, demonstrating compliance with the applicable airworthiness design standards, documenting the design, producing the necessary operating procedures and developing the instructions for continued airworthiness.

5. **Design Approval.** Approval of a design may include many factors from aviation safety to financial resources to feasibility of implementation. From an airworthiness perspective, it includes airworthiness approval that involves making findings of compliance with the applicable airworthiness standards and Technical Airworthiness Clearance (TAC), which signifies that the approved type design is ready, from a technical perspective, to enter into operational service.

6. **Operational Service.** During operational service, airworthiness activity is at its peak with the operation and maintenance of the aeronautical product in accordance with the procedures and limits established in design development. In addition, any design changes initiated as a result of in-service problems or capability enhancements must consider the effects on the airworthiness of the product.

7. **Disposal.** Finally, when the aeronautical product enters the disposal stage of its life cycle, various decisions must be made regarding the method of disposal for the product and its associated spares because of the possible effects on the airworthiness of other products still in use.

8. To address airworthiness requirements in this broad spectrum of activities, the Technical Airworthiness Program is divided into three primary elements (initial airworthiness, continuing airworthiness and disposal) supported by a structured management framework as follows:

a. Initial airworthiness:

(1) airworthiness approval or type certification;

(2) aircraft registration;

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(3) manufacturing product conformance;

(4) granting flight authority; and

(5) technical airworthiness clearance.

b. Continuing airworthiness:

(1) conduct of maintenance;

(2) design change certification;

(3) in-service configuration management; and

(4) product usage monitoring.

c. Disposal

d. Management Framework:

(1) assignment of authority;

(2) airworthiness standards; and

(3) quality management system.

1.2.1.3 Initial Airworthiness

1. **Type Certification.** One of the conditions for an aeronautical product to be considered airworthy is that its type design must be in compliance with the appropriate airworthiness standards. The type certification process ensures compliance is adequately demonstrated, resulting in an approved type design.

2. As shown in Figure 1-2-1-3, type certification can occur as soon as all airworthiness requirements have been adequately met. This may include some performance, availability, reliability and maintainability requirements that are related to aviation safety, but does not necessarily include all aspects of these requirements. Therefore, type certification normally occurs prior to product qualification. In fact, an aeronautical product type design could be certified but never qualified due to a design deficiency which affects mission performance but has no aviation safety impact.

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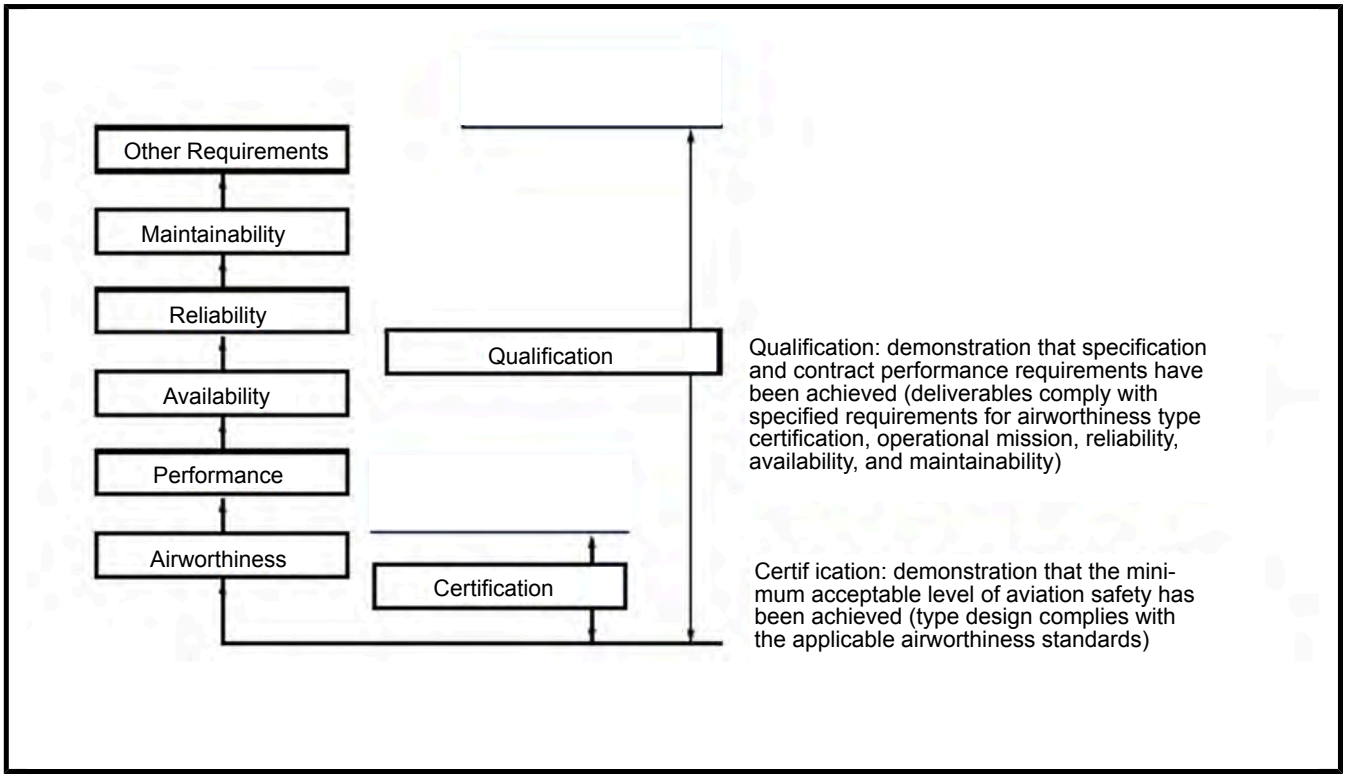

Figure 1-2-1-3 Certification and Qualification Comparison

3. The steps in the type certification process for a new aircraft type are as follows (a similar process exists for equipment):

a. **Statement of Operating Intent (SOI).** Before it can be determined which airworthiness standards should be applied to the design of an aircraft type, the conditions under which the aircraft type will be used must first be established. A Statement of Operating Intent (SOI) is produced by the intended users. The SOI must be in sufficient detail to permit an engineering assessment of the operating conditions and usage to enable the selection of appropriate airworthiness design standards;

b. **Certification Basis.**Based on the engineering assessment of the SOI for the aircraft type, the applicable airworthiness standards are identified. The collection of selected standards, known as the Certification Basis, is the airworthiness design goal for the particular aircraft type design;

c. **Compliance Program.** Compliance with the Certification Basis must be demonstrated through a series of analysis and test activities. The results of the compliance demonstration are recorded in a compliance record; and

d. **Type Certificate Issue.** Once all airworthiness issues and concerns have been addressed and compliance with the applicable airworthiness standards has been clearly demonstrated, the TAA will grant airworthiness approval to the type design. The TAA will then issue a Type Certificate for the approved type design. The approved type design is then the baseline for the manufacture of all required aircraft.

4. **Registration.** For aircraft, a requirement exists for the formal recording by the TAA of individual aircraft on the Military Aircraft Register and the assignment of a tail number. By international agreement, all aircraft in the world, whether military or civilian, must be recorded in only one register at a time. It is possible, however, to remove

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an aircraft from one register and place it in another provided the aircraft meets the conditions established by the receiving airworthiness regulatory agency.

5. **Product Conformance.** The airworthiness of all aeronautical products also depends upon the quality of the manufacturing process. A basic requirement is the need to produce a particular aeronautical product in conformance with the approved type design. The manufacturer issues a Conformance Certificate following production, inspection, and testing of each aeronautical product. The certificate is issued only if the aeronautical product conforms to the approved type design.

6. **Flight Authority.** For aircraft, another requirement is the granting of flight authority by the TAA through the issue of a Certificate of Airworthiness to each individual aircraft following the issue of the Type Certificate and the Conformance Certificate. Granting of flight authority is an airworthiness certification that the particular aircraft is in a condition for safe operation.

7. **Technical Airworthiness Clearance (TAC).** A TAC is issued by the TAA or an authorized individual, to declare that the technical requirements of the airworthiness program have been met and that, from a technical airworthiness perspective, the aeronautical product type (or a major design change to an existing type design) is ready to enter into operational service. A TAC is required before any new aircraft type is permitted to enter into operational service. A TAC is also required for all major design changes to an existing aircraft type prior to the release of the aircraft back into operational service. A TAC may be granted when the following requirements have been satisfied:

a. **Type Design.** The TAA has granted airworthiness approval to a new aeronautical product type design (Part 2, Chapter 1), or an authorized individual has approved a design change to an existing aeronautical product (Part 3, Chapter 2);

b. **Aeronautical Product.** This portion of the TAC specifically relates to an aeronautical product or aircraft fleet. For a new aircraft type, these requirements include the issuing of a Certification of Airworthiness (CofA) for each aircraft (Part 5, Chapter 7); the addition of the aircraft to the DND Military Aircraft Register; and the update of the technical record, including aircraft configuration documentation, to demonstrate fleet conformance to the approved design change (Part 5, Chapter 5); and

c. **In-service Support.** The appropriate in-service support arrangements are in place to ensure the continuing airworthiness of the aircraft type.

1.2.1.4 Continuing Airworthiness

1. Continuing airworthiness involves those activities necessary to ensure that aeronautical products continue to meet the appropriate airworthiness rules and standards throughout their operating life. Continuing airworthiness is an integral part of the day-to-day management and monitoring of an approved type design and the associated aeronautical products after a type certificate has been issued. Compliance with airworthiness standards during this in-service period ensures that the initial inherent safety of the approved type design and the actual aeronautical products are maintained throughout the product life cycle.

2. After a product enters operational service, the initial inherent level of safety can be degraded by:

a. normal operating wear;

b. maintenance and defect repairs;

c. design shortcomings;

d. changes in product utilization; and

e. exposure to severe operating environment.

3. **Conduct and Control of Maintenance.** To ensure continuing airworthiness throughout the service life of an aeronautical product, all maintenance must be conducted in accordance with the approved maintenance program. Furthermore, the maintenance must be conducted by authorized individuals within maintenance organizations

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that understand the potential impact of maintenance on the airworthiness of a product. This involves monitoring the maintenance program to ensure its effectiveness during actual service experience and proposing changes to accommodate approved modifications and other approved design changes.

4. **Design Change Certification.** Design change is the act of making, or the outcome from, a change to the approved type design of an aeronautical product. The control of the airworthiness aspects of a design change is critical to the preservation of airworthiness throughout the service life of an aeronautical product type. All design changes must follow a strictly controlled process. Therefore, like design, design changes require formal **airworthiness approval** and **TAC**.

5. Design changes include the following:

   a. a modification that involves a physical change to the approved configuration of an aeronautical product type;

   b. an alteration which may involve a change in design operating limits, clearance of stores for carriage on an aircraft or the change in functionality of an installed system;

   c. a change in the approved maintenance program including non-standard repairs; and

   d. a change in role, mission or task.

6. Most decisions regarding a change in the engineering data, spare parts, maintenance program and operating procedures will have an airworthiness aspect to them. An essential principle embedded in the Technical Airworthiness Program is as follows: ***The decision on whether or not airworthiness is a factor is an airworthiness decision in itself.*** A combination of experience and sound judgement must be applied to activities which may require an airworthiness-related decision.

7. **In-service Configuration Management.** The inherent airworthiness of in-service aeronautical products is contingent upon maintaining control over the approved type design and ensuring that products are in conformity with the approved type design. Furthermore, design changes will be required throughout the service life of an aeronautical product design to overcome design deficiencies and enhance product performance. These design changes are not necessarily implemented on all in-service products at the same time or in the same order. Therefore, it is necessary to implement configuration management of both the approved type design and in-service products to control the introduction of these approved design changes and to be able to verify the airworthiness status of each individual product at any time.

8. **Product Usage Monitoring.** Each aeronautical product type design is developed to meet a specific set of airworthiness standards applicable to the intended operational environment as stated in the SOI. The resulting approved type design has airworthiness limitations and design operating limitations associated with the specified operational environment and intended use of the aeronautical product. Assurance of continuing airworthiness during in-service usage requires the product to be operated within the design operating and airworthiness limitations. Furthermore, usage monitoring and assessment throughout operational service are essential to ensure the target safety level achieved during the type certification process is maintained.

1.2.1.5 Disposal

1. The disposal of aeronautical products is an important aspect in any airworthiness program. The disposal element of the Technical Airworthiness Program has been developed to ensure non-conforming materiel does not find its way back into the supply inventory. This requires the incorporation of effective disposal procedures into the materiel management processes for aeronautical products.

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1.2.1.6 Management Framework

1. The management framework for the Technical Airworthiness Program is based on three key building blocks as follows:

a. a formal and structured system for the assignment of technical airworthiness authority by the TAA to organizations and individuals;

b. TAA-accepted airworthiness standards; and

c. a quality management system acceptable to the TAA that ensures airworthiness-related activities are performed in accordance with approved procedures.

2. **Assignment of Authority.** A formal and structured system is provided in Part 1, Chapter 4, for the controlled assignment of technical airworthiness authority to organizations and individuals. For organizations, the process is known as **airworthiness accreditation/recognition**, a requirement to be deemed an Acceptable Organization by the TAA**.** For individuals, the process varies somewhat depending on whether the individual is assigned technical airworthiness authority directly by the TAA or by an authorized individual within an Acceptable Organization. Technical airworthiness authority assigned to an individual directly by the TAA is known as a **designation.** Technical airworthiness authority assigned to an individual by an authorized individual is known as an **authorization**.

3. **Airworthiness Standards.** To ensure an acceptable level of aviation safety, the Technical Airworthiness Program requires that the design, manufacture, maintenance and materiel support of aeronautical products be accomplished in accordance with the applicable airworthiness standards. These airworthiness standards are issued or accepted by the TAA as either program-related airworthiness standards or product-related airworthiness standards. Program-related airworthiness standards are normally published in the TAM with the technical airworthiness rule that directs the airworthiness requirement. Product-related airworthiness standards are normally published in the TAA-issued Airworthiness Design Standards Manual (ADSM).

4. **Quality Management System.** An effective quality management system is one of the primary means used to ensure that the various airworthiness-related activities are performed in accordance with approved procedures. Organizations seeking TAA airworthiness accreditation or recognition for the design, manufacture, maintenance and materiel support of aeronautical products must implement a quality management system evaluated against a quality standard acceptable to the TAA. All organizations whose mission/function requires the assignment of technical airworthiness authority must implement a quality management system prior to obtaining airworthiness accreditation by the TAA.

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PART 1
MANAGEMENT FRAMEWORK

CHAPTER 3 - TECHNICAL AIRWORTHINESS PROGRAM FEATURES

SECTION 1

INTRODUCTION

1.3.1.1 Program Features

1. A number of features or concepts have been incorporated into the Technical Airworthiness Program to ensure an acceptable level of aviation safety is achieved and maintained for aeronautical products and to facilitate implementation of the program. These features are discussed in this chapter and include the following:

a. a formal document hierarchy;

b. a rule-making process;

c. a clear definition of airworthiness-related activities;

d. the concept of technical airworthiness functions to control specific airworthiness-related tasks;

e. the concept of airworthiness review to support the technical airworthiness functions;

f. defined airworthiness responsibilities related to the organizational roles of the Design Authority (DA) and Type Certificate Holder (TCH);

g. the concept of Design Support Network (DSN); and

h. defined technical airworthiness processes.

1.3.1.2 Document Hierarchy

1. The Technical Airworthiness Program uses a formal document hierarchy to provide a logical flow of technical airworthiness requirements with a firm legal basis as follows:

a. ***Aeronautics Act.*** Provides the legal foundation for the entire program;

b. **Aeronautics Regulations.** Amplify provisions of the ***Aeronautics Act.*** (Issued by the Governor-in-Council as laws of Canada);

c. **Ministerial Orders.** Provide policy direction for the creation, implementation and operation of the DND/CAF Airworthiness Program and specific direction regarding airworthiness. (Issued by the MND);

d. **DND/CAF Airworthiness Policy.** Outlines the DND/CAF Airworthiness Program requirements, airworthiness regulatory responsibilities and key program definitions. (Issued by the Chief of Defence Staff (CDS) and the Deputy Minister (DM) as a Defence Administrative Orders and Directives (DAOD));

e. **Technical Airworthiness Rules.** Amplify as necessary the Airworthiness Policy, ministerial orders and aeronautics regulations and assist in implementation. Also provide direction on specific aspects of the Technical Airworthiness Program in the design, manufacture, maintenance and materiel support of aeronautical products. Technical airworthiness rules are either program-related rules or product-related rules. They may either be temporary or permanent in nature. Program-related rules are normally published in the Technical Airworthiness Manual or may be issued by other means, such as letter, message or fax, when it is deemed necessary for immediate action. Product-related rules are issued as a TAA Airworthiness Directive (AD) in accordance with Part 5, Chapter 6. (Issued by the TAA under the airworthiness authority delegated to the TAA by the MND);

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f. **Technical Airworthiness Standards.** Provide program-related or product-related standards, airworthiness design requirements and/or measurement criteria to assure compliance with technical airworthiness rules, as described in Part 1, Chapter 5. Technical airworthiness standards are not direction in their own right. They are only applicable when directed by a technical airworthiness rule or included in a Certification Basis of an aeronautical product type design as required by a technical airworthiness rule. (Issued by the TAA);

g. **Advisory Material.** Provides interpretation of technical airworthiness rules and standards to assist in understanding and implementation. Also provides guidance on methods and procedures that are in compliance with technical airworthiness rules and standards. Advisory material is not mandatory and organizations may choose to follow other means of demonstrating compliance. (Issued by the TAA);

h. **Approved Processes.** Describe how an organization will comply with the applicable technical airworthiness rules and standards. (Developed by the organization, approved by the TAA and issued by the organization); and

i. **Approved Procedures.** Describe how a particular activity will be performed within an Acceptable Organization. (Issued by an organization after the TAA-designated individual responsible for the airworthiness-related activities of the organization assesses their compliance with the TAA-approved processes).

1.3.1.3 Rule Making Process

1. A formal rule making process has been established within the Technical Airworthiness Program to ensure all airworthiness requirements included in technical airworthiness rules and/or standards are reasonable and applicable prior to issue. The process, as depicted in Figure 1-3-1-1, involves three basic stages as follows:

a. **Development.** This stage involves determining the requirement for a technical airworthiness rule and/or standard, reviewing existing rules and standards issued by other airworthiness regulatory authorities and drafting the necessary documents that direct **what** is required from a technical airworthiness perspective;

b. **Consultation.** The draft technical airworthiness rule and/or standard is provided to the various stakeholders for review and comment. Consultation enables the applicable organizations and personnel involved to review a proposed technical airworthiness rule and/or standard prior to issue by the TAA. The purpose of the review is to assess the applicability of the proposed rule and/or standard and the feasibility of implementation prior to mandatory compliance. Consultation will be used wherever possible for all new rules and/or standards and any changes to existing rules and standards. However, the TAA may issue a technical airworthiness rule and/or standard without consultation if urgent action is considered essential or immediate issue is in the best interests of DND and the CAF.

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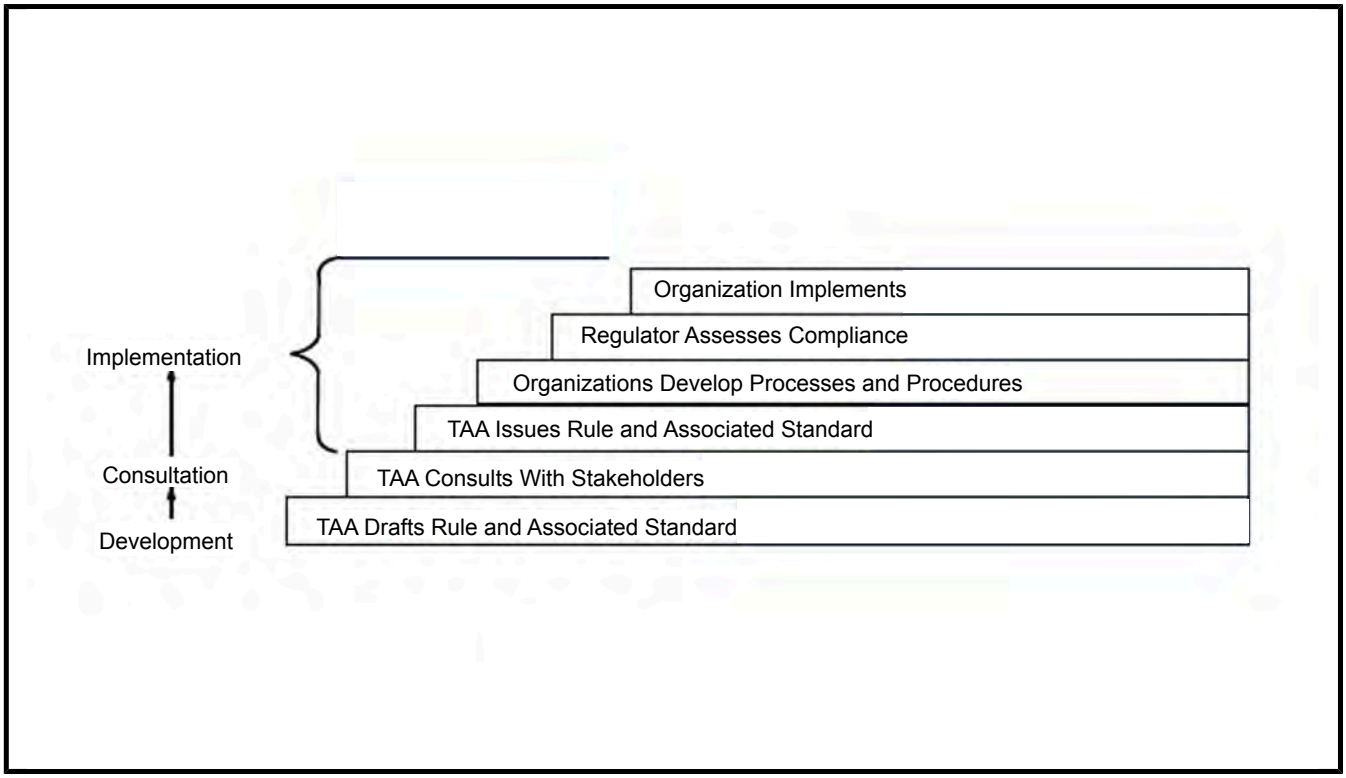

Figure 1-3-1-1 Rule Making

c. **Implementation.** The draft technical airworthiness rules and/or standards are revised as necessary based on the consultation with stakeholders and issued by the TAA. Compliance by all affected organizations, personnel and equipment is mandatory unless the TAA approves otherwise, as discussed in the next paragraph. Organizations then develop or amend any airworthiness processes and/or associated organizational procedures that describe **how** the organization will comply with the technical airworthiness requirements. The TAA assesses compliance and approves the affected airworthiness processes. The organizations then implement the processes and the associated procedures.

2. **Compliance.** Normally a new technical airworthiness rule and/or standard or a change to an existing rule or standard will be issued with a statement regarding applicability, the means of compliance and the time for compliance. Compliance with technical airworthiness rules and/or standards is mandatory for all personnel, organizations and equipment affected unless the TAA approves an exemption, an alternative means of compliance or a compliance extension. An exemption, alternative means of compliance or a compliance extension may only be granted by the TAA. An exemption normally requires demonstration that the exemption:

a. will not degrade the safe operation of an aeronautical product;

b. is justified in a manner acceptable to the TAA; and

c. is in the interests of DND and the public.

1.3.1.4 Airworthiness-related Activities

1. Within the Technical Airworthiness Program, airworthiness-related activities include any duties, tasks or functions that may affect the airworthiness of an aeronautical product. This includes:

a. airworthiness-related tasks as described in 1.3.1.5;

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b. specific airworthiness-related roles assigned to personnel or organizations as described in 1.3.1.6; and

c. technical airworthiness functions as described in 1.3.1.7.

1.3.1.5 Airworthiness-related Tasks

1. An airworthiness-related task is work that may affect airworthiness, performed on or in support of an approved type design or aeronautical product. The Technical Airworthiness Program requires that an airworthiness-related task be performed by authorized personnel and in accordance with approved procedures. A few examples of airworthiness-related tasks performed in the design, manufacture, maintenance or materiel support of aeronautical products are shown in Figure 1-3-1-2.

1.3.1.6 Airworthiness-related Roles

1. The Technical Airworthiness Program introduces airworthiness-related responsibilities associated with specific roles that are assigned to personnel or organizations in order to assure the airworthiness of aeronautical products. These roles include:

a. **Airworthiness Management Roles.** Those management roles within an organization assigned in accordance with Part 1, Chapter 4, to individuals who are responsible to ensure that the organization complies with the applicable airworthiness rules and standards during the design, manufacture, maintenance and materiel support of aeronautical products;

b. **Type Certificate Holder.** The role assigned to an organization to perform the responsibilities as described in Part 2, Chapter 1, and in paragraph 1.3.1.9.5., where the aeronautical product has been placed on the DND Aircraft Register; and

c. **Design Authority.** The role associated with the aircraft or aeronautical product original equipment manufacturer (OEM), to perform the responsibilities as described in 1.3.1.9.3.

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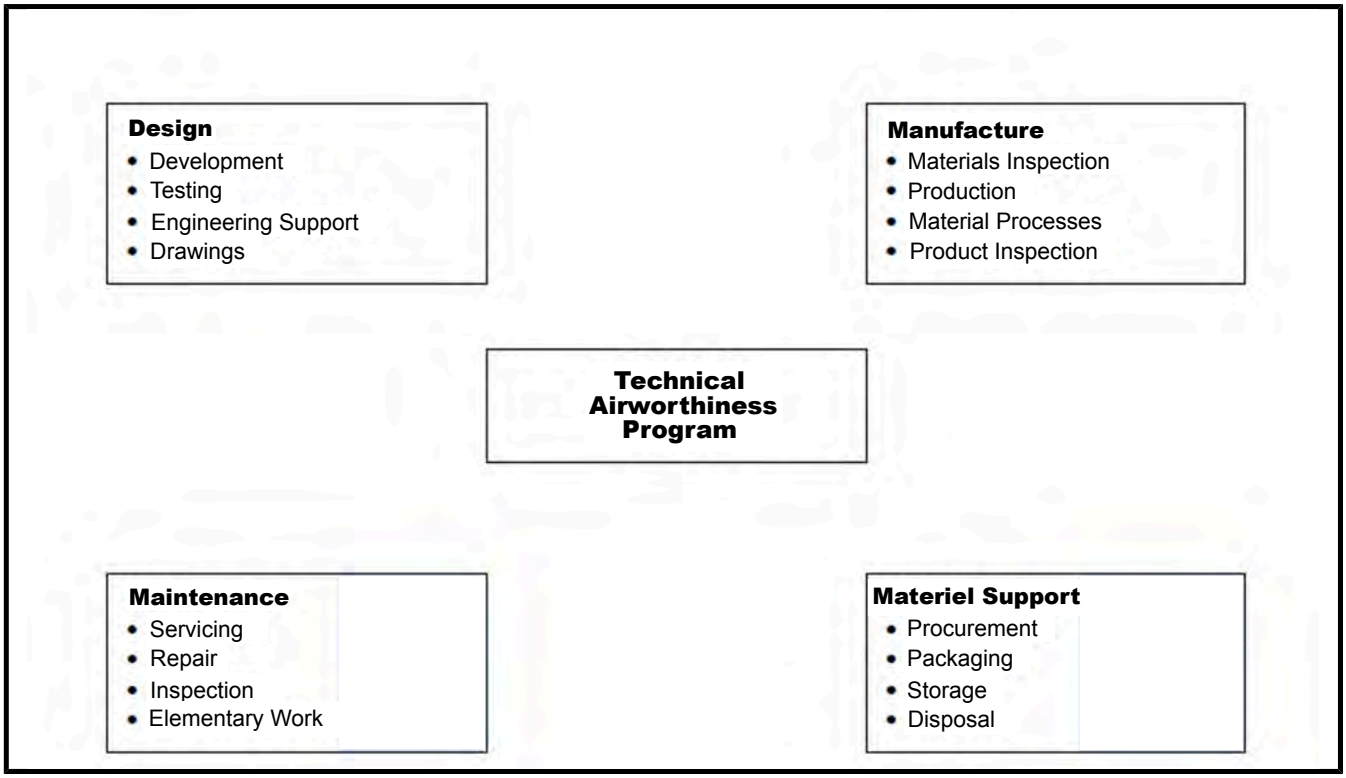

Figure 1-3-1-2 Airworthiness-related Tasks

1.3.1.7 Technical Airworthiness Functions

1. The technical airworthiness functions shown in Figure 1-3-1-3 and described in the following paragraphs have been established within the Technical Airworthiness Program to enable an airworthiness certification to be performed upon completion of an airworthiness-related task when directed by a technical airworthiness rule or standard. There is a direct link between these technical airworthiness functions and the responsibilities assigned by the MND to the TAA as a delegated airworthiness authority. Individuals perform these technical airworthiness functions on behalf of the TAA when they have been assigned technical airworthiness authority either directly by the TAA or by an authorized individual within an organization deemed acceptable by the TAA.

2. **Finding of Compliance.** A finding of compliance is certification that a specific element of a type design or a proposed design change to an approved type design complies with the applicable requirements in the Certification Basis. An individual may be assigned technical airworthiness authority to make findings of compliance directly by the TAA or by an authorized individual in an Acceptable Organization, in accordance with Part 1, Chapter 4. In addition, an individual may be authorized to make a specific finding of compliance as part of a compliance program in accordance with Part 2, Chapter 1, for a new type design or Part 3, Chapter 2, for a proposed design change to an approved type design. In summary, a finding of compliance certifies that:

a. the airworthiness design standard for the specific requirement is appropriate;

b. the means of demonstrating compliance is appropriate; and

c. the proof of compliance is adequate.

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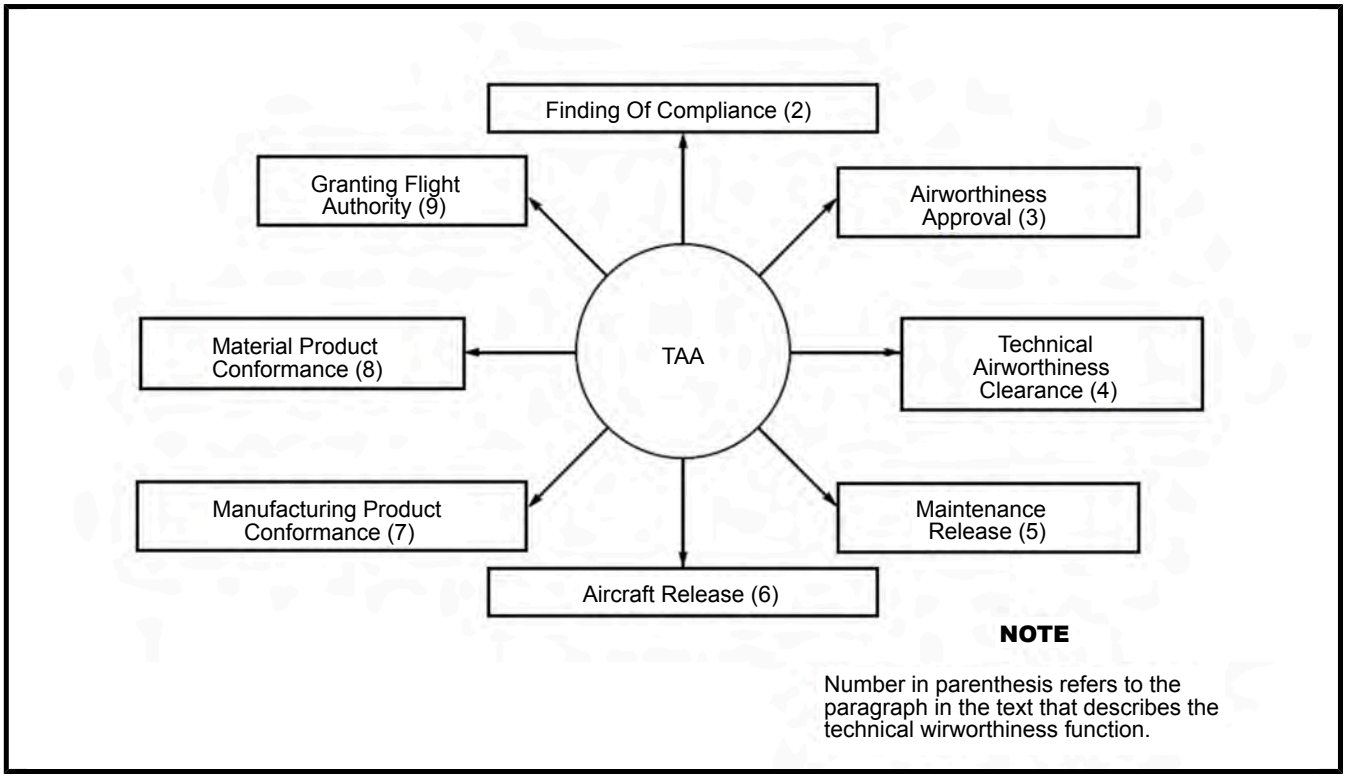

Figure 1-3-1-3 Technical Airworthiness Functions

3. **Airworthiness Approval.** Airworthiness approval is certification that a type design or proposed design change to an approved type design is in compliance with the applicable airworthiness standards in the Certification Basis. An airworthiness approval may require several authorized individuals to make findings of compliance for specific airworthiness requirements in the Certification Basis. Airworthiness approval of a new type design that will result in the issue of a DND Type Certificate is normally only granted by the TAA. An individual may be assigned technical airworthiness authority to grant airworthiness approval directly by the TAA or by an authorized individual in an Acceptable Organization, in accordance with Part 1, Chapter 4. Airworthiness approval is performed in accordance with Part 2, Chapter 1, for a new type design and Part 3, Chapter 2, for a proposed design change to an approved type design. In summary, an airworthiness approval certifies that:

a. the Certification Basis is appropriate;

b. the means of demonstrating compliance are appropriate;

c. the proof of compliance supporting the findings of compliance are adequate; and

d. authorized individuals made each finding of compliance.

4. **Technical Airworthiness Clearance (TAC).** A TAC is issued by the TAA, or an authorized individual, to declare that the technical requirements of the airworthiness program have been met and that, from a technical airworthiness perspective, the aeronautical product type (or a major design change to an existing type design) is ready to enter into operational service. The TAC of a new type design that will result in a recommendation of Airworthiness Clearance in coordination with the OAA will only be granted by the TAA. In all other situations, the TCH is responsible to ensure that an authorized individual within the TCH organization or their DSN grants TAC. The TAC is performed in accordance with Part 2, Chapter 3. The TAC is combined with an Operational Airworthiness

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Clearance (OAC) to provide an Airworthiness Clearance for an aeronautical product type. In summary, a TAC certifies that:

a. the design or proposed design change has received an airworthiness approval

b. the approved maintenance program for the aeronautical product type is acceptable to the TAA;

c. the type design or design change has been recorded in the type design documentation; and

d. the engineering, maintenance and materiel support arrangements to assure continuing airworthiness of in-service aeronautical products are acceptable to the TAA.

5. **Maintenance Release.** A maintenance release is certification that an aeronautical product is in conformance with the applicable approved type design following the performance of maintenance, including a maintenance task or a modification embodiment. The performance of maintenance on an aeronautical product is part of the conduct of maintenance as described in Part 3, Chapter 1. In summary, a maintenance release certifies that:

a. the maintenance task was completed in accordance with the approved maintenance program or the modification was embodied in accordance with the approved modification instruction;

b. no outstanding work remains or an appropriate entry has been made in the applicable Technical Record; and

c. the entries in the Technical Record relating to the work performed are correct.

6. **Aircraft Release.** An aircraft release is certification that an aircraft is in conformance with the applicable approved type design following the performance of maintenance, servicing or elementary work and is safe for release to operations as described in Part 3, Chapter 1. In summary, an aircraft release certifies that:

a. a maintenance release for all required maintenance tasks and/or modification embodiments has been signed by an authorized individual;

b. the flight authority for the aircraft is still valid in that the aircraft has been maintained in accordance with the approved maintenance program, or a new flight authority has been issued by an authorized individual; and

c. all scheduled maintenance required by the approved maintenance program has been accomplished.

7. **Manufacturing Product Conformance.** Manufacturing product conformance is certification, in accordance with Part 5, Chapter 4, that a newly manufactured aeronautical product is in conformance with the applicable approved type design. In summary, a manufacturing product conformance certifies that:

a. the item was inspected in accordance with the organization's approved procedures;

b. the item conforms to the applicable approved type design and is in a condition for safe operation; and

c. the manufacturing and inspection records are correct.

8. **Material Product Conformance.** Material product conformance is certification that an aviation replacement part conforms to the applicable approved type design and is traceable to a manufacturer acceptable to the TAA, in accordance with Part 5, Chapter 2. In summary, a material product conformance certifies that:

a. the proof of conformity and traceability evidence are adequate;

b. the item was inspected in accordance with the organization's approved procedures; and

c. the item was manufactured by an organization acceptable to the TAA.

9. **Granting of Flight Authority.** Granting of flight authority is certification in accordance with Part 5, Chapter 7, that an aircraft is airworthy in that it is in condition for safe operation. This includes the initial flight authority granted

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through the issue of a Certificate of Airworthiness following manufacture of a new aircraft, and temporary flight authority granted through the issue of a flight permit for engineering flight tests and other special purposes. In summary, granting of full flight authority certifies that:

a. the aircraft type design, including all incorporated design changes, has received airworthiness approval;

b. the aircraft conforms to the applicable approved type design; and

c. the aircraft is in a condition for safe operation.

ADVISORY NOTE

The publication C-05-020-007/AM-000 - Policy and Procedures - Flight Test Orders for the Canadian Forces- *defines the DND policy and requirements for flight test and evaluation, as well as related ground testing items that are subject to the requirements of the* DND/CAF Airworthiness Program *by or on behalf of the CAF.*

1.3.1.8 Airworthiness Review

1. Airworthiness review is not a formal technical airworthiness function but is a feature built into the Technical Airworthiness Program. This feature enables an examination by independent and competent personnel to ensure all airworthiness aspects have been adequately addressed prior to a decision. Airworthiness review may also be used as a training tool to develop personnel for the future assignment of technical airworthiness authority to perform technical airworthiness functions on behalf of the TAA. In this regards, it provides an opportunity to assess the competency of an individual to perform a technical airworthiness function.

2. The requirement for conducting an airworthiness review is left to the judgement of the individual who is conducting the technical airworthiness function, whether it is making a finding of compliance, granting airworthiness approval, or granting technical airworthiness clearance. In some circumstances, it may also be appropriate to conduct an airworthiness review prior to certifying maintenance release, aircraft release, product conformance or granting flight authority. In judging whether an airworthiness review is appropriate, the individual who conducts the technical airworthiness function should consider factors such as self-assessed competency in the particular situation, complexity of the airworthiness requirements, criticality, impact on the airworthiness of the aeronautical product and the number of disciplines involved.

3. Airworthiness review should not be confused with the review or verification processes associated with the conduct of the activity, such as design verification, preliminary design review, critical design review or maintenance verification. The airworthiness review may be conducted concurrently, but its specific purpose is to review the airworthiness requirements associated with the final decision in the performance of a technical airworthiness function. The conduct of an airworthiness review may be assigned to an individual external to the organization, provided that the individual is assessed as competent. The individuals conducting airworthiness review do not require technical airworthiness authority. To meet the independence requirement, the personnel conducting the airworthiness review shall not have participated in the activity leading up to the required decision. For a complex situation, such as a major design change involving several integrated systems, the airworthiness review may be progressive and involve more than one engineering discipline. In this case, competent individuals from each discipline should be involved in the airworthiness review.

1.3.1.9 Organizational Roles

1. To ensure the airworthiness of in-service aeronautical products is maintained throughout their operational service, the airworthiness responsibilities related to the organizational roles of the Design Authority (DA) and the Type Certificate Holder (TCH) have been established within the Technical Airworthiness Program.

2. **Design Authority (DA).** The DA for an aeronautical product is the organization that has the in-depth technical competency and comprehensive technical data related to the approved type design. The DA is normally the only organization capable of performing a full assessment of the design and thus providing or recommending airworthiness approval for any subsequent design changes. If the organization created the original type design, then

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the DA is often referred to as the original equipment manufacturer (OEM) for the specific aeronautical product. The DA for an aeronautical product will normally be either accredited as an Acceptable Design Organization (ADO) or recognized by the TAA in accordance with Part 1, Chapter 4.

3. **Design Authority's Responsibilities.** The DA's airworthiness-related responsibilities for the approved type design of an aeronautical product are as follows:

a. maintain the capability to fully assess all airworthiness aspects of the approved type design and any subsequent design changes;

b. hold and maintain basic data used in design and also maintain authority over the optimum interpretation of these data;

c. hold and maintain the documentation describing the functional and physical characteristics of the design;

d. ensuring the type, source and quality of those items supplied by a vendor for incorporation into the design of an aeronautical product are chosen to assure the airworthiness of the aeronautical product;

e. monitor the behaviour of an approved type design under operating conditions, and recommend any necessary changes to the approved maintenance program for the aeronautical product;

f. monitor the behaviour of an approved type design under operating conditions, and upon recognizing design deficiencies, take action to develop a design change; and

g. provide support to the TCH for the aeronautical product.

4. **Type Certificate Holder (TCH).** The TCH is the organization accountable to the TAA for ensuring that, when placed on the DND Aircraft Register, the aeronautical product meets all continuing airworthiness requirements stipulated in the TAM. This normally involves the management of the in-service engineering support, maintenance support, materiel support and disposal of aeronautical products. The TCH is normally the only organization with sufficient visibility and control over all aspects of an aeronautical product's design, manufacture, maintenance and materiel support to provide TAC for a design change to an approved type design. A TCH for an aeronautical product would normally require accreditation or recognition by the TAA as an Acceptable Technical Organization (ATO) in accordance with Part 1, Chapter 4.

5. **Type Certificate Holder's Responsibilities.** The TCH's airworthiness-related responsibilities for the approved type design of an aeronautical product are as follows:

a. ensure the establishment, maintenance and availability to the TAA of a Type Record and Technical Record;

b. monitor aeronautical products in service and report airworthiness-related issues to the TAA;

c. ensure that the rectifications of the unsafe conditions and/or type design capability enhancements are accomplished through the implementation of the appropriate design change, including changes to MEL/MMEL and changes to AOI;

d. report and staff for TAA approval any amendments to the data shown in the Type Certificate Data Sheet;

e. manage airworthiness risks identified during the operational service of the type design;

f. ensure that the configuration management of the type design is established and maintained; and

g. establish and maintain the arrangements with TAA-accredited or TAA-recognized organizations in order to provide the required engineering, logistic and maintenance support to maintain the airworthiness of the type design.

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1.3.1.10 Design Support Network (DSN)

1. A DSN is a formal network of organizations acceptable to the TAA established to support the designated TCH for an aeronautical product. To be included in a DSN, an organization would normally require accreditation or recognition by the TAA in accordance with Part 1, Chapter 4. The purpose of the DSN is to provide the TCH with direct access to the required design-related technical airworthiness functions over the complete approved type design for an aeronautical product. This network of organizations must be capable of providing airworthiness approval, TAC and grant flight authority for the aeronautical product type design and proposed design changes, including all associated systems, equipment and components within the scope and depth of airworthiness authority assigned by the TAA. A typical DSN is depicted in Figure 1-3-1-4.

1.3.1.11 Airworthiness Processes

1. Various processes are incorporated into the Technical Airworthiness Program to ensure an acceptable standard of aviation safety is achieved for military aviation in Canada and also to assist in the operation of the program. These processes include:

a. controlled acceptance of technical airworthiness risk;

b. controlled procurement of aviation replacement parts and materials;

c. a process for the development of an approved maintenance program;

d. controlled manufacture of aeronautical products;

e. controlled airworthiness-related documentation throughout the life cycle of an aeronautical product;

f. a process for the issue of TAA Airworthiness Directives;

g. controlled granting of flight authority to aircraft; and

h. defined identification requirements for aeronautical products.

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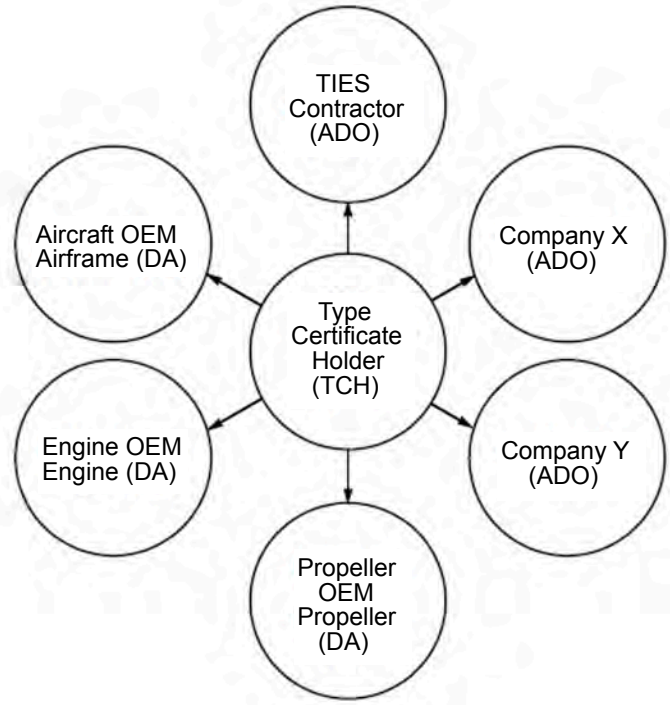

Figure 1-3-1-4 Design Support Network (DSN)

2. **Technical Airworthiness Risk Management.** Since conflicts will always exist between aviation safety, mission accomplishment and resource expenditure, a process has been established to assess and manage the safety risk associated with airworthiness-related decisions and technical airworthiness functions. The technical airworthiness risk management process, as described in Part 5, Chapter 1, incorporates the five basic elements of hazard identification, risk assessment, risk control plan, risk acceptance and risk tracking.

3. **Aviation Replacement Parts Procurement.** Aviation replacement parts and materials are required to support the in-service maintenance and manufacture of aeronautical products. To ensure that all parts and materials intended for use on an aeronautical product are approved parts, a process, as described in Part 5, Chapter 2, has been established within the Technical Airworthiness Program for the procurement and control of aviation replacement parts.

4. **Approved Maintenance Program.** The approved maintenance program for an aeronautical product specifies the maintenance activities including the technical and administrative actions necessary to keep an aeronautical product and associated systems, equipment, component parts and software, in a fit and safe condition for flight. In addition to airworthiness, maintenance activities for an aeronautical product may originate from a variety of reasons, including availability, mission effectiveness, life expectancy, standardization and organizational. To ensure the minimum essential maintenance is accomplished to assure the continued airworthiness of an aeronautical product in-service, a process, as described in Part 5, Chapter 3, has been established within the Technical Airworthiness Program for the development and control of the approved maintenance program. This process ensures the Instructions for Continued Airworthiness, including the TAA-approved airworthiness limitations that are established during the Type Certification of an aeronautical product, are adequately incorporated into the approved maintenance program. In addition, Part 5, Chapter 3, requires that a satisfactory method be implemented to control changes to the approved maintenance program.

5. **Manufacture of Aeronautical Products.** An aeronautical product can only be considered airworthy if all equipment, appliances and associated components were manufactured in conformance with the applicable

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approved type design. Therefore, the Technical Airworthiness Program establishes airworthiness requirements for the manufacture of aeronautical products and aviation replacement parts, including the local manufacture of parts during the maintenance of an aeronautical product. The requirements, as described in Part 5, Chapter 4, include:

a. manufacturers acceptable to the TAA;

b. a manufacturing control system; and

c. airworthiness certification of product conformance for all newly manufactured aeronautical products and associated parts.

6. **Airworthiness Documentation.** To provide traceability for airworthiness-related decisions and actions, requirements have been established for the production, control and retention of airworthiness-related documentation. Appropriate retention periods have been established for airworthiness-related documents. In a few cases, the documents must be retained and available for as long as the aeronautical product remains in service. The airworthiness documentation requirements of the Technical Airworthiness Program, as described in Part 5, Chapter 5, ensures that the necessary airworthiness-related information is retained for future reference. This includes requirements for:

a. a Type Record which includes design-related documentation, such as design description, compliance record and design changes;

b. a Technical Record which includes product-related documentation, such as configuration status and maintenance records; and

c. an Organizational Record which includes organization-related documentation, such as approved processes and procedures, organization accreditation-related documents and personnel records.

7. **Airworthiness Directives (AD).** An AD may be issued by the TAA in situations when mandatory action is necessary to rectify a potential degradation in the level of safety for in-service aeronautical products, as described in Part 5, Chapter 6. An AD may be permanent or temporary in nature to address a design deficiency or product technical problem. Compliance with a TAA-issued AD is mandatory for all affected aeronautical products unless the TAA grants an exemption, an alternative means of compliance or a compliance extension. The Technical Airworthiness Program also recognizes an AD or equivalent notice issued by another airworthiness authority that is applicable to an aeronautical product used on a DND-registered aircraft.

8. **Flight Authority.** The granting of flight authority to an aircraft, as described in Part 5, Chapter 7, is the means used within the Technical Airworthiness Program to ensure all airworthiness compliance and conformance requirements have been satisfied prior to flight of an aircraft. Provisions have been established for the issue of a flight permit to authorize the flight of an aircraft when full compliance or conformance cannot be adequately demonstrated. An initial flight authority granted to an aircraft with the issue of a Certificate of Airworthiness remains valid as long as compliance and conformance is maintained for the particular aircraft. Compliance is maintained by the airworthiness approval and/or acceptance of all proposed design changes to the approved type design. Conformance is maintained by:

a. maintaining the aircraft in accordance with the approved maintenance program; and

b. incorporating all modifications in accordance with the approved modification instructions.

9. **Identification of Aeronautical Products.** Identification requirements as described in Part 5, Chapter 8, have been incorporated within the Technical Airworthiness Program to provide control and traceability during the procurement, manufacture, installation and maintenance of aeronautical products. Aircraft, engines, propellers, life-limited components and aircraft appliances require the manufacturer's name, model designation, type certificate and serial number to be included on an identification plate or by some other suitable means. Other aeronautical products must be identified with the part number, as indicated in the applicable approved type design, and the manufacturer's identification. In certain situations, such as the local manufacture of aviation replacement parts, a unique number other than the part number must be used.

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SECTION 2

RULES AND STANDARDS (NOT ALLOCATED)

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SECTION 3

ADVISORY MATERIAL (NOT ALLOCATED)

NOTE

In an effort to provide Advisory Material to TAM users as rapidly as possible, all applicable Advisory Material will be published in the form of TAA Advisories, and will be posted on the DTAES websites, which are updated regularly.

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PART 1
MANAGEMENT FRAMEWORK

CHAPTER 4 - ASSIGNMENT OF TECHNICAL AIRWORTHINESS AUTHORITY

SECTION 1

INTRODUCTION

1.4.1.1 Background

1. The *Aeronautics Act* assigns the Minister of National Defence (MND) powers, duties and responsibilities for military aviation safety in Canada, including the power to delegate authority. To achieve and maintain an acceptable level of aviation safety, the design, manufacture, maintenance, and materiel support of aeronautical products must be conducted by competent individuals working in capable organizations. Therefore, the MND has delegated authority for the technical aspects of military aviation safety to the Technical Airworthiness Authority (TAA), including the responsibility for the assignment of technical airworthiness authority to organizations and individuals involved in the design, manufacture, maintenance, and materiel support of aeronautical products. In this regard, the TAA has established a formal system within the Technical Airworthiness Program (TAP) for the controlled assignment of technical airworthiness authority to organizations and individuals.

2. This chapter contains the rules, standards and advisory material issued by the TAA for the controlled assignment of technical airworthiness authority to organizations and individuals, with the exception of TAA regulatory staff. The TAA regulatory staff is assigned technical airworthiness authority in accordance with an internal TAA-approved procedure.

3. Several TAP key concepts and definitions discussed in Part 1, Chapters 2 and 3, are important to the understanding of this chapter. The reader should be familiar with the concepts and terminology introduced in these chapters.

1.4.1.2 Assignment of Technical Airworthiness Authority to Organizations

1. Technical airworthiness authority is required by an organization involved in the design, manufacture, maintenance and materiel support of aeronautical products, and whose personnel perform an airworthiness management role and/or a technical airworthiness function on behalf of the TAA.

2. **Airworthiness Management Role.** Airworthiness management roles within an organization are assigned to the individuals who are responsible to ensure that the organization complies with the applicable airworthiness rules and standards during the conduct of airworthiness-related activities. As described in 1.3.1.4, airworthiness-related activities are all duties, tasks and functions performed within an organization that may affect the airworthiness of an aeronautical product. For examples of airworthiness management roles, refer to 1.4.1.5.

3. **Technical Airworthiness Function.** A technical airworthiness function is a mandatory airworthiness certification performed by an authorized individual on behalf of the TAA, as required by the applicable airworthiness rules and standards, in the conduct of airworthiness-related activities. Technical airworthiness functions are described in more detail in Part 1, Chapter 3, and include:

a. Finding of compliance;

b. Airworthiness Approval;

c. Technical Airworthiness Clearance (TAC);

d. Granting of Flight Authority;

e. Aircraft Release;

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f. Maintenance Release;

g. Manufacturing Product Conformance; and

h. Materiel Product Conformance.

4. The scope and depth of technical airworthiness authority assigned to an organization is based on the capability of the organization, the competency of personnel available to the organization and the authority required to satisfy the objectives of the organization. Organizational authority is assigned by the TAA through the ***organizational acceptance*** process described in this chapter.

5. Not all organizations conducting airworthiness-related activities require TAA approval. An organization does not normally require TAA approval (i.e., recognition or accreditation) if:

a. completion of the airworthiness-related activity does not require an airworthiness management role or a technical airworthiness function to be performed on behalf of the TAA by the organization's personnel; and

b. the activity is performed under the control of a TAA-acceptable organization, and the required technical airworthiness functions will be performed by personnel from that organization.

1.4.1.3 Organizational Airworthiness Acceptability

1. Airworthiness Acceptability of an organization by the TAA provides the technical airworthiness authority required for the organization to perform its assigned airworthiness management roles and technical airworthiness functions in the conduct of airworthiness-related activities. In order to achieve Acceptability, organizations must either obtain Accreditation or achieve Recognition. Accreditation and Recognition permit organizations to assign technical airworthiness authority to competent individuals who perform airworthiness management roles and who conduct technical airworthiness functions within the organization. Organizations are deemed Accredited when they have demonstrated compliance with the applicable requirements of the Technical Airworthiness Manual (TAM). Organizations are deemed Recognized when they have demonstrated compliance with a TAA-approved combination of TAM and supplementary airworthiness requirements. Subject to TAA approval, TAA staff regularly accepts other civil regulatory agency requirements, when combined with TAM requirements, to formulate the Organizational Recognition requirements framework. Organizations should contact TAA staff to determine their eligibility for Recognition.

2. Organizations that intend to seek TAA Organizational Acceptability should consult with the TAA as early as possible prior to submission of the formal application. To be eligible for TAA Organizational Acceptability, an organization must meet the criteria listed in 1.4.2.S1.

3. The Airworthiness Process Manual (APM) is the primary means for the organization to document its compliance with airworthiness rules and standards in the TAM. The APM must describe the processes utilized by the organization to govern the performance of airworthiness-related activities and define the scope and depth of technical airworthiness authority assigned to the organization by the TAA. The APM produced by a Recognized Organization is called a DND Airworthiness Supplement (DAS), and must cover the residual TAM requirements and bridge the gap between the Organization's existing policy and its application for DND.

4. Airworthiness Acceptability of an organization is based on audit concepts and principles. It consists of an initial in-depth review and an ongoing monitoring of the airworthiness-related processes of an organization. The goal is to ensure compliance with the applicable rules and standards in the TAM during the conduct of airworthiness-related activities by the organization. The Airworthiness Acceptability process normally involves the following activities:

a. **Desktop Audit.** The TAA conducts a desktop audit of the APM and the associated procedures and plans submitted by the organization seeking Organizational Acceptability. This consists of an in-depth review and assessment of the APM and the associated procedures and plans to ensure the organization is in compliance with the TAM. If the Desktop Audit determines that the organization is compliant with the TAM, the APM will be approved and an Organizational Acceptability Audit will be scheduled.

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b. **Organizational Acceptability Audit.** Normally, organizations operate for a period of time under "Provisional Status" using their TAA-approved APM prior to scheduling an Organizational Acceptability Audit. The TAA uses Provisional Status when all requirements of the TAM have not been satisfied but the TAA is confident that the organization's activities will not impact the level of safety of the aircraft type being supported. Under a Provisional status, there may be limitations on the scope of work authorized and there will be a requirement for a review and re-issue of the provisional status within 12 months. The purpose of the Organizational Acceptability Audit is to verify that the airworthiness-related activities have been performed in accordance with the TAA-approved APM and its associated procedures and plans. Following successful completion of the Audit, the TAA will remove the Provisional Status and issue a Certificate of Accreditation.

c. **Airworthiness Surveillance Activities.** To retain Organizational Acceptability, an organization must maintain compliance with the TAM in the ongoing performance of airworthiness-related activities. Therefore, following the granting of full Organizational Acceptability status, the TAA will continuously monitor the airworthiness-related activities performed within an organization using various surveillance techniques. The airworthiness surveillance activities conducted will be based on a level of confidence in the organization and will be performed against the TAA-approved APM.

d. **Periodic Comprehensive Audit.** In addition to the regular airworthiness surveillance activities, the TAA will conduct a Periodic Comprehensive Audit of the organization at regular intervals of three to five years. These audits will combine the activities of a Desk Top Audit (verification that the manuals, procedures and plans comply with the TAM) with an Acceptability Audit (verification that, in turn, the airworthiness activities comply with those documents).

e. **Periodic Survey.** The TAA may decide for the organization to complete a survey without conducting a formal on-site audit. This level of oversight is reserved for organizations that have a limited airworthiness scope.

5. The following Acceptable Organizations are included in the Technical Airworthiness Program:

a. **Acceptable Design Organization (ADO).** An ADO is an organization that is deemed acceptable to develop the design of aeronautical products, including subsequent design changes to an approved type design. An ADO may also be approved to provide engineering support to aeronautical products. An ADO's scope and depth of technical airworthiness authority may include making findings of compliance, granting airworthiness approval and granting flight authority. The APM in an ADO is an Engineering Process Manual (EPM). Specific requirements for an ADO are covered in Section 2, Annex E, of this chapter;

b. **Acceptable Technical Organization (ATO).** An ATO is an organization deemed acceptable to conduct the life cycle materiel management of an approved aeronautical product type during the in-service phase. The Type Certificate Holder for an approved type design is normally approved as an ATO. An ATO's scope and depth of technical airworthiness authority includes granting TAC, and may also include making findings of compliance, granting airworthiness approval and granting flight authority. The APM in an ATO is an EPM. Specific requirements for an ATO are covered in Section 2, Annex A, of this chapter;

c. **Acceptable Manufacturing Organization (AMfgO).** An AMfgO is an organization deemed acceptable to manufacture aeronautical products. An AMfgO's scope and depth of technical airworthiness authority normally includes certifying product conformance following manufacture. The APM in an AMfgO is a Manufacturing Process Manual (MfgPM). Specific requirements for an AMfgO are covered in Section 2, Annex B, of this chapter;

d. **Acceptable Maintenance Organization (AMO).** An AMO is an organization deemed acceptable to conduct the maintenance or repair and overhaul of aeronautical products. An AMO's scope and depth of technical airworthiness authority normally includes maintenance release and aircraft release. The APM

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in an AMO is a Maintenance Process Manual (MPM). Specific requirements for an AMO are covered in Section 2, Annex C, of this chapter; and

e. **Acceptable Materiel Support Organization (AMSO).** An AMSO is an organization that is deemed acceptable to conduct the materiel support of aeronautical products. For example, an aviation parts distributor would be approved as an AMSO. An AMSO's scope and depth of technical airworthiness authority normally includes certifying product conformance in materiel support activities. The APM in an AMSO is a Materiel Support Process Manual (MSPM). Specific requirements for an AMSO are found in Section 2, Annex D, of this chapter.

6. **Acceptability of Organizations - Recognition vs. Accreditation.** In order to be deemed acceptable, organizations must be either Recognized or Accredited.

a. **Civil/Other Military Airworthiness Authority Recognition.** The TAA may recognize organizations that hold approvals from other airworthiness regulatory bodies. This process involves TAA staff reviewing the organization's existing policies and processes for compliance with the DND airworthiness requirements and the alternative standards under the organization's current airworthiness regulator. The TAA may choose to recognize existing delegations and authorizations as part of this process (e.g., Design Engineers, Maintenance Release Authority). As a result of the TAA review, TAA staff will identify airworthiness requirements not covered within the existing policy and processes that require supplementary details for application within DND. Airworthiness activities and functions performed by individuals within Recognized organizations fall under the auspice of the Minister of National Defence. Examples of supplementary details include the militarization of civilian airworthiness forms, the processes that dictate how an organization interacts with the DND WSM and TAA staff, the airworthiness scope of the organization, and receiving inspection policies for aeronautical products received from the Canadian Forces Supply System (CFSS).

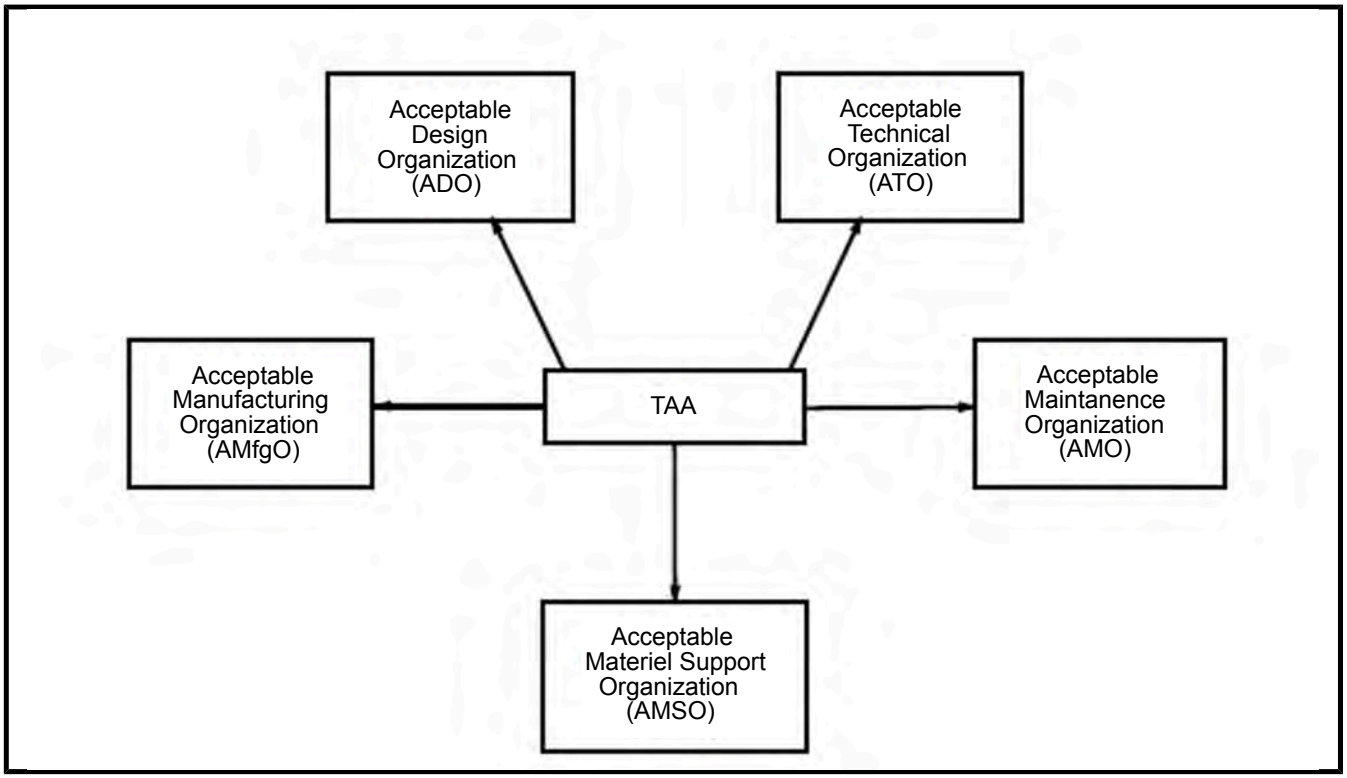

Figure 1-4-1-1 TAA-Acceptable Organization Types

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b. **Original Equipment Manufacturer (OEM) Recognition.** The TAA may recognize OEMs and other organizations to perform airworthiness activities and functions where they are accepted throughout the worldwide aviation community as capable and competent in design, manufacture, maintenance or materiel support. The level of review required is determined on a case-by-case basis and is dependent on the expertise and type of activity performed by the organization. The TAA may choose to indirectly issue OEM recognition by including a statement within an Accredited or Recognized Organization's APM. An example of this is the inclusion of an OEM within an ATO's Design Support Network and by stating that the ATO considers all data from the OEM as approved data. However, OEMs who have been directly contracted to provide in-service-support activities to DND are usually required to achieve formal Accreditation or Recognition.

c. **Accreditation.** Accreditation is required for organizations that do not hold any existing approvals from other regulatory bodies. As a result, these organizations may need to develop APMs and enabling processes from scratch. TAA staff encourages the use of existing processes and procedures whenever possible to speed up the Accreditation process.

1.4.1.4 Assignment of Technical Airworthiness Authority to Individuals

1. The statutory authority for the delegation of airworthiness authority comes from subsection 4.3 (1), of the *Aeronautics Act*. To enable the exercising of technical airworthiness authority at lower levels within the DND/CAF and civilian contractors, the Technical Airworthiness Program employs a three-tiered assignment of authority system as follows:

a. **Delegation (First Level).** Authority granted by the MND, who is named in the *Aeronautics Act*, to the TAA;

b. **Designation (Second Level).** Authority assigned directly by the TAA who has been granted the power to have other individuals conduct airworthiness management roles and technical airworthiness functions on his/her behalf; and

c. **Authorization (Third Level).** Authority assigned by an individual within an Acceptable Organization who has been authorized to have other personnel within the same organization conduct airworthiness management roles and technical airworthiness functions on behalf of the TAA in accordance with a TAA-approved personnel authorization control system.

2. Technical airworthiness authority is assigned to individuals to perform airworthiness management roles or technical airworthiness functions on behalf of the TAA. Assignment of authority to individuals may be done directly by the TAA or by an authorized person within an Acceptable Organization. The assignment of technical airworthiness authority within an organization must be conducted in accordance with the TAA-approved personnel authorization control system described in the organization's APM. Minimum eligibility criteria of knowledge, skills and experience that individuals must meet in order to be assigned technical airworthiness authority are specified in the applicable annexes to this chapter.

3. The conduct of airworthiness-related tasks does not require the assignment of technical airworthiness authority. However, personnel performing airworthiness-related tasks must be competent and authorized. Within an Acceptable Organization, this authorization must be accomplished in accordance with the organization's TAA-approved personnel authorization control system.

4. Individual technical airworthiness authority to make specific findings of compliance on behalf of the TAA may also be assigned through a Compliance Program for a new type design or for a specific major design change to an approved type design. Refer to Part 2, Chapter 1 or Part 3, Chapter 2, respectively, for the assignment of technical airworthiness authority in those circumstances.

1.4.1.5 Technical Airworthiness Authority Assigned Directly by the TAA (Designation)

1. **TAA Designation of Airworthiness Management Roles.** Within an organization, the primary airworthiness management role is that of the person responsible for the airworthiness-related activities performed within the

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organization. This person is always designated directly by the TAA, and is an essential link between the TAA and the Acceptable Organization. Detailed responsibilities for this designated role, in each type of Acceptable Organization, are included in the applicable annexes to this chapter. The person responsible for the airworthiness-related activities in each type of Acceptable Organization is as follows:

a. Senior Design Engineer (SDE) for an ADO or an ATO;

b. Senior Maintenance Manager (SMM) for an AMO;

c. Senior Manufacturing Manager (SMfgM) for an AMfgO; and

d. Senior Materiel Support Manager (SMSM) for an AMSO.

2. **TAA Designation of Technical Airworthiness Functions in Engineering Speciality Area** An individual may be assigned technical airworthiness authority directly by the TAA to make findings of compliance and/or grant airworthiness approval in speciality engineering areas, similar to that of a Transport Canada Design Approval Representative (DAR).

1.4.1.6 Authority Assigned by a Person within an Acceptable Organization (Authorization)

1. **Airworthiness Management Roles.** The person responsible for the airworthiness-related activities of an organization may appoint other individuals within that organization to perform specific airworthiness-related responsibilities or to authorize other individuals to perform technical airworthiness functions. For example, the SDE in an ATO may assign some of his/her airworthiness management responsibilities to another person within the organization who meets the applicable eligibility criteria. Another example is where the SMM in an AMO authorizes an individual as the person responsible for the assignment of authority (PRAA).

2. **Technical Airworthiness Functions.** An individual may be assigned authority to perform technical airworthiness functions in an Acceptable Organization by a person authorized to do so. The authorization must be conducted in accordance with the TAA-approved personnel authorization control system of the Acceptable Organization. Examples of authorizations are a Design Engineer (DE) authorized to make findings of compliance or a technician authorized to certify a maintenance release.

1.4.1.7 Authority, Responsibility and Accountability

1. Throughout the TAM, the term "the TAA" means the TAA personally or the TAA regulatory staff.

2. In certain situations a "person authorized to act for the TAA" may be permitted to accomplish those actions ascribed to "the TAA", provided:

a. the applicable rule, standard or associated advisory note indicates that the specific action may be accomplished by a person authorized to act for the TAA;

b. the specific action is included within the scope and depth of technical airworthiness authority formally assigned to the person. For example, a person may be authorized to:

(1) grant airworthiness approval for design changes to defined systems and components on a specific aeronautical product type;

(2) perform maintenance release following maintenance tasks on defined systems and components on a specific aeronautical product type; or

(3) certify product conformance following manufacture of defined systems and components on a specific aeronautical product type.

c. the person is not required to make a subjective decision in that the necessary criteria for assessing the situation are provided within the airworthiness rules or standards in the TAM or the TAA-approved APM

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for the organization, (for example, training organizations acceptable to the TAA as specified in Section 2, Annex C, of this chapter); and

d. interpretation of an airworthiness rule is not required.

3. A person within an Acceptable Organization who has been assigned technical airworthiness authority to perform either an airworthiness management role or a technical airworthiness function must have a clear understanding that the person is acting as a representative of the TAA. A person assigned technical airworthiness authority is accountable to the TAA for the responsibilities associated with the assigned authority.

4. The technical airworthiness authority assigned to a person is a privilege granted to them and not a right of the position currently held within the organization. Each person is assigned a defined scope and depth of authority, including privileges and limitations, while employed within the Acceptable Organization. Specific responsibilities associated with each airworthiness management role or technical airworthiness function within an Acceptable Organization are defined in the APM for the Acceptable Organization, in compliance with the applicable requirements of the TAM.

5. There are cases, however, where TAA authority will not normally be assigned to individuals outside the TAA regulatory organization. The specific circumstances are indicated in the applicable chapters of the TAM, but they mostly occur in type certification, design change certification and granting of flight authority. For example, airworthiness approval of a new type design and findings of compliance in defined critical areas would normally only be performed by the TAA.

6. In addition, several airworthiness-related decisions, such as issuing airworthiness rules and standards, the accreditation or recognition of organizations and the signing of type certificates are only made by the TAA personally.

7. The complete listings of specific authority retained by the TAA personally, and the authority retained within the TAA organization, are clearly detailed in Technical Airworthiness Authority internal procedure TAA01.002.

1.4.1.8 Liability of Personnel

1. The MND delegates authority to the TAA, which includes certain statutory powers, duties and functions derived from the provisions of the *Aeronautics Act*. In exercising these powers, duties and functions, the TAA is directly accountable to the MND. In this capacity as a delegated authority, the TAA is provided certain protection and indemnification by the Crown.

2. Those persons who have been assigned technical airworthiness authority in accordance with the rules and standards of the TAM are acting on the TAA's behalf. The liability protection provided to the TAA is extended to these authorized individuals provided they are acting within the scope of their duties and meeting reasonable departmental expectations, within the limitations and privileges specified in their authorization. In other words, persons who are assigned technical airworthiness authority are deemed to be operating "on behalf of the Crown" while executing an airworthiness management role or a technical airworthiness function. In this capacity, they are afforded the Crown's protection from external influence and legal liability. This protection is granted based on the premise that the individual will exercise "due diligence" in the actions and decisions taken while performing the role or function. The test of whether ***due diligence*** is achieved is guided by the following principle: ***The standard of care required is that which is expected from a reasonable person with similar knowledge, skills and experience, authorized to perform a similar airworthiness management role or technical airworthiness function.***

3. Treasury Board Policy on the Indemnification of and Legal Assistance for Crown Servants does not allow for indemnification of a person engaged under a contract for services. In order for a non-DND or non-CAF person to be indemnified, it must be clear that the authorized person is acting on behalf of the TAA when discharging duties pursuant to their authorization. This relationship must also be clearly understood by the organization, which employs the authorized person. The duties being discharged must be in addition to those required by a separate contractual relationship. One indicator would be, if the person or the organization was not performing the specified duty, DND would have to provide a person to perform it. Contractor personnel who perform airworthiness management roles or technical airworthiness functions on behalf of the TAA as required by a contractual agreement with the Crown

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are not deemed to be operating "on behalf of the Crown", therefore, the Treasury Board Policy would not provide them indemnification by the Crown or liability protection.

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SECTION 2

RULES AND STANDARDS

1.4.2.R1 Organizational Authority

1. Organizations whose personnel perform airworthiness management roles and/or technical airworthiness functions on behalf of the Technical Airworthiness Authority (TAA) in the conduct of technical support, manufacturing, maintenance, materiel support and/or design support of aeronautical products shall be deemed acceptable by the TAA in accordance with 1.4.2.S1.1.

ADVISORY NOTES

1. *Technical airworthiness functions are defined in Part 1, Chapter 3, and airworthiness management roles are defined in 1.4.1.2.*
2. *An organization does not normally need to be deemed acceptable by the TAA to conduct airworthiness-related activities, if:*
   a. *completion of the activity does not require an airworthiness management role or a technical airworthiness function to be performed on behalf of the TAA by the organization's personnel; and*
   b. *the activity is performed under the control of an acceptable organization, and the required technical airworthiness function will be performed by personnel from that organization.*
3. *However, an organization may require TAA acceptance depending on the circumstances involved. For example, an organization that provides support to several other organizations may need to be accepted to facilitate the working relationship between these organizations. Each case of acceptance will be evaluated on its own merits by the TAA.*

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4. *In the context of the above rule, the following descriptions are provided:*

   a. ***Technical Support*** *activity includes the airworthiness-related aspects of materiel management and the technical management of an approved type design for the life cycle of the* ***aeronautical*** *product. Typical engineering and technical support activities would include design change management, issuing of flight permits, technical investigations, configuration management, technical publication management and airworthiness oversight of established design support networks. Additional information is provided in Annex A to this chapter, as well as in Part 2, Chapters 1 and 3.*

   b. ***Manufacturing*** *activity includes the production of new aeronautical products, the local manufacture of repair parts and the production of aviation replacement parts. Additional information is provided in Annex B to this chapter and in Part 5, Chapter 4.*

   c. ***Maintenance*** *activity includes the conduct of maintenance (performance, verification, recording and reporting of maintenance tasks), control of maintenance, servicing and elementary work. Additional information is provided in Annex C to this chapter, in Part 3, Chapter 1 and in Part 5, Chapter 3.*

   d. ***Materiel Support*** *activity includes the procurement of aviation replacement parts and the disposal of aeronautical products. Additional information is provided in Annex D to this chapter, in Part 5, Chapter 2 and in Part 4, Chapter 1.*

   e. ***Design Support*** *activity includes the development of a new aeronautical product type design, development of design changes, airworthiness-related testing of aeronautical products and findings of compliance. Additional information is provided in Annex E to this chapter, in Part 2, Chapter 1 and in Part 3, Chapter 2.*

1.4.2.S1 Organizational Authority

1. **Acceptable Organizations.** In order to be deemed acceptable by the TAA, organizations must be Accredited (see 1.4.2.S1.2) or Recognized (see 1.4.2.S1.3) by the TAA.

2. **TAA Accreditation.** In order for the TAA to accredit an organization to perform the airworthiness-related activities described in its Airworthiness Process Manual (APM), the organization must satisfy the requirements set out in 1.4.2.S1.5 to 1.4.2.S1.9.

ADVISORY NOTE

TAA Advisory 2013-01 provides guidance on the process used by the TAA for accreditation, and TAA Advisory 2013-02 provides preparation instructions for an APM.

3. **TAA Recognition.** The TAA may recognize an organization that is accredited or approved by another airworthiness authority if the organization complies with 1.4.2.S1.5 to 1.4.2.S1.9. The organization shall create a TAA-approved DND Airworthiness Supplement (DAS) that meets the requirements of 1.4.2.S1.6 to 1.4.2.S1.9 which provides amplification to the organization's existing airworthiness policy.

ADVISORY NOTE

TAA Advisory 2013-03 provides guidance on the TAA recognition process. However, organizations should contact the TAA (DTAES 4 staff) for guidance on their eligibility to be recognized, vice accredited.

4. **TAA Indirect Recognition of OEMs and subcontractors**. Subcontractors whose personnel performs the equivalent of technical airworthiness functions in the conduct of technical support, manufacturing, maintenance, materiel support and/or design support of aeronautical products may be indirectly recognized by the TAA through their inclusion within the APM of an accredited or recognized organization.

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ADVISORY NOTE

An organization approved by another regulatory agency (such as the UK MOD, US DoD, Transport Canada Civil Aviation or US FAA) for the conduct of design, manufacture, maintenance or materiel support of aeronautical products, and whose processes are accepted as equivalent, would meet the technical airworthiness requirements of the TAM. If the TAA needs to formally task the organization with performing technical airworthiness functions on behalf of the TAA, then the organization will need to be deemed acceptable.

5. **Eligibility Criteria.** To be eligible for TAA Acceptability, an organization must:

a. have a justifiable need for the intended scope and depth of technical airworthiness authority;

b. have a DND/CAF sponsor, if it is an organization external to DND;

c. have a commitment by the head of the CAF unit or company Senior Management to:

(1) provide the resources required for the effective performance of the airworthiness-related activities of the Acceptable Organization;

(2) grant staff within the Acceptable Organization the power to effectively perform the authorized airworthiness management roles and technical airworthiness functions on behalf of the TAA;

(3) ensure that personnel within the Acceptable Organization remain knowledgeable and skilled with respect to their technical airworthiness responsibilities;

(4) grant access to the TAA staff to perform oversight activities to assess compliance with the APM; and

(5) acknowledge that non-compliance with the TAM may result in loss of acceptability of the organization.

ADVISORY NOTES

1. *For CAF maintenance and engineering organizations, the commitment is contained in the publication C-05-005-P02/AM-001, which mandates the Airworthiness Program for all CAF maintenance and engineering organizations; and*

2. *Senior Management is defined as being at the executive level in the company hierarchy.*

d. have a process to enter into support arrangements with acceptable organizations or personnel, where necessary, to support the intended scope and depth of technical airworthiness authority. This process should:

(1) confirm that all applicable airworthiness requirements are met, including ensuring that the organization:

(a) has an appropriate airworthiness control system for the scope of activities conducted; and

(b) has a quality management system that provides oversight on all airworthiness activities conducted.

ADVISORY NOTE

Acceptable organizations are responsible for ensuring compliance with all applicable airworthiness rules and standards for work performed by a supporting organization on their behalf. Therefore, the airworthiness certification requirements associated with the necessary technical airworthiness functions are an important consideration in the development of support arrangements, particularly with organizations that are not accredited or recognized by the TAA.

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(2) ensure that sufficient contractor oversight is performed on subcontractors performing airworthiness activities;

(3) describe how technical data is approved and exchanged between organizations; and

(4) describe how direct supervision is conducted by an authorized person from the acceptable organization when the organization performing the work is neither accredited nor recognized by the TAA. This description shall include how an authorized individual from the Acceptable Organization certifies the work.

ADVISORY NOTE

Direct supervision means that the person from the Acceptable Organization tasked with certifying the work should personally observe or review the work to the extent necessary to ensure compliance with the intent of the organization's APM and any applicable standards of airworthiness. The following may be required in order to enable the person from the Acceptable Organization to exercise this supervision and to perform the required technical airworthiness function upon completion of the work:

a. *specifying the knowledge, skills and experience required for the personnel within the supporting organization who will perform the work;*

b. *defining the Acceptable Organization's supervision requirements during the performance of work by the supporting organization;*

c. *defining the process for the acceptance of work, including any necessary airworthiness certifications; and*

d. *defining the process for the application of quality management system requirements.*

e. have adequate facilities and equipment to conduct the airworthiness-related activities of the organization;

f. have clearly defined lines of responsibility for the airworthiness management roles and technical airworthiness functions performed within the organization and identify:

(1) the person(s) within the organization who will be designated directly by the TAA to perform airworthiness management roles;

(2) the person(s) responsible for the assignment of technical airworthiness functions within the organization; and

(3) the positions within the organization that will be authorized to perform technical airworthiness functions.

g. have clearly defined the knowledge, skills and experience eligibility criteria for personnel to perform the airworthiness management roles, technical airworthiness functions and airworthiness-related tasks of the organization;

h. employ sufficient competent personnel to perform the airworthiness management roles, technical airworthiness functions and airworthiness-related tasks within the organization;

i. have a system to control the authorization of personnel to ensure that only competent personnel who satisfy the defined eligibility criteria, in accordance with 1.4.2.S1.5.g, perform airworthiness management roles, technical airworthiness functions and airworthiness-related tasks;

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j. have an ongoing training program commensurate with the type of organization and the airworthiness management roles, technical airworthiness functions and airworthiness-related tasks involved, to provide:

(1) initial training to ensure that persons taking on new duties are aware of their airworthiness-related responsibilities associated with the role, function or task they will perform, including the airworthiness control system and airworthiness documentation control system used within the organization;

(2) recurring training to ensure that personnel remain competent in the performance of a function or task that does not occur frequently or where the complexity and/or criticality requires it, or in order to make personnel aware of any changes that may have occurred since the last time they performed the function or task; and

(3) additional training where it is shown to be necessary by a finding made under the quality management system audit program or required due to changes in the airworthiness rules and standards or the organization's airworthiness-related processes or procedures.

k. have the necessary airworthiness control system to ensure the technical airworthiness functions and airworthiness-related tasks performed by personnel within the organization are in accordance with the applicable airworthiness rules and standards in the TAM;

l. have an airworthiness documentation control system to ensure the airworthiness-related information, technical data and publications used and generated by the organization and through any support arrangements implemented, in accordance with 1.4.2.S1.5.d, are:

(1) adequate for the airworthiness-related activities involved; and

(2) managed in accordance with Part 5, Chapter 5.

m. have the necessary safety programs commensurate with the airworthiness-related activities conducted;

ADVISORY NOTES

1. *The safety programs implemented by an organization for reasons other than airworthiness may satisfy specific airworthiness-related requirements specified in the TAM. For example, the occurrence of reporting requirements for a General Safety Program or Flight Safety Program may partially satisfy the aeronautical product monitoring requirements as specified in Part 3, Chapter 4.*

2. *The following are examples of safety programs:*

   a. *Flight Safety Program;*

   b. *Air Weapons Safety Program; and*

   c. *FOD/Tool Control Program.*

3. *CFTO C-05-005-P10/AM-001 provides additional guidance on safety programs and direction for CAF organizations.*

n. have a Human Factors training program for all personnel with technical responsibilities, which includes:

(1) initial training that shall be completed during the first year of employment; and

(2) recurring training that shall not exceed 36 months.

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ADVISORY NOTES

1. *TAA Advisory 2017-03 describes an acceptable means of compliance for an organization employing persons with technical responsibilities.*

2. *The requirements for Human Factors training in Civilian Aviation organizations accredited by Transport Canada are detailed in the CARs. In the CAF these requirements are addressed in the RCAF Flight Operation Manual (FOM) 4.4 - Section 4 - HPMA.*

o. have an established quality management system acceptable to the TAA in accordance with Part 1, Chapter 6; and

p. have an APM for the organization that meets the requirements of 1.4.2.S1.6 to 1.4.2.S1.9.

ADVISORY NOTE

For all CAF maintenance units, the C-05-005-P03/AM-001 to C-05-005-P10/AM-001 series of publications meets most of the requirements of a MPM for the maintenance of CAF aircraft. For CAF engineering organizations, the C-05-005-P12/AM-001 publication meets most of the requirements of an Engineering Process Manual (EPM) for engineering support of CAF aircraft. Exceptions to these publications must be covered in the unit Manual of Aerospace Procedures (MAP), or in a specific MPM or EPM developed for the unit and approved by the TAA.

6. **Airworthiness Process Manual (APM).** Each organization seeking accreditation shall submit for the TAA's approval an APM that includes the following:

ADVISORY NOTE

TAA Advisory 2013-02 provides guidance and preparation instructions for an APM.

a. **Introduction.** An introductory section including;

(1) an approval page;

(2) a history of changes page;

(3) a list of effective pages;

(4) a table of contents;

(5) a description of the method used to approve, amend, and distribute the manual in accordance with 1.4.2.S1.8;

(6) a list of the documents incorporated by reference, in accordance with 1.4.2.S1.7, and a description of the method used to control these documents;

(7) upon accreditation, the letter of accreditation from the TAA;

(8) a statement of the commitment by the head of the CAF unit or company Senior Management, as required in 1.4.2.S1.5.c;

ADVISORY NOTE

The following are examples of who is responsible for making the statement of commitment:

a. *For the CAF maintenance and engineering organizations, the statement of commitment by the head of the unit is contained in the publication C-05-005-P02/AM-001, which mandates the Airworthiness Program for all CAF maintenance and engineering organizations.*

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b. *For a civilian organization to be accredited by the TAA, the Senior Manager or executive who identified this individual (SDE, SMfgM, SMM or SMSM) should provide the statement of commitment.*

b. **CAF Unit or Company Identification.** Identification of the unit or company to which the organization seeking accreditation belongs or reports, including a brief description of the following:

(1) the organizational structure;

(2) associated lines of responsibility;

(3) approximate size and geographic location of the office facilities;

(4) the business site, when not co-located;

(5) the legal name of the company and its location; and

(6) the mailing address of the company.

c. **Accredited Organization Description.** A description of the accredited organization including:

(1) the facilities and equipment relevant to the type of organization;

(2) the airworthiness-related activities conducted by the accredited organization;

(3) the scope and depth of technical airworthiness authority of the accredited organization; and

(4) where applicable, the policy on how to enter into and manage support arrangements for the work performed by other organizations in support of the accredited organization, as required in 1.4.2.S1.5.d, and the applicable annex to this chapter; and

(5) the list of subcontractor organizations providing airworthiness support and their airworthiness scope.

ADVISORY NOTE

The list of subcontractor organizations providing airworthiness support is sometimes referred to as an Approved Suppliers List (ASL).

d. **Organizational Structure.** A description of the organizational structure of the accredited organization, including:

(1) the internal lines of responsibility;

(2) the lines of communication to the designated Type Certificate Holder and Design Authority for the aeronautical product type design as applicable for the type of organization;

(3) the position title, duties, responsibilities, authorizations and defined eligibility criteria of the position(s) within the organization who is (are) designated directly by the TAA to perform airworthiness management roles;

(4) the position title, duties, responsibilities, authorizations and defined eligibility criteria of the position(s) responsible for assignment of authority;

(5) the position title, duties, responsibilities, authorizations and defined eligibility criteria of the positions(s) within the organization that will be authorized to perform technical airworthiness functions.

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e. **Personnel Authorization Control.** A description of the system used within the accredited organization to authorize personnel to perform the applicable airworthiness management roles, technical airworthiness functions and airworthiness-related tasks.

f. **Ongoing Training Program.** A description of the ongoing training program to meet the initial, recurring and additional training requirements of the organization.

g. **Airworthiness Control System.** A description of the airworthiness control system used by the organization in accordance with 1.4.2.S1.5.k, and the applicable annex to this chapter, including all processes necessary to ensure that technical airworthiness functions and airworthiness-related tasks are performed in a manner that assures the airworthiness of aeronautical products;

h. **Airworthiness Documentation Control.** A description of the airworthiness documentation control system used to manage and control the airworthiness-related information, technical data and publications used and generated by the organization, in accordance with 1.4.2.S1.5.l. This includes a brief description of the processes for the production, acquisition, maintenance, identification, change control, release, distribution, traceability, filing, storage, safe keeping, accessibility, retrievability, retention and disposal of documents. If electronic media is used, a description of the means used to meet the requirements of 5.5.2.R4;

i. **Safety Programs.** A brief description of the airworthiness-related safety program(s) of the organization, as required by 1.4.2.S1.5.m, including details where a safety program is used to satisfy specific TAM requirements;

j. **Quality Management System.** A description of the quality management system of the organization as required by 1.4.2.S1.5.o, including:

(1) the standard on which the quality management system is based;

(2) the name of the independent evaluator, and the scope and status of the evaluation;

(3) a description of the organizational structure of the quality personnel within the accredited organization, including the responsibilities and authorities of the person appointed as management representative for the implementation and maintenance of the quality management system and, when the accredited organization is part of a larger corporate organization, the relationship and communication line between the accredited organization quality structure and the corporate quality structure;

(4) a description of the quality management system documentation structure, its inter-relationship with the APM and other airworthiness-related documentation;

(5) a description of how specific quality assurance processes, internal audits, management review and corrective and preventive action programs are integrated into the airworthiness-related activities of the accredited organization;

(6) a commitment statement to the effect that the independent evaluator audit reports, including follow-up Corrective Action Plans, will be made available to the TAA in accordance with 1.6.2.R1; and

(7) a description of the method used to ensure all airworthiness-related quality management system documentation and processes are in compliance with the APM to meet the requirement of 1.4.2.S1.5.k, including initial organization approval and subsequent review and/or update to comply with changes to the organization's APM or to the applicable airworthiness rules and standards.

k. **Additional Information.** In the opinion of the TAA, any other necessary information required.

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7. **Incorporation by Reference.** The TAA may authorize the incorporation by reference in an APM, of information located in other manuals, documents or lists prepared by the applicant, provided:

a. the policies affecting that information remain in the APM;

b. the title of the documents being incorporated by reference is clearly indicated in the APM;

c. the person responsible for the airworthiness-related activities of the organization certifies that the incorporated information meets the requirements established in the APM;

d. amendments to material incorporated by reference and to procedures that affect the APM are submitted for the TAA's review, unless the TAA stipulates otherwise; and

e. the person responsible for the airworthiness-related activities of the organization approves amendments to the manuals, documents and/or lists incorporated by reference prior to use within the organization.

8. **Approval, Amendment and Distribution of the APM.** The approval, subsequent amendment and distribution of the APM shall be processed as follows:

a. an applicant shall submit each page of its APM to the TAA for approval. Initial TAA approval of the process manual will be indicated in the letter of accreditation signed by the TAA. A copy of the letter of accreditation shall be included in the process manual in accordance with 1.4.2.S1.6.a(7) and a reference to the letter shall also be included on the process manual approval page. The page number and the revision and/or change date and number shall be marked on each page of the manual;

b. the APM shall be forwarded to the TAA for approval;

c. proposed amendments to the APM, accompanied by an approval page and covering letter, must be submitted for the TAA's approval prior to the issue of a revision by the organization. Material incorporated by reference and procedures affected by amendments to the APM shall also be submitted for review unless otherwise stipulated by the TAA. The documents submitted to the TAA for review must have as a minimum the following information enclosed:

(1) the reason for the submission of the documents to the TAA;

(2) the proposed document version number, change number and date;

(3) if amended, the list of all proposed changes incorporated in the submitted document;

(4) if amended, the reason for the proposed changes;

(5) the organizational Point of Contact;

(6) if unapproved, the document must be clearly marked as "DRAFT";

(7) approval of the submission from the SDE, SMM, SMSM or SMfgM, as applicable; and

(8) the affected statement shall be highlighted by a line in the margin on each amended page.

d. approval of process manual amendments shall be indicated in a change approval letter signed by the TAA. A reference to the signed change approval letter(s) shall be placed on the process manual approval page, immediately following the TAA letter of accreditation reference. An organization shall amend each copy of its APM within 30 days, after approval of an amendment by the TAA;

e. an organization shall amend its APM:

(1) when instructed to do so by the TAA; or

(2) where the manual contains policies or processes, or the lack thereof, such that the manual no longer meets the requirements of the TAM.

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f. current copies of the TAA-approved APM must be available to all personnel performing an airworthiness management role, technical airworthiness functions and/or airworthiness-related tasks. Where only a portion of the manual is provided, it shall be sufficiently comprehensive that the person performing the role, function or task has all relevant information; and

g. an APM will remain in effect until:

(1) an organization advises the TAA that it no longer requires the scope and depth of technical airworthiness authority and the APM is surrendered by the organization; or

(2) the APM for the organization is suspended or cancelled by the TAA.

9. **Deviations.** An organization shall comply with the applicable airworthiness rules and standards and/or its TAA-approved APM, except where it demonstrates that the deviation will not affect safety or will not reduce the level of safety below a level that is acceptable to the TAA, and the deviation is authorized in writing by the TAA.

1.4.2.R2 Individual Technical Airworthiness Authority

1. Technical airworthiness authority shall be assigned in accordance with 1.4.2.S2, to the following individuals performing airworthiness management roles on behalf of the TAA in accredited organizations:

a. the person identified in accordance with 1.4.2.S1.5.f(1), who is responsible for the airworthiness-related activities of the organization; and

b. the person(s) identified in accordance with 1.4.2.S1.5.f(2), who is (are) assigned the responsibility to authorize other personnel within the organization to perform technical airworthiness functions.

2. Technical airworthiness authority shall be assigned in accordance with 1.4.2.S2 to individuals to perform any of the following technical airworthiness functions on behalf of the TAA:

a. Finding of Compliance;

b. Airworthiness Approval;

c. Technical Airworthiness Clearance (TAC);

d. Granting of Flight Authority;

e. Aircraft Release;

f. Maintenance Release;

g. Manufacturing Product Conformance; and

h. Material Product Conformance.

1.4.2.S2 Individual Technical Airworthiness Authority

1. **Authority Assigned Directly by the TAA (Designation).** An individual may be designated directly by the TAA to perform airworthiness management roles and technical airworthiness functions, as follows:

ADVISORY NOTE

TAA Advisory 2013-04 provides guidance on the process used by the TAA for the assignment of authority to individuals within Accredited Organizations.

a. **Airworthiness Management Roles.** The TAA shall designate directly the individual responsible for the airworthiness-related activities of an accredited organization. Designation by the TAA is an individual

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authority; the letter granting that authority is to be retained by the individual until no longer employed in that capacity. To be eligible for designation, individuals must:

(1) meet the knowledge, skills and experience criteria specified in the appropriate annex for each applicable type of organization;

(2) be identified by the organization's Senior Management to act as the person responsible for airworthiness-related activities within the accredited organization; and

(3) provide formal acceptance of the responsibilities and authorities listed in the appropriate annex to this chapter to the TAA.

b. **Technical Airworthiness Functions in Engineering Speciality Areas.** An individual may be assigned technical airworthiness authority directly by the TAA to make findings of compliance within a certification program. To be eligible for this designation, an individual must:

(1) be identified within the applicable certification plan;

(2) meet the knowledge, skills and experience criteria appropriate for scope of authority;

(3) submit an application to the TAA; and

(4) provide formal acceptance of responsibilities and authorities to the TAA.

ADVISORY NOTE

AEPM Procedure TAA04.006 provides guidance on the process used by the TAA to assess the nomination and approval of an individual as a Finding Authority in a specific airworthiness compliance program.

2. **Authority Assigned by a Person within an Accredited Organization (Authorization).** An individual may be assigned technical airworthiness authority to perform airworthiness management roles in accordance with 1.4.2.S1.5.f(2), or to perform technical airworthiness functions in accordance with 1.4.2.S1.5.f(3), within an accredited organization by a person authorized to do so. The authorization shall be conducted in accordance with the TAA-approved personnel authorization control system of the accredited organization required by 1.4.2.S1.5.i, and described in the organization's APM. To be eligible for the assignment of technical airworthiness authority, individuals must:

a. have a justifiable need for the scope and depth of technical airworthiness authority to be assigned; and

b. meet the eligibility criteria specified in the applicable annex to this chapter and as detailed in the organization's APM.

3. **Acceptance of Airworthiness Authority.** Similar to the formal acknowledgement of responsibilities and authorities required of a person assigned Designation or second level of authority by the TAA, a person assigned authorization or third level of authority is to formally acknowledge acceptance of these responsibilities and authorities to the person within the organization who has assigned these authorities.

4. **Revoking Airworthiness Authority.** If an individual assigned airworthiness authority can no longer act on behalf of the TAA as originally assigned due to termination of employment with the organization or any other cause, then the airworthiness Assignment of Authority is automatically revoked. No specific documentation of the revoking is required since the formal assignment of authorization authority will clearly state the criteria to keep the Assignment of Authority in effect.

ADVISORY NOTE

When given cause for revoking authority, the TAA would issue a letter of notification to the individual and, if applicable, to the organization.

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ANNEX A

ACCEPTABLE TECHNICAL ORGANIZATION (ATO)

1. **Eligibility Criteria.** To be deemed acceptable by the Technical Airworthiness Authority (TAA) as an Acceptable Technical Organization (ATO), an organization must meet the requirements stipulated in Section 2 of this chapter (1.4.2).

2. **Engineering Process Manual (EPM).** To be deemed acceptable by the TAA, an organization must have an Airworthiness Process Manual (APM) that meets the requirements of 1.4.2 The APM in an ATO is an EPM. In addition to the requirements stipulated in 1.4.2, the following standards apply.

ADVISORY NOTE

Refer to TAA Advisory 2013-02, for additional guidance on the development of an Airworthiness Process Manual and a sample Table of Contents.

a. **ATO Description.** The scope of activities performed within the ATO must be clearly defined and include all airworthiness-related activities. The scope of activities will vary depending on whether the ATO is the Type Certificate Holder (TCH) for the aeronautical products involved or an ATO providing technical support.

b. **Scope and Depth of Authority.** The scope and depth of technical airworthiness authority shall be described by listing the specific technical airworthiness functions and airworthiness-related tasks that will be performed.

ADVISORY NOTE

The technical airworthiness functions performed in an ATO may include airworthiness approval, TAC and granting flight authority. Normally, findings of compliance for design certification are performed within an Acceptable Design Organization (ADO). The technical airworthiness tasks may include management of Special Inspections, publication management, assessment of Service Bulletins and the conduct of risk assessments.

c. **Support Arrangements.** The EPM should include the process for entering into support arrangements with organizations that provide design support services to the ATO and describe the processes used to provide technical airworthiness oversight of any organizations within their Design Support Network (DSN). Accreditation or recognition as an ATO is conditional upon the comprehensiveness of the DSN in providing the required technical airworthiness functions and on the accreditation or recognition of the organizations comprising the DSN. The DSN shall be approved by the TAA during the accreditation of the ATO.

d. **Relationship with the TCH.** The EPM should include a description of interactions required with the ATO who exercises TCH responsibilities.

e. **Personnel Authorization Control.** The EPM shall provide a description of the authorization control system, including the process used to train and assess individuals who are assigned authority within the ATO to perform:

(1) the specific airworthiness management responsibilities of the Senior Design Engineer (SDE);

(2) technical airworthiness functions as a Design Engineer (DE); and

(3) airworthiness-related tasks in the engineering support and technical management of aeronautical products.

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ADVISORY NOTE

The authorization system must have provisions that cover staff performing Life Cycle Materiel Management (LCMM) activities. Within the EPM, the organization must include the skill, knowledge and experience requirements for LCMMs. These requirements will be based on the complexity of the activities being performed within the ATO.

f. **Airworthiness Control System.** The EPM shall describe the airworthiness control system and include all applicable processes that manage:

(1) Design changes, in accordance with the requirements of Part 3, Chapter 2;

(2) Issuing of Flight Permits, in accordance with Part 5, Chapter 7;

(3) Configuration Management, in accordance with Part 3, Chapter 3;

(4) Airworthiness Risk Management, in accordance with Part 5, Chapter 1;

(5) Compliance with Airworthiness Directives, in accordance with Part 5, Chapter 6;

(6) In-service Airworthiness Monitoring, in accordance with Part 3, Chapter 4;

(7) Procurement and Control of Aviation Replacement Parts, in accordance with Part 5, Chapter 2;

(8) Disposal of Aeronautical Products, in accordance with Part 4, Chapter 1;

(9) Publication management, in accordance with Part 5, Chapter 5;

(10) Type Design Examination, in accordance with Part 2, Chapter 5;

(11) Maintenance Program Management, in accordance with Part 5, Chapter 3;

(12) Technical Airworthiness Clearance, in accordance with Part 2, Chapter 3;

(13) Control of Aircraft Technical Record requirements, in accordance with Part 5, Chapter 5;

(14) Provision of Engineering Support to AMO, in accordance with 1.4.2C.2.f and Part 3, Chapter 1 for: deviations from the Approved Maintenance Program, deferral of defects, substitute parts, borrowing of aviation replacement parts and parts recertification; and

(15) Any other process(es) required for the organization to carry out its airworthiness-related activities in compliance with the TAM.

ADVISORY NOTE

An ATO may choose to use an Airworthiness Control Committee (ACC) to facilitate the management of airworthiness related activity. An ACC is mandatory for an ADO and the applicable standards for an ACC are contained.

g. **Engineering Direction.** The EPM should include a description of the methods used for the transmittal of direction by the ATO or other organizations within the DSN. The engineering direction provided shall be captured using appropriate documentation and transmittal techniques that will ensure that support is approved by authorized individuals, and captured as an organizational record, in accordance with Part 5, Chapter 5.

3. **Individual Technical Airworthiness Authority.**

a. **Senior Design Engineer (SDE).** The SDE is identified by the CAF unit or company to be responsible for the airworthiness-related activities conducted within the ATO. To perform this airworthiness management role, the SDE requires the assignment of technical airworthiness authority by the TAA. As a designated representative of the TAA, the SDE shall ensure that the airworthiness-related activities of the ATO are

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performed in compliance with airworthiness rules and standards. The SDE may also perform technical airworthiness functions on behalf of the TAA.

(1) **SDE Eligibility Criteria.** To be eligible for the assignment of technical airworthiness authority by the TAA, a SDE must meet the minimum knowledge, skills and experience criteria as listed below:

(a) **Knowledge.** The following knowledge is required:

i. Be a graduate of an applicable engineering discipline from a university recognized by the TAA, or, in the opinion of the TAA, have equivalent knowledge gained through other forms of education and training;

ii. In the opinion of the TAA, have detailed knowledge of the organization's Airworthiness Process Manual and applicable core procedures and/or work instructions;

iii. Have detailed knowledge, gained by formal training and/or work experience, of the DND technical airworthiness rules and standards:

(i) through successful completion of a DND-SDE course or having equivalent, relevant experience, and

(ii) pertaining to the TAM chapters on design change certification, technical airworthiness clearance, type design examination, risk management, approved maintenance program, and airworthiness monitoring;

iv. In the opinion of the TAA, have detailed knowledge, gained by formal training and/or work experience, of the specific aeronautical products involved;

v. Have a detailed understanding of the Statement of Operating Intent (SOI) document or applicable operational requirements and environment of the specific aeronautical products involved;

vi. The SDE of the TCH organization shall have a detailed understanding of all TCH responsibilities, including the DND Airworthiness Review Board (ARB) process;

vii. Demonstrate a detailed understanding of the following topics to the satisfaction of the TAA:

NOTE

These topics may also be covered as part of the formal interview process.

(i) the scope and depth of technical airworthiness authority assigned by the TAA to the ATO and to other organizations involved in the design and engineering support of the approved type designs involved,

(ii) the airworthiness responsibilities of the ATO for work that is accomplished by both the organization and external agencies through support arrangements,

(iii) the responsibilities of the airworthiness management role of SDE,

(iv) the responsibilities of the persons within the ATO who have been assigned authority to perform technical airworthiness functions on behalf of the TAA,

(v) the EPM for the ATO, including associated procedures, and

(vi) the inter-relationship and interfaces between Technical Airworthiness Program and Quality Management System requirements.

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(b) **Skills.** As applicable for the scope and depth of technical airworthiness authority of the organization, the following skills are required, as well as the ability to demonstrate or provide current and/or past examples regarding the ability to:

i. Correctly interpret airworthiness standards;.

ii. Correctly apply airworthiness processes;

iii. Develop processes for inclusion in the EPM that are in compliance with the applicable airworthiness rules and standards;

iv. Evaluate ATO procedures for compliance with the TAA-approved EPM;

v. Prepare risk assessments;

vi. Assess the category assigned during the development of a design change to an approved type design for an aeronautical product;

vii. Prepare Technical Airworthiness Clearance (TAC) plans;

viii. Approve deviations to the Approved Maintenance Program;

ix. Provide guidance on the use of independent airworthiness reviews to personnel within the organization;

x. Apply management principles to:

(i) ensure that airworthiness-related activities are conducted in accordance with the TAA-approved EPM and the ATO-approved procedures,

(ii) ensure that the authorization of personnel performing airworthiness-related tasks and technical airworthiness functions is accomplished in accordance with the TAA-approved EPM and the ATO-approved procedures,

(iii) monitor the competencies of individuals to whom technical airworthiness authority has been assigned and of the organization as a whole,

(iv) monitor the development and progress of DE candidates,

(v) evaluate the capabilities of personnel for the assignment of technical airworthiness authority,

(vi) ensure adequate engineering competence is applied in the engineering decisions that may affect the airworthiness of an approved type design for an aeronautical product,

(vii) ensure that appropriate action is taken to correct any practice or procedure which may compromise the airworthiness of an aeronautical product and/or that the matter is brought to the attention of the TAA;

xi. Issue airworthiness instructions when a non-compliance with airworthiness rules and standards or a non-conformance with the approved type design is discovered; and

xii. Communicate with external agencies to:

(i) ensure that contracts or service level agreements are developed and maintained as necessary to enable the ATO to provide the scope and depth of design and engineering support required,

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(ii) ensure that the relationship with the TCH provides a clear understanding of the ATO and TCH-related responsibilities and roles in the conduct of engineering support, and

(iii) ensure work performed by external agencies, who are not a TAA-acceptable organization, is conducted in accordance with ATO-approved procedures.

(c) **Experience.** The SDE must have:

i. no less than six (6) years of relevant aerospace engineering experience and with progressively more responsibilities; and

ii. relevant aerospace engineering and maintenance experience for the aircraft type being supported, when the SDE is in the TCH organization.

(2) **SDE's Responsibilities.** A SDE within an ATO has the following responsibilities within the limitations and restrictions of the technical airworthiness authority assigned by the TAA:

(a) interpreting airworthiness standards and processes;

ADVISORY NOTE

*An airworthiness rule defines exactly **what** must be achieved or accomplished while airworthiness standards specify the **criteria and/or process for the assessment or demonstration of compliance** with the rule. Interpretation of a standard is permitted because there may exist various means of achieving or accomplishing the desired result and demonstrating compliance with the rule. Interpretation of airworthiness rules is not permitted other than by the TAA.*

(b) ensuring that the EPM for the organization is in compliance with the applicable airworthiness rules and standards;

(c) ensuring that the procedures of the ATO are in compliance with the TAA-approved EPM and are documented in a publication approved within the organization;

(d) ensuring that airworthiness-related activities are conducted in accordance with the TAA-approved EPM and the ATO-approved procedures;

(e) ensuring that the authorization of personnel performing airworthiness-related tasks and technical airworthiness functions is accomplished in accordance with the TAA-approved EPM and the ATO-approved procedures;

(f) providing guidance on the use of independent airworthiness reviews, and ensuring that they are conducted by authorized individuals in accordance with the ATO-approved procedures;

(g) taking action to correct any practice or procedure that may compromise the airworthiness of an aeronautical product or drawing, by bringing the matter to the attention of the TAA and/or the TCH, and advising the applicable organizational authorities of actions taken, if the situation is beyond the control of the individual;

(h) notifying the TAA/TCH of any procedural difficulties or deficiencies that result from airworthiness rules and standards or TAA-approved processes, making recommendations for rectification and/or improvement and advising the applicable organizational authorities of actions taken;

(i) keeping the TAA informed of any significant issues or developments that may adversely affect the airworthiness of an approved type design for an aeronautical product and advising the applicable organizational authorities of actions taken;

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(j) monitoring the competencies of individuals to whom technical airworthiness authority has been assigned and of the organization as a whole and informing the TAA of any deficiencies, advising the applicable organizational authorities of actions taken;

(k) revoking technical airworthiness authority from individuals within the organization when it is deemed appropriate to do so;

(l) ensuring that personnel within the organization receive the necessary training and remain knowledgeable and skilled in the conduct of airworthiness-related tasks and technical airworthiness functions;

(m) monitoring the development and progress of DE candidates;

(n) ensuring that there is, at all times, someone available to carry out the SDE responsibilities;

(o) during the SDE's absence, formally authorizing a competent individual within the ATO to assume the technical responsibilities as Acting SDE (A/SDE). This must be completed by letter, fax or e-mail, and must list any restrictions and/or limitations to that authority, subject to the following limitations:

i. A/SDE roles may not last beyond four (4) months without TAA approval and the SDE must notify the TAA in circumstances where the SDE is permanently leaving the ATO or leaving for an extended period of time; and

ii. A/SDEs cannot issue authorizations to individuals to perform airworthiness functions within the ATO;

(p) ensuring specifications prepared for the development, test and/or technical support of an approved type design for an aeronautical product are in compliance with the applicable airworthiness rules and standards;

(q) ensuring adequate technical competence is applied in the decisions that may affect the airworthiness of an approved type design for an aeronautical product during the airworthiness-related activities conducted within the organization;

(r) issuing airworthiness instructions as applicable regarding aeronautical products in operational service when a non-compliance with airworthiness rules and standards or a non-conformance with the approved type design is discovered;

ADVISORY NOTE

For an aircraft this may invalidate the certificate of airworthiness which had previously been granted to permit the operation of the specific aircraft until the non-compliance or non-conformance is corrected.

(s) ensuring any issues, problems or service difficulties discovered during engineering support or technical management are referred to the appropriate TCH for the approved type design and/or to the TAA;

(t) providing all necessary information for the TAA when the TAA decides to issue an Airworthiness Directive (AD) to rectify a deficiency;

(u) developing and maintaining a liaison with the Design Authority and TCH, as applicable, for the approved type design to the extent required to meet the engineering support and technical management responsibilities assigned to the organization;

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(v) ensuring that contracts or service level agreements with external agencies that support or are supported by the ATO are developed and maintained as necessary to enable the ATO to provide the scope and depth of engineering support and technical management required;

(w) ensuring work performed by external agencies that are not deemed acceptable by the TAA, in accordance with 1.4.2.R1, is conducted in accordance with the ATO-approved procedures. The ATO organization is responsible for the tasks to be performed, the quality of work and for meeting the airworthiness certification requirements for the technical airworthiness functions;

(x) ensuring the ATO is subject to adequate quality oversights for its entire airworthiness scope and depth of authority granted by the TAA;

(y) monitoring the adequacy of the corrective action plan raised to document non-compliances with the TAA-approved or recognized EPM and core procedures; and

(z) advising the TAA of any changes within the ATO or in support arrangements that will impact the scope and depth of technical airworthiness authority assigned to the ATO.

b. **Design Engineer (DE).** Within the ATO, the DE is assigned technical airworthiness authority by the SDE to conduct technical airworthiness functions, on behalf of the TAA, including airworthiness approval, TAC and/or granting flight authority. In this role, the DE is an authorized representative of the TAA.

ADVISORY NOTE

The DE assignment is not attached to any particular position within the ATO but rather is a role that must be performed by competent individuals who meet the applicable eligibility criteria.

(1) **DE Eligibility Criteria.** To be eligible for the assignment of technical airworthiness authority by the SDE as a DE, a person must meet the following criteria:

ADVISORY NOTES

1. *The scope and depth of airworthiness authority (that is, airworthiness management roles, functions and tasks) assigned to an ATO for a given aeronautical product shall have to be taken into account when determining the required DE knowledge, skills and experience requirements. Specific courses or experience may be required to show compliance to the following criteria as applicable.*

2. *Within the DND Technical Airworthiness Program, the use of the term DE can be applied to both engineers and technologists.*

(a) **Knowledge.** The following knowledge is required:

i. be a graduate of an applicable engineering discipline from a university recognized by the TAA or, in the opinion of the TAA, have equivalent knowledge gained through other forms of education and training;

ii. in the opinion of the SDE, have detailed knowledge, gained by formal training and/or work experience, of the technical airworthiness rules and standards;

iii. in the opinion of the SDE, have detailed knowledge, gained by formal training and/or work experience, of the specific aeronautical products involved;

iv. where required, a detailed understanding of the applicable operational requirements and environment; and

v. demonstrate a detailed understanding of the following topics to the satisfaction of the SDE:

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(i) the scope and depth of technical airworthiness authority assigned by the TAA to the ATO and other organizations within the DSN;

(ii) the airworthiness responsibilities of the ATO for work that is accomplished by both the organization and external agencies through support arrangements;

(iii) the responsibilities of a DE;

(iv) the responsibilities associated with the authorized technical airworthiness functions;

(v) the EPM for the ATO, including associated procedures; and

ADVISORY NOTE

Prior to being assigned technical airworthiness authority, a DE needs to have acceptable knowledge of the EPM, including core engineering procedures. The TAA will evaluate the DE's knowledge during on-site audits.

(vi) the interrelationship and interfaces between Technical Airworthiness Program and quality management system requirements.

(b) **Skills.** The DE must be skilled in the following:

i. interpreting organizational airworthiness policy;

ii. assessing design change category for routine engineering and technical support activities; and

iii. auditing, and developing and implementing corrective action plans.

(c) **Experience.** A DE shall have either two years of engineering experience within the ATO; or, three years of maintenance experience, and at least six months of engineering experience within the ATO.

ADVISORY NOTE

A DE who does not meet the experience criteria can still be authorized to perform Life Cycle Materiel Management (LCMM) activities, provided that the DE meets the skills, knowledge and experience defined by the organization for LCMM activities.

(2) **DE's Responsibilities.** A DE who performs technical airworthiness functions in support of the design engineering support and/or technical management has the following responsibilities within the limitations and restrictions of the authority assigned by the SDE:

(a) performing the assigned technical airworthiness functions on behalf of the TAA;

(b) ensuring that any issues, problems or service difficulties discovered during airworthiness-related tasks or technical airworthiness functions are referred to the SDE;

(c) advising the SDE of any changes within the ATO that will affect the scope and depth of technical airworthiness authority assigned to the ATO;

(d) interpreting airworthiness standards;

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ADVISORY NOTE

*An airworthiness rule defines exactly **what** must be achieved or accomplished while airworthiness standards specify the **criteria and/or process for the assessment or demonstration of compliance** with the rule. Interpretation of a standard is permitted because there may exist various means of achieving or accomplishing the desired result and demonstrating compliance with the rule. Interpretation of airworthiness rules is not permitted other than by the TAA.*

(e) ensuring the category assigned for engineering and technical support activities is correct;

(f) ensuring adequate engineering competence and independence are applied in the engineering decisions that may affect the airworthiness of an aeronautical product and the airworthiness-related activities and technical airworthiness functions conducted within the ATO;

(g) ensuring that airworthiness reviews are conducted, where appropriate;

(h) participating in internal audits to monitor the engineering competency of individuals and the capability of the organization as a whole, and participating in the development and implementation of corrective action plans; and

(i) in the absence of the SDE, assuming the responsibilities of the SDE for the airworthiness-related activities of the ATO as specifically authorized by the TAA or SDE and within the limitations and restrictions imposed.

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ANNEX B

ACCEPTABLE MANUFACTURING ORGANIZATION (AMFGO)

1. **Eligibility Criteria.** To be deemed acceptable by the TAA as an AMfgO, an organization must meet the requirements stipulated in Section 2 of this chapter (1.4.2).

2. **Manufacturing Process Manual (MfgPM).** To be deemed acceptable by the TAA, an organization must have an Airworthiness Process Manual (APM) that meets the requirements of 1.4.2. The APM within an AMfgO is referred to as a Manufacturing Process Manual (MfgPM). In addition to the requirements stipulated in 1.4.2, the following standards apply:

ADVISORY NOTES

1. *Following the title of each sub paragraph below, the specific section of 1.4.2 is indicated in parentheses.*
2. *Refer to TAA Advisory 2013-02, for additional guidance on the development of an Airworthiness Process Manual and a sample Table of Contents.*

a. **AMfgO Description (see 1.4.2.S1.6.c).** The MfgPM shall provide a description of the AMfgO including the following:

(1) **Facilities and Equipment.** The MfgPM shall describe the following:

(a) the facilities and equipment used by the AMfgO for the manufacture of aeronautical products; and

(b) the location where each aeronautical product will be manufactured, including the aeronautical products or parts thereof which will be manufactured at another facility away from the main production facility.

(2) **Manufacturing-related Activities.** The MfgPM shall provide a summary of the manufacturing-related activities that the AMfgO intends to perform, in accordance with Part 5, Chapter 4.

b. **Technical Airworthiness Function (see 1.4.2.S1.5.f).** The scope and depth of technical airworthiness authority shall be defined for the technical airworthiness function of product conformance that will be performed by authorized personnel within the AMfgO.

c. **Support Arrangements (see 1.4.2.S1.5.d).** The MfgPM shall describe the support arrangements for work performed by other organizations, as follows:

(1) for AMfgO and organizations accredited or recognized by the TAA in accordance with 1.4.2.S1, the AMfgO's MfgPM shall include:

(a) a list of the organizations with a summary of each organization's scope and depth of technical airworthiness authority and a complete list of the aeronautical products being manufactured, including type and model number, for which any technical airworthiness authority has been assigned to that organization;

(b) a description of the process for the specification of tasks to be performed; and

(c) a description of the process for the acceptance of work completed to ensure that the required inspection releases for the tasks performed and the required product conformance certifications are in compliance with the requirements of Part 5, Chapter 4 for the manufacture of aeronautical products.

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(2) for external agencies other than AMfgO and organizations accredited or recognized by the TAA, in accordance with 1.4.2.S1, the AMfgO's MfgPM shall include:

(a) a list of the agencies and the work that they normally perform, and a complete list of the aeronautical products being manufactured, including the type and model number that will be supported by the organization;

(b) a description of the process for the specification of tasks to be performed;

(c) a description of how the AMfgO intends to certify product conformance ensuring that all work shall be performed under the direct supervision of, and certified by, an authorized person from the AMfgO; and

(d) a description of how the AMfgO applies its Quality Management System to the work conducted externally.

(3) a description of the process to be followed by the organization to enter into new, temporary or unforeseen support arrangements.

d. **AMfgO Organization (1.4.2.S1.6.d).** The MfgPM shall provide the title, duties, responsibilities, authorities, and defined eligibility criteria of the persons who perform airworthiness management roles as follows:

(1) **Senior Manufacturing Manager (SMfgM).** The SMfgM is the person identified, in accordance with 1.4.2.S1.5.f(1), to be responsible for the airworthiness-related activities of the AMfgO.

(2) **Personnel Assigned SMfgM Responsibilities.** Those persons assigned responsibilities, in accordance with 1.4.2.S1.5.f(2) to fulfil specific SMfgM responsibilities regarding the airworthiness-related activities of the AMfgO.

(3) **Person Responsible for Assignment of Authority.** The persons identified in accordance with 1.4.2.S1.5.f(3) who authorize other personnel within the AMfgO to perform a technical airworthiness function on behalf of the TAA.

e. **Personnel Authorization Control (see 1.4.2.S1.6.e).** The MfgPM shall provide a description of the system used to authorize personnel to perform the following:

(1) **Manufacturing-related Tasks.** The MfgPM shall describe the system used to authorize personnel to perform the manufacturing and associated inspection release work tasks of the organization. The description shall include the following:

(a) the eligibility criteria defined by the AMfgO, in accordance with 1.4.2.S1.5.g;

(b) the process used to ensure that personnel satisfy the defined eligibility criteria prior to authorization; and

(c) the process used to control authorizations.

(2) **Technical Airworthiness Functions.** The MfgPM shall describe the system used to authorize personnel to perform the technical airworthiness function of product conformance on behalf of the TAA. The description shall include the following:

(a) the eligibility criteria defined by the AMfgO, in accordance with 1.4.2.S1.5.g, to comply with the minimum basic and specific requirements stated in this annex, and the requirements identified by the organization for the technical airworthiness function of product conformance;

(b) the process used to ensure that personnel satisfy the defined eligibility criteria prior to authorization; and

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(c) the process used to control authorizations.

f. **Airworthiness Control System (see 1.4.2.S1.6.g).** When processes are developed as required by these standards, the sum of these processes is referred to as the airworthiness control system. Persons working on aeronautical products shall be made aware of the airworthiness control system in effect within the AMfgO. An AMfgO shall not permit any person to perform work on an aeronautical product unless it is conducted in conformity with the requirements of the airworthiness control system as specified in the TAA-approved MfgPM. In addition, work shall be performed in accordance with the AMfgO-approved procedures manual. The MfgPM shall describe the system used to ensure that all airworthiness-related activities performed by the AMfgO are completed in accordance with the TAM. This shall include, where applicable:

(1) the process to ensure that all manufacturing is performed in accordance with the technical data in the approved type design, including using approved facilities, equipment, processes and approved parts, to ensure that the aeronautical product conforms to the approved type design, in accordance with Part 5, Chapter 4;

(2) if the tasks performed are divided into sub-tasks, the process for sub-task control to ensure that all of the sub-tasks and associated inspection releases are completed prior to the signing of the product conformance;

(3) identification of the approved technical data;

(4) a description of the manufacturing production control system, including:

(a) a description of the process controls during the production stages to ensure that processes are performed under controlled conditions and include documented instructions, workmanship criteria, data, suitable equipment and competent personnel to ensure that the product meets its approved type design;

(b) a description of the inspection and testing process, including receiving, in-process through final inspection and testing, to ensure that all manufacturing and inspection tasks have been completed as planned and documented. The system shall include written instructions for product verification that:

i. establish where, throughout the production cycle, inspections will be performed, including those required at external agencies;

ii. identify the nature of the inspections to be performed; and

iii. establish final inspection procedures for a completed product.

(5) a description of the methods for evaluating and controlling suppliers including a vendor rating system, incoming inspections and tests, incoming documentation and data control and audit of the suppliers; and

(6) description of the methods for the control of non-conforming parts and raw materials, including Material Review Board (MRB) and disposal processes.

g. **Airworthiness Documentation Control System (see 1.4.2.S1.6.h).** The MfgPM shall describe the process used to ensure the accuracy, currency, completeness and availability of the technical data used and generated within the AMfgO to perform its manufacturing-related activities and the technical airworthiness function of product conformance and comply with Part 5, Chapter 5.

3. **Individual Technical Airworthiness Authority.** To be deemed acceptable by the TAA as an AMfgO, an organization must, in accordance with 1.4.2.S1.5.g, define the eligibility criteria for personnel to perform airworthiness management roles and the technical airworthiness function of product conformance on behalf of

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the TAA. The following paragraphs specify the minimum eligibility criteria for this personnel and the typical responsibilities associated with the designated roles.

a. **Senior Manufacturing Manager (SMfgM).** The SMfgM is identified by the CAF unit or company to be responsible for the airworthiness-related activities conducted within the AMfgO. To perform this airworthiness management role, the SMfgM requires the assignment of technical airworthiness authority directly by the TAA. As a designated representative of the TAA, the SMfgM will ensure the airworthiness-related activities of the AMfgO are performed in compliance with the TAM. The SMfgM may also perform technical airworthiness functions on behalf of the TAA.

(1) **SMfgM Eligibility Criteria.** To be eligible for the assignment of technical airworthiness authority directly by the TAA as a SMfgM for the manufacture of aeronautical products, a person must meet the minimum knowledge, skills and experience criteria as listed below:

(a) **Knowledge.** The following knowledge is required:

i. Be a graduate of an applicable engineering discipline from a university recognized by the TAA, or a graduate of an aerospace technology course recognized by the TAA, or, in the opinion of the TAA, have equivalent knowledge and experience;

ii. Have detailed knowledge, gained by formal training and/or work experience pertaining to technical airworthiness rules and standards that were used in the development of the MfgPM.

iii. In the opinion of the TAA, have detailed knowledge, gained by formal training and/or work experience, of the specific aeronautical products involved.

iv. Have a detailed understanding of the airworthiness responsibilities of the AMfgO for work performed by the AMfgO and external agents through maintenance support arrangements.

v. Demonstrate a detailed understanding of the following topics to the satisfaction of the TAA:

ADVISORY NOTE

TAA Advisory 2013-04 provides further guidance on knowledge, skills and experience, as well as topics such as those listed below discussed in the formal interview process.

(i) the scope and depth of technical airworthiness authority assigned by the TAA to the AMfgO,

(ii) the airworthiness responsibilities of the AMfgO for work performed by the AMfgO and external agents through maintenance support arrangements,

(iii) the responsibilities of the role of SMfgM,

(iv) the responsibilities of the persons who have been assigned authority to perform technical airworthiness functions on behalf of the TAA,

(v) the TAA-approved MfgPM for the AMfgO, including associated AMfgO-approved procedures, and

(vi) the interrelationship and interfaces between Technical Airworthiness Program and Quality Management System requirements.

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(b) **Skills.** As applicable for the scope and depth of technical airworthiness authority of the organization, the SMfgM must be skilled in the following and able to demonstrate or provide current and/or past examples regarding the ability to:

i. Correctly interpret airworthiness standards,

ii. Correctly apply airworthiness processes,

iii. Develop processes for the MfgPM that comply with the applicable airworthiness rules and standards,

iv. Evaluate AMfgO procedures for compliance with the TAA-approved MfgPM,

v. Analyze specifications prepared for the development, test and/or technical support of an approved aeronautical product to ensure compliance with the applicable airworthiness rules and standards,

vi. Apply management principles to:

(i) ensure that airworthiness-related activities are conducted in accordance with the TAA-approved MfgPM and the AMfgO-approved procedures,

(ii) ensure that the authorization of personnel performing airworthiness-related tasks and technical airworthiness functions is accomplished in accordance with the TAA-approved MfgPM and the AMfgO-approved procedures,

(iii) monitor the competencies of individuals to whom technical airworthiness authority has been assigned and of the organization as a whole,

(iv) monitor the development and progress of Product Conformance Authority candidates,

(v) evaluate the capabilities of personnel for the assignment of technical airworthiness authority,

(vi) ensure adequate engineering competence is applied in the engineering decisions that may affect the airworthiness of an aeronautical product, and

(vii) ensure that appropriate action is taken to correct any practice or procedure which may compromise the airworthiness of an aeronautical product and/or that the matter is brought to the attention of the TAA.

vii. Issue airworthiness instructions when a non-compliance with airworthiness rules and standards is discovered; and

viii. Communicate with external agencies to:

(i) ensure that contracts or service level agreements are developed and maintained as necessary to enable the AMfgO to provide support and technical management to the aeronautical product,

(ii) ensure work performed by external agencies that are not TAA-accredited or recognized is conducted in accordance with AMfgO-approved procedures.

(c) **Experience.** The SMfgM must have no less than three (3) years of experience in the management of technical activities of similar complexity to those undertaken by the organization.

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(2) **SMfgM's Responsibilities.** A SMfgM within an AMfgO has the following responsibilities within the limitations and restrictions of the technical airworthiness authority assigned by the TAA:

(a) interpreting airworthiness standards, processes and procedures;

(b) ensuring that the process manual for the organization is in compliance with the applicable airworthiness rules and standards;

(c) ensuring that the procedures of the organization are in compliance with the applicable TAA-approved MfgPM and documented in a publication approved within the organization;

(d) ensuring that manufacturing-related tasks and technical airworthiness functions are conducted in accordance with the TAA-approved MfgPM and the AMfgO-approved procedures manual;

(e) ensuring that the authorization of personnel conducting manufacturing-related tasks that may affect the airworthiness of an aeronautical product is in compliance with the TAA-approved MfgPM and the AMfgO-approved procedures manual;

(f) ensuring that the authorization of personnel conducting the technical airworthiness function of product conformance on behalf of the TAA is in compliance with the TAA-approved MfgPM and the AMfgO-approved procedures manual;

(g) taking action to correct any practice or procedure that may compromise the airworthiness of an aeronautical product or draw the matter to the attention of the TAA, advising the applicable organizational authorities of actions taken, if the situation is beyond the control of the individual;

(h) notifying the TAA of any procedural difficulties or deficiencies that result from airworthiness rules and standards or TAA-approved processes, making recommendations for rectification and/or improvement and advising the applicable organization authorities of actions taken;

(i) keeping the TAA informed of any significant issues or developments that may adversely impact on the airworthiness of an aeronautical product and advising the applicable organizational authorities of actions taken;

(j) monitoring the competencies of individuals to whom technical airworthiness authority has been assigned and of the organization as a whole, and inform the TAA of any deficiencies, advising the applicable organizational authorities of actions taken;

(k) ensuring that personnel within the organization receive the necessary training and remain knowledgeable and skilled in the conduct of airworthiness-related tasks;

(l) ensuring the manufacture of aeronautical products conducted within the AMfgO is in accordance with the applicable TAA-approved MfgPM and the AMfgO-approved procedures manual;

(m) ensuring the manufacturing control system is implemented for aeronautical products that are manufactured within the AMfgO in accordance with the TAA-approved MfgPM and the AMfgO-approved procedures manual;

(n) removing aeronautical products from production and supply and/or initiating a recall of manufactured products when a non-compliance with airworthiness rules and standards or a non-conformance with the approved type design is discovered;

(o) ensuring any issues, problems or service difficulties discovered during manufacturing-related activities or technical airworthiness functions are referred to the appropriate Type Certificate Holder for the approved type design;

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(p) developing and maintaining a liaison with the Type Certificate Holder for the approved type design to the extent required to meet the manufacturing responsibilities assigned to the AMfgO;

(q) developing and maintaining manufacturing support arrangements with external agents as necessary to enable the AMfgO to provide the scope and depth required to manufacture the applicable aeronautical product;

(r) ensuring work performed by external agencies that are not accredited or recognized by the TAA, in accordance with 1.4.2.R1, is performed in accordance with the AMfgO-approved procedures. The organization is responsible for the tasks to be performed, the quality of work and the satisfaction of airworthiness certifications requirements for the technical airworthiness functions;

(s) advising the TAA of any changes within the AMfgO and manufacturing support arrangements that will impact the scope and depth of technical airworthiness authority assigned to the AMfgO;

(t) authorizing trained, qualified and competent individuals within the AMfgO to perform specific responsibilities of the SMfgM;

(u) authorizing trained, qualified and competent individuals within the AMfgO to assign technical airworthiness authority to other personnel within the AMfgO to conduct the technical airworthiness function of product conformance on behalf of the TAA;

(v) ensuring that the AMfgO is subject to adequate quality oversights for its entire airworthiness scope and depth of authority granted by the TAA;

(w) monitoring the adequacy of the corrective action plan raised to document non-compliance with the TAA-approved or recognized MfgPM and core procedures; and

(x) for periods of absence, authorizing a competent individual within the AMfgO to carry out the duties and responsibilities of SMfgM with whatever limitations and restrictions are deemed necessary and appropriate.

b. **Person Responsible for Assignment of Authority (PRAA).** The person responsible for the assignment of authority is appointed by the SMfgM to be responsible for the assignment of technical airworthiness authority to other individuals within the AMfgO to conduct the technical airworthiness function of product conformance within the AMfgO. In this role, the person responsible for the assignment of authority is an authorized representative of the TAA.

(1) **PRAA Eligibility Criteria.** To be eligible for the assignment of airworthiness authority by the SMfgM, a PRAA must meet the following criteria:

(a) **Knowledge.** In the opinion of the SMfgM, the PRAA must have detailed knowledge, gained by formal training and/or work experience, of the applicable airworthiness rules and standards.

(b) **Skills.** The PRAA must demonstrate a detailed understanding of the following topics to the satisfaction of the SMfgM:

i. the scope and depth of technical airworthiness authority assigned by the TAA to the AMfgO;

ii. the airworthiness responsibilities of the AMfgO for work performed by the AMfgO and external agents through support arrangements;

iii. the responsibilities of the role of the PRAA;

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iv. the responsibilities of persons who have been assigned airworthiness authority to perform the technical airworthiness function of product conformance on behalf of the TAA;

v. the TAA-approved MfgPM for the AMfgO, including associated AMfgO-approved procedures; and

vi. the interrelationship between Technical Airworthiness Program and Quality Management System requirements.

(c) **Experience.** The person responsible for the assignment of authority must:

i. have no less than three (3) years of relevant and progressively more responsible aerospace manufacturing experience, of which at least two (2) in the supervision of manufacturing of aeronautical products; and

ii. have held signing authority for a product conformance certification.

(2) **PRAA Responsibilities.** A person responsible for the assignment of authority within an AMfgO has the following responsibilities within the limitations and restrictions of the authority assigned by the SMfgM:

(a) ensuring any issues, problems or service difficulties discovered during manufacturing of aeronautical products are referred to the SMfgM;

(b) advising the SMfgM of any changes within the AMfgO that will impact the scope and depth of technical airworthiness authority assigned to the AMfgO;

(c) monitoring internal and external audit observations with respect to the manufacturing competency of individuals and the capability of the organization as a whole, and participating in the development and implementation of the associated corrective action plans;

(d) authorizing trained, qualified and competent individuals within the organization to perform the technical airworthiness function of product conformance; and

(e) for periods of absence, recommending a competent individual within the organization to the SMfgM to carry out the duties and responsibilities of a PRAA with whatever limitations and restrictions are deemed necessary and appropriate.

c. **Product Conformance Authority (PCA).** A person is assigned authority within an AMfgO to conduct the technical airworthiness function of product conformance in accordance with Part 5, Chapter 4, on an aeronautical product that is in the control and custody of the AMfgO.

(1) **PCA Eligibility Criteria.** To be eligible for the assignment of product conformance authority, a person must meet the following minimum knowledge, skills and experience criteria:

(a) **Knowledge.** The following knowledge is required:

i. be a graduate of an applicable technology course recognized by the TAA, or, in the opinion of the TAA, have equivalent knowledge and experience;

ii. in the opinion of the PRAA, have detailed knowledge, gained by formal training and/or work experience, of the applicable airworthiness rules and standards; and

iii. in the opinion of the PRAA, have detailed knowledge and understanding of product conformance responsibilities, as detailed in 5.4.2.S7.3.

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(b) **Skills.** The PCA must demonstrate, to the satisfaction of the PRAA, the ability to analyze situations and make sound airworthiness-related decisions on a variety of different scenarios, covering but not limited to:

i. inspection methods;

ii. inspection results; and

iii. non-conforming parts.

(c) **Experience.** For product conformance authority, a person shall have no less than three (3) years of relevant and progressively more responsible manufacturing experience, of which at least two (2) in the inspection of manufactured products.

(2) **PCA Responsibilities.** A person assigned PCA by the PRAA within an AMfgO is responsible for ensuring compliance with 5.4.2.R7.

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ANNEX C

ACCEPTABLE MAINTENANCE ORGANIZATION (AMO)

1. **Eligibility Criteria.** To be deemed acceptable by the TAA as an Acceptable Maintenance Organization (AMO), an organization must meet the requirements stipulated in Section 2 of this chapter (1.4.2).

2. **Maintenance Process Manual.** To be deemed acceptable by the TAA, an organization must have an Airworthiness Process Manual (APM) that meets the requirements of 1.4.2. The APM within an AMO is referred to as a Maintenance Process Manual (MPM). In addition the requirements stipulated in 1.4.2, the following standards apply:

ADVISORY NOTES

1. *Following the title of each sub paragraph below, the specific section of 1.4.2 is indicated in parentheses.*
2. *Refer to TAA Advisory 2013-02, for additional guidance on the development of an Airworthiness Process Manual and a sample Table of Contents.*

a. **AMO Description (see 1.4.2.S1.6.c).** The MPM shall provide a description of the AMO, including the following:

(1) **Facilities and Equipment.** The MPM shall:

(a) describe the facilities and equipment used by the AMO for the conduct and/or control of maintenance, including a description, the location and the level of work for each aeronautical product;

(b) address provisions for work that will be accomplished outdoors, paying particular attention to environmental factors, including the requirements stipulated in 3.1.2.S2.5; and

(c) address work to be conducted at another facility away from the main operating facility, such as on deployment.

(2) **Maintenance-related Activities.** The MPM shall provide a summary of the scope and depth of maintenance-related activities that the AMO intends to conduct in accordance with Part 3, Chapter 1, including:

(a) servicing;

(b) elementary work;

(c) performance of maintenance, including specialized and non-specialized maintenance, where applicable, as defined in the appendix to this annex; and

(d) control of maintenance.

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ADVISORY NOTE

The TAA may accredit or recognize an organization as an Acceptable Maintenance Organization (AMO). Competent personnel within the AMO are authorized as representatives of the TAA to perform assigned airworthiness management roles or technical airworthiness functions on specific aeronautical products. Personnel within an AMO perform these technical airworthiness functions in one or a combination of the following maintenance-related activities:

a. ***Servicing.*** *Servicing of an aeronautical product as described in Part 3, Chapter 1, involves tasks that do not either require disassembly of the aeronautical product or affect airworthiness. Servicing includes tasks related to cleaning, lubricating, fluid replenishment and ground handling of an aeronautical product.*

b. ***Elementary Work.*** *Elementary work on an aeronautical product as described in Part 5, Chapter 3, involves simple tasks that do not affect the airworthiness of an aeronautical product. Elementary work may include tasks related to the opening and closing of access panels, replacement of fuses and light bulbs, and repair and replacement of upholstery and cabin furnishings.*

c. ***Conduct of Maintenance.*** *The conduct of maintenance on an aeronautical product as described in Part 3, Chapter 1, involves the performance, verification, recording and airworthiness certification of maintenance tasks on an aeronautical product. The performance of maintenance includes inspection, troubleshooting and fault isolation, repair, overhaul, calibration, testing, and conditioning as specified in the approved maintenance program for the aeronautical product.*

d. ***Control of Maintenance.*** *The control of maintenance as described in Part 3, Chapter 1, involves the administrative actions involved in the scheduling of maintenance within the time constraints specified in the approved maintenance program, defect deferral control and the maintenance of the Technical Record for an aeronautical product.*

(3) If the scope of maintenance-related activities involves on-aircraft non-specialized maintenance, the eligibility criteria for an individual to perform that scope and the depth of maintenance to be performed must be clearly stated;

(4) If the scope of maintenance-related activities involves off-aircraft maintenance, the eligibility criteria for an individual to perform that scope and the depth of maintenance to be performed, including the type and model number of every component, must be clearly stated and must be broken down into logical categories and sub-categories, as required:

(5) If the scope of maintenance-related activities involves specialized maintenance as described in the appendix to this annex, the eligibility criteria for an individual to perform that scope and the depth of maintenance to be performed, and to which standard, must be clearly stated.

b. **Technical Airworthiness Functions.** The scope and depth of technical airworthiness authority shall be defined for each technical airworthiness function required to support the maintenance-related activities defined in 1.4.2C.2.a(2) to 1.4.2C.2.a(5), which will be performed by authorized personnel within the AMO, including:

(1) Maintenance Release Authority (MRA), consisting of Aircraft Certification Authority (ACA) and Shop Certification Authority (SCA); and

(2) Aircraft Release Authority (ARA).

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c. **Support Arrangements (see 1.4.2.S1.5.d.).** The MPM shall describe the support arrangements for work performed by other organizations for the aeronautical product as follows:

(1) for AMO and organizations accredited or recognized by the TAA in accordance with 3.1.2.S1, the AMO's MPM shall include:

(a) a list of the organizations, with a summary of each organization's scope and depth of technical airworthiness authority, and a complete list of the aeronautical products and applicable components, including type and model number, for which any technical airworthiness authority has been assigned to that organization;

(b) a description of the process for the specification of tasks to be performed, for the exchange of applicable technical data and for the acceptance of the completed work; and

(c) a description of the process that the SMM will use to determine whether the organization meets the criteria of 3.1.2.S1.

(2) for external agencies other than AMO and organizations accredited or recognized by the TAA in accordance with 1.4.2.R1, the AMO's MPM shall include:

(a) a list of the agencies and the work that they normally perform, and a complete list of the aeronautical products and applicable components, including the type and model number that will be supported by the organization;

(b) a description of the process for the specification of tasks to be performed, for the exchange of applicable technical data and for the acceptance of the completed work;

(c) a description of how the AMO intends to certify the assigned maintenance action ensuring that all work shall be performed under the direct supervision of, and certified by, an authorized person from the AMO for the aeronautical product; and

(d) a description of how the AMO applies its quality management system to the work conducted externally.

d. **AMO Organization (see 1.4.2.S1.6.d).** The MPM shall provide the title, responsibilities, authorities and defined eligibility criteria of the persons who perform airworthiness management roles in the AMO, as follows:

(1) **Senior Maintenance Manager (SMM).** The SMM is the person identified in accordance with 1.4.2.S1.5.f(1), to be responsible for the airworthiness-related activities of the AMO.

(2) **Persons Assigned SMM Responsibilities.** Those persons assigned responsibilities in accordance with 1.4.2.S1.5.f(3), to fulfill specific SMM responsibilities regarding the airworthiness-related activities of the AMO.

ADVISORY NOTE

The minimum eligibility criteria for persons listed in 1.4.2C.2.d(2), would normally be the applicable criteria listed for the SMM.

(3) **Persons Responsible for Assignment of Authority (PRAA).** The persons identified in accordance with 1.4.2.S1.5.f(2), who authorize other personnel within the AMO to perform technical airworthiness functions of aircraft release and maintenance release on behalf of the TAA.

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e. **Personnel Authorization Control (see 1.4.2.S1.6.e).** The MPM shall provide a description of the system used to authorize personnel to perform the following:

(1) **Maintenance-related Tasks.** The MPM shall describe the system used to authorize personnel to perform the maintenance, servicing, and elementary work tasks of the AMO. The description shall include the following:

(a) the eligibility criteria defined by the AMO in accordance with 1.4.2.S1.5.g, for servicing, elementary work and maintenance tasks;

(b) the process used to ensure personnel satisfy the defined eligibility criteria prior to authorization; and

(c) the process used to control authorizations.

(2) **Technical Airworthiness Functions.** The MPM shall describe the system used to authorize personnel to perform technical airworthiness functions on behalf of the TAA. The description shall include the following:

(a) the eligibility criteria defined by the AMO in accordance with 1.4.2.S1.5.g to comply with the minimum basic and specific requirements specified by this annex and the requirements identified by the organization for the technical airworthiness functions of maintenance release and aircraft release;

(b) the process used to ensure personnel satisfy the defined eligibility criteria prior to authorization; and

(c) the process used to control authorizations.

ADVISORY NOTE

The personnel records which demonstrate that an individual meets these criteria may be recorded in another document and made available to the TAA upon request.

f. **Airworthiness Control System (see 1.4.2.S1.6.g).** The MPM shall describe the processes used to ensure that all servicing, elementary work and maintenance tasks, and technical airworthiness functions performed by the AMO are completed in accordance with the Maintenance Process Manual. This shall include, where applicable:

(1) the process to ensure that all work on aeronautical products is performed in accordance with the approved maintenance program and the requirements of Part 3, Chapter 1 using approved facilities, equipment and replacement parts to ensure that the aeronautical product remains in conformance with the approved type design;

ADVISORY NOTE

The airworthiness rules and standards for the conduct and control of maintenance on aeronautical products are included in Part 3, Chapter 1.

(2) if a maintenance task is divided into sub-tasks, the process for sub-task control to ensure that all of the sub-tasks are completed prior to the signing of a maintenance release in respect of the completion of the maintenance task;

(3) identification of the approved maintenance program, including the associated maintenance schedule and maintenance procedures;

(4) a description of the maintenance control system in accordance with 3.1.2.S1;

(5) the process for obtaining engineering support from an ATO;

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ADVISORY NOTE

Engineering support can include activities such as:

a. *obtaining flight permits, as described in Part 5, Chapter 7;*

b. *deviations from the TCH-approved maintenance program, as per 3.1.2.S1;*

c. *recurring defect resolution, if applicable, as per 3.1.2.S1;*

d. *recommendations regarding limitations and conditions, as per 3.1.2.S5;*

e. *specific direction from the TCH, as per 3.1.2.S1, including:*

(1) *modifications;*

(2) *special inspections and airworthiness directives; and*

(3) *deviations from the approved maintenance program.*

f. *parts substitution, in accordance with 3.1.2.S7; or*

g. *TCH-directed action for abnormal occurrences in accordance with 3.1.2.S3.*

(6) the process for managing the technical record, as defined in Part 5, Chapter 5;

(7) the process for the robbing of parts, in accordance with 3.1.2.S6;

(8) the process for the removal and replacement of aircraft identification plates, in accordance with Part 5, Chapter 8;

(9) the process for procuring parts, in accordance with Part 5, Chapter 2; and

(10) the process for disposing of parts in accordance with Part 4, Chapter 1.

3. **Individual Technical Airworthiness Authority.** To be deemed acceptable as an AMO, an organization must, in accordance with 1.4.2.S1.5.g, define the eligibility criteria for personnel to perform airworthiness management roles and technical airworthiness functions on behalf of the TAA. The following paragraphs specify the minimum eligibility criteria for this personnel and the typical responsibilities associated with the designated roles.

a. **Senior Maintenance Manager (SMM).** The SMM is identified by the CAF unit or company to be responsible for the airworthiness-related activities conducted within the AMO. To perform this airworthiness management role, the SMM requires the assignment of technical airworthiness authority by the TAA. As a designated representative of the TAA, the SMM will ensure the airworthiness-related activities of the AMO are performed in compliance with the TAM. The SMM may, if the individual meets the appropriate eligibility criteria, also perform technical airworthiness functions on behalf of the TAA.

ADVISORY NOTES

1. *The assignment of authority will be made by letter following TAA assessment of the prospective SMM's competence, as per 1.4.2C.3.a(1).*

2. *The SMM is not attached to any particular position within the CAF unit or company, but rather is a role that must be performed by the most suitable individual available, considering the scope and depth of airworthiness authority of the AMO.*

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3. *For example, the SMM need not be the head of the CAF unit or company or the head of maintenance production within the CAF unit or company. The role could be assigned to the deputy head of maintenance production, provided the head of the CAF unit or company makes a commitment that the appointed SMM has the necessary powers to control the airworthiness-related activities within the AMO. This could include activities, such as removing an aircraft from flying status, if it is considered non-airworthy, and approval of airworthiness-related procedures within the AMO procedures manual.*

(1) **SMM Eligibility Criteria.** To be eligible for the assignment of technical airworthiness authority directly by the TAA as a SMM, a person must meet the minimum knowledge, skills and experience criteria, as listed below:

(a) **Knowledge.** The following knowledge is required:

i. Be a graduate of an engineering discipline from a university recognized by the TAA, or be a graduate of an aerospace technology course recognized by the TAA, or, in the opinion of the TAA, have equivalent knowledge and experience.

ii. Have detailed knowledge, gained by formal training and/or work experience pertaining to technical airworthiness rules and standards that were used in the development of the MPM.

iii. In the opinion of the TAA, have detailed knowledge, gained by formal training and/or work experience, of the specific aeronautical products being maintained by the AMO, including any airworthiness limitations.

iv. Demonstrate a basic understanding of the Airworthiness Review Board (ARB) process.

v. Demonstrate a detailed understanding of the following topics to the satisfaction of the TAA:

ADVISORY NOTE

TAA Advisory 2013-04 provides further guidance on knowledge, skills and experience, as well as topics such as those listed below which will be discussed in the formal interview process.

(i) the scope and depth of technical airworthiness authority assigned by the TAA to the AMO;

(ii) the airworthiness responsibilities of the AMO for work performed by the AMO and external agencies through maintenance support arrangements;

(iii) the responsibilities of the role of SMM;

(iv) the responsibilities of the PRAA;

(v) the responsibilities of the persons who have been assigned authority to perform technical airworthiness functions on behalf of the TAA and applicable eligibility criteria;

(vi) the MPM for the AMO, including associated procedures;

(vii) the interrelationship and interfaces between the Technical Airworthiness Program and Quality Management System requirements.

(b) **Skills.** As applicable for the scope and depth of technical airworthiness authority of the organization, the SMM must be skilled in the following areas and able to demonstrate or provide current and/or past examples regarding the ability to:

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i. Correctly interpret airworthiness standards.

ii. Correctly apply airworthiness processes.

iii. Develop processes for inclusion in the MPM that are in compliance with the applicable airworthiness rules and standards.

iv. Evaluate AMO procedures for compliance with the TAA-approved MPM.

v. Apply management principles to:

(i) ensure that airworthiness-related activities are conducted in accordance with the TAA-approved MPM and the AMO-approved procedures;

(ii) ensure that the authorization of personnel performing airworthiness-related tasks and technical airworthiness functions is accomplished in accordance with the TAA-approved MPM and the AMO-approved procedures;

(iii) monitor the competencies of individuals to whom technical airworthiness authority has been assigned and of the organization as a whole;

(iv) monitor the development and progress of ARA and MRA candidates;

(v) evaluate the capabilities of personnel for the assignment of technical airworthiness authority;

(vi) ensure adequate competence is applied in the maintenance decisions that may affect the airworthiness of an aeronautical product;

(vii) ensure that appropriate action is taken to correct any practice or procedure which may compromise the airworthiness of an aeronautical product and/or that the matter is brought to the attention of the TAA.

vi. Issue airworthiness instructions when a non-compliance with airworthiness rules and standards or a non-conformance with the approved type design is discovered.

vii. Communicate with external agencies to:

(i) ensure that contracts or service level agreements are developed and maintained as necessary to enable the AMO to provide the scope and depth of maintenance and technical management required;

(ii) ensure work performed by external agencies that are not deemed TAA-acceptable is conducted in accordance with AMO-approved procedures.

(c) **Experience.** The SMM must have no less than six (6) years of relevant and progressively more responsible aerospace engineering and maintenance experience of which two (2) years in the maintenance of aeronautical products.

(2) **SMM's Responsibilities.** A SMM within an AMO has the following responsibilities within the limitations and restrictions of the technical airworthiness authority assigned by the TAA:

(a) interpreting airworthiness standards and processes;

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ADVISORY NOTE

An airworthiness rule defines exactly what must be achieved or accomplished while airworthiness standards specify the criteria and/or process for the assessment or demonstration of compliance with the rule. Interpretation of a standard is permitted because there may exist various means of achieving or accomplishing the desired result and demonstrating compliance with the rule. Interpretation of airworthiness rules is not permitted other than by the TAA.

(b) ensuring that the process manual for the organization is in compliance with the applicable airworthiness rules and standards;

(c) ensuring that the procedures of the organization are in compliance with the applicable TAA-approved MPM and documented in a publication approved within the organization;

(d) ensuring that maintenance-related tasks and technical airworthiness functions are conducted in accordance with the TAA-approved MPM and the AMO-approved procedures manual, or submitting a request for a deviation to the TAA, in accordance with 1.4.2.S1.9;

(e) ensuring that the authorization of personnel conducting maintenance-related activities that may affect the airworthiness of an aeronautical product is in compliance with the TAA-approved MPM and the AMO-approved procedures manual;

(f) ensuring that the authorization of personnel conducting technical airworthiness functions on behalf of the TAA is in compliance with the TAA-approved MPM and the AMO-approved procedures manual;

(g) revoking the authorization of personnel;

(h) taking action to correct any practice or procedure that may compromise the airworthiness of an aeronautical product or draw the matter to the attention of the TAA, advising the applicable organizational authorities of actions taken, if the situation is beyond the control of the individual;

(i) notifying the TAA of any procedural difficulties or deficiencies that result from airworthiness rules and standards or TAA-approved processes, making recommendations for rectification and/or improvement and advising the applicable organizational authorities of actions taken;

(j) keeping the TAA informed of any significant issues or developments that may adversely impact on the airworthiness of an aeronautical product and advising the applicable organizational authorities of actions taken;

(k) monitoring the competencies of individuals to whom technical airworthiness authority has been assigned and of the organization as a whole and inform the TAA of any deficiencies, advising the applicable organizational authorities of actions taken;

(l) ensuring that personnel within the organization remain knowledgeable and skilled in the conduct of airworthiness-related activities;

(m) ensuring the maintenance conducted within the AMO is in accordance with the applicable TAA-approved MPM and the AMO-approved procedures manual;

(n) ensuring the maintenance control system is implemented for aeronautical products within the control and custody of the AMO in accordance with the TAA-approved MPM and the AMO-approved procedures manual;

(o) removing aeronautical products from operational service when a non-compliance with airworthiness rules and standards or a non-conformance with the approved type design is discovered;

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ADVISORY NOTE

For an aircraft, a non-compliance or non-conformance may invalidate the flight authority which had previously been granted to permit the operation of the specific aircraft until the deficiency is corrected.

(p) ensuring any issues, problems or service difficulties discovered during maintenance-related activities or technical airworthiness functions are referred to the appropriate Type Certificate Holder (TCH) for the approved type design;

(q) developing and maintaining a liaison with the TCH for the approved type design to the extent required to meet the maintenance responsibilities assigned to the AMO;

(r) developing and maintaining maintenance support arrangements with external agents as necessary to enable the AMO to provide the scope and depth of maintenance required;

(s) ensuring work performed by external agents, who are not accredited or recognized by the TAA, in accordance with 1.4.2.R1, is conducted in accordance with the TAA-approved MPM and AMO-approved procedures (the AMO is responsible for the tasks to be performed, the quality of work and the satisfaction of airworthiness certification requirements for the technical airworthiness functions);

(t) advising the TAA of any changes within the AMO and/or to maintenance support arrangements that will impact the scope and depth of technical airworthiness authority assigned to the AMO and submitting appropriate changes to the MPM for TAA approval;

(u) authorizing trained, qualified and competent individuals within the AMO to perform the specific responsibilities of the SMM;

(v) ensuring the AMO is subject to adequate quality oversights for its entire airworthiness scope and depth of authority granted by the TAA;

(w) monitoring the adequacy of the corrective action plan raised to document non-compliances with the TAA-approved or recognized MPM and core procedures;

(x) authorizing trained, qualified and competent individuals within the AMO to assign technical airworthiness authority to other personnel within the AMO to conduct technical airworthiness functions on behalf of the TAA;

ADVISORY NOTE

The SMM may assign airworthiness authority to individuals within an AMO to perform the technical airworthiness functions of maintenance release and aircraft release in circumstances where there is a justifiable requirement for the SMM to do so.

(y) ensuring that there is, at all times, someone available to carry out the SMM responsibilities; and

(z) during the SMM's absence, formally authorizing a competent individual within the AMO to assume the technical responsibilities as acting SMM (A/SMM). This must be completed by letter, fax or e-mail, and must list any restrictions and/or limitations to that authority, subject to the following limitations:

i. Acting SMM roles may not last beyond four (4) months without TAA approval, and the SMM must notify the TAA in circumstances where the SMM is permanently leaving the AMO or leaving for an extended period of time; and

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ii. Acting SMMs cannot issue authorizations to individuals to perform airworthiness functions within the AMO.

b. **Person Responsible for Assignment of Authority (PRAA).** The person responsible for the assignment of authority is appointed by the SMM to be responsible for the assignment of technical airworthiness authority to other individuals within the AMO to conduct the technical airworthiness functions of aircraft release and maintenance release within the AMO. In this airworthiness role, the PRAA is an authorized representative of the TAA.

ADVISORY NOTE

The PRAA is not attached to any particular position within the CAF unit or company, but rather is a role that must be performed by the most suitable individual or individuals available, considering the scope and depth of airworthiness authority of the AMO and the aeronautical products.

(1) **PRAA Eligibility Criteria.** To be eligible for the assignment of airworthiness authority by the SMM as PRAA, a person must meet the following criteria:

ADVISORY NOTES

1. *In accordance with 1.4.2.S1.5.g, an AMO defines, in compliance with the following criteria, the knowledge, skills and experience eligibility criteria necessary for the organization's scope and depth of assigned technical airworthiness authority on the particular aeronautical products involved. These defined eligibility criteria are detailed in the MPM, in accordance with 1.4.2.S1.6.d. This may include specific courses or experience required to comply with the following criteria, as applicable.*

2. *An AMO may require more than one PRAA, depending on the organizational structure and the number of different types of aeronautical products involved.*

(a) **Knowledge.** In the opinion of the SMM, the PRAA must have detailed knowledge, gained by formal training and/or work experience, of the applicable airworthiness rules and standards.

(b) **Skills.** The PRAA must be able to demonstrate a detailed understanding of the following topics to the satisfaction of the SMM:

i. the scope and depth of technical airworthiness authority assigned by the TAA to the AMO;

ii. the airworthiness responsibilities of the AMO for work performed by the AMO and external agents through maintenance support arrangements;

iii. the responsibilities of the role of the PRAA;

iv. the responsibilities of persons who have been assigned airworthiness authority to perform technical airworthiness functions on behalf of the TAA;

v. the TAA-approved MPM for the AMO, including associated AMO-approved procedures; and

vi. the interrelationship between the Technical Airworthiness Program and Quality Management System requirements.

(c) **Experience.** The PRAA must have held:

i. Maintenance Release Authority (MRA) for a minimum of four (4) years, if the work performed by the personnel to be authorized is limited to components; or

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ii. Aircraft Release Authority (ARA) for a minimum of four (4) years on an aircraft type, if the work performed by the personnel to be authorized includes the aircraft.

ADVISORY NOTES

1. *A PRAA whose experience is limited to paragraph 3.b.(1).(c).i. above, may only be authorized to grant airworthiness functions as a Shop Certification Authority (SCA).*

2. *It is the SMM's responsibility to assess the competence of the prospective PRAA regardless of the experience the individual may have. The purpose in setting the experience minimum above is to ensure that only highly experienced personnel are considered for the PRAA position. There may be cases where an AMO feels that the skill and knowledge of their technicians is very high due to the employment strategy the organization uses. For example, all ARA technicians employed may also be exercising Aircraft Certification Authority (ACA) privileges. In these cases, the SMM can document in their MPM an alternative means of compliance to the four-year ARA experience and seek TAA approval. There may also be unique circumstances where an organization's MPM complies with the four-year ARA experience requirement, but the SMM feels that a candidate who does not meet the requirements of the MPM should be appointed to the position of PRAA. In these cases, the SMM may apply to the TAA for a waiver from their MPM.*

(2) **PRAA Responsibilities.** A PRAA within an AMO has the following responsibilities within the limitations and restrictions of the authority assigned by the SMM:

(a) ensuring any issues, problems or service difficulties discovered during the maintenance of aeronautical products are referred to the SMM;

(b) advising the SMM of any changes within the AMO that impact the scope and depth of technical airworthiness authority assigned to the AMO;

(c) monitoring internal and external audit observations and non-compliances with respect to the maintenance competency of individuals and the capability of the organization as a whole, and participating in the development and implementation of corrective action plans;

(d) revoking the authorization of personnel in accordance with the requirements of 1.4.2C.4; and

(e) authorizing trained, qualified and competent individuals within the organization to perform the technical airworthiness functions of aircraft release and maintenance release;

(f) for periods of absence, recommend a competent individual within the organization to the SMM to carry out the duties and responsibilities of the PRAA with whatever limitations and restrictions are deemed necessary and appropriate.

c. **Aircraft Release Authority (ARA).** A person is assigned ARA by the PRAA within an AMO to conduct the technical airworthiness function of aircraft release, in accordance with Part 3, Chapter 1, on an aeronautical product in the control and custody of the AMO.

(1) **ARA Eligibility Criteria.** To be eligible for the assignment of ARA, a person must meet the following minimum knowledge, skills and experience criteria:

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ADVISORY NOTE

In accordance with 1.4.2.S1.5.g, an AMO defines, in compliance with the following criteria, the ARA knowledge, skills and experience eligibility criteria necessary for the organization's scope and depth of assigned technical airworthiness authority on the particular aeronautical products involved. These defined eligibility criteria are detailed in the MPM in accordance with 1.4.2.S1.6.d. This may include specific courses or experience required to comply with the above minimum criteria, as applicable to the scope and depth of assigned ARA.

(a) **Knowledge.** The following knowledge is required:

i. in the opinion of the PRAA, have detailed knowledge, gained by formal training and/or work experience, of the applicable airworthiness rules and standards;

ii. in the opinion of the PRAA, have detailed knowledge and understanding of ARA responsibilities, as detailed in 3.1.2.S11; and

iii. demonstrate a detailed understanding of the MPM for the AMO, including associated procedures.

(b) **Skills.** The ARA must be able to demonstrate, to the satisfaction of the person responsible for the assignment of authority, the ability to analyze situations and make sound airworthiness-related decisions given a variety of different scenarios covering ARA responsibilities, as detailed in 3.1.2.S11. Examples include:

i. deferred defects;

ii. recurring defects;

iii. deviations to the approved maintenance program;

iv. servicing and elementary work;

v. flight tests;

vi. weight and balance;

vii. flight authority;

viii. scheduled maintenance; and

ix. MRA responsibilities.

(c) **Experience.** For ARA, the following experience requirements apply:

i. the individual must have held Aircraft Certification Authority (ACA) for an aircraft type that has been issued a type certificate by the TAA or an airworthiness authority recognized by the TAA for a minimum of four (4) years;

ADVISORY NOTE

An AMO may identify in their MPM additional experience criteria that make provisions for the organization to evaluate engineering experience in lieu of four years of ACA experience. In these cases, there would still be an expectation that an engineer being granted ARA would meet the knowledge and skill requirements identified above and have suitable experience in the supervision of maintenance for the aircraft type involved.

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ii. if holding ARA for the first time, the individual shall possess no less than two (2) years of experience in the performance or supervision of maintenance on the aircraft type involved. If the AMO utilizes formal training methods, this requirement may be decreased by a maximum of one year; and

iii. if transferring between aircraft types, an individual who previously held ARA shall possess no less than one year of experience in the performance or supervision of maintenance on the new aircraft type involved. If the AMO utilizes formal training methods, this requirement may be decreased by a maximum of six (6) months.

ADVISORY NOTES

1. *The intent of the on-type experience requirement is to ensure that individuals have obtained a thorough experience and detailed knowledge of the applicable approved maintenance program, system interrelationship, aircraft peculiarities and the AMO maintenance control system. Formal training methods, such as an aircraft releaser course and/or a structured On-the-Job Training (OJT) program, may be used to facilitate the acquisition of the required knowledge and experience. Credit towards decreasing on-type experience requirements will be assessed and approved by the TAA on a case-by-case basis, taking into account the content and comprehensiveness of the training. Formalized training and eligibility requirements, once approved by the TAA, shall subsequently be incorporated into the MPM for an AMO.*

2. *Upon joining an AMO, a technician who previously held ARA on the aircraft type may be granted ARA after the PRAA is satisfied that the individual is ready to assume this authority in the new organization. However, care must be taken not to automatically grant an authorization based on previously held authority on the same aircraft type. The person responsible for the assignment of authority must ensure factors, such as training standards, experience, differences in scope and depth of authority and inexperience in the new AMO are accounted for, prior to granting the authorization.*

3. *For an AMO involved with the introduction of a new aircraft type into service or for small AMOs, it may not be possible to find an individual with the required two-year on-type experience. In these cases, the TAA may authorize a temporary deviation to the two-year on-type experience requirement if the AMO demonstrates that the intent of the requirement has been met through formal training, OJT or previous experience on similar aircraft types or a combination thereof.*

4. *An MPM may have provisions for a "servicing and elementary work ARA" that relaxes the ARA eligibility criteria specified in 1.4.2C.3.c(1), and permits authorized aircrew to perform ARA following servicing or elementary work on a deployment away from the AMO. If so, the provisions in the MPM shall include:*

   a. *A process for the performance of "servicing and elementary work ARA" by authorized aircrew on deployment that ensures:*

      (1) no maintenance tasks have been performed; and

      (2) compliance with the ARA responsibilities specified in 3.1.2.S11.

   b. *the training, qualification and authorization of aircrew within the personnel authorization control system of the AMO as described, in accordance with 1.4.2C.2.e.*

(2) **ARA's Responsibilities.** A person assigned ARA by a PRAA within an AMO is responsible for ensuring compliance with 3.1.2.S11.

d. **Maintenance Release Authority (MRA).** A person is assigned MRA by the PRAA within an AMO to conduct the technical airworthiness function of maintenance release, in accordance with Part 3, Chapter 1.

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ADVISORY NOTES

1. *There are two types of Maintenance Release Authority (MRA) described as follows:*

   a. ***Aircraft Certification Authority (ACA).*** *A person is authorized to sign a maintenance release in respect of work performed on an aircraft.*

   b. ***Shop Certification Authority (SCA).*** *A person is authorized to sign a maintenance release in respect of work performed on an uninstalled aeronautical product.*

2. *In accordance with 3.1.2.S10, a maintenance release is not required following the completion of servicing and elementary work provided the task was performed by a person authorized in accordance with the personnel authorization control process described in 1.4.2C.2.e.*

3. *An MPM may include provisions to allow the "pilot-in-command" of an aircraft to perform "pre", "post" and "through" flight inspections and sign the associated maintenance release if required (a maintenance release is required when any of the tasks are not defined as elementary work in the approved maintenance program for the aircraft), provided that:*

   a. *The "pilot-in-command" has been authorized in accordance with the MPM to accomplish these tasks and perform a maintenance release;*

   b. *the aircraft is deployed and there are no authorized technicians available to accomplish these tasks and perform maintenance release; and*

   c. *the MPM contains provisions for annual refresher training to maintain currency of the "pilot-in-command".*

(1) **ACA Eligibility Criteria.** The minimum acceptable levels of knowledge, skills and experience for a person to be assigned ACA are as follows:

ADVISORY NOTES

1. *In accordance with 1.4.2.S1.5.g, an AMO defines, in compliance with the following criteria, the ACA knowledge, skills and experience eligibility criteria necessary for the organization's scope and depth of assigned technical airworthiness authority on the particular aeronautical products involved. These defined eligibility criteria are detailed in the MPM in accordance with 1.4.2.S1.6.d. This may include specific courses or experience required to comply with the above minimum criteria, as applicable to the scope and depth of assigned ACA. It is important, for an AMO, to augment minimum criteria for tasks that are complex in nature and are not deemed to be part of the normal training curriculum obtained within the basic or on-type course as defined below. These also include any specialized maintenance tasks as defined within Appendix 1 to this annex.*

2. *Upon joining an AMO, a technician who previously held ACA on the aircraft type may be granted ACA after offering satisfactory proof to the PRAA that they are ready to assume this authority in the new organization. However, care must be taken not to automatically grant an authorization based on previously held authority on the same aircraft type. The PRAA must ensure factors such as training standards, experience, differences in scope and depth of authority, inexperience in the new AMO and knowledge of the organization's MPM and core procedures are accounted for, prior to granting the authorization.*

   (a) **Knowledge.** To demonstrate the required knowledge, the person shall have successfully passed all the examinations administered by the training organization for the following:

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i. **Basic.** The person shall have satisfactorily completed the applicable basic aircraft, avionics or structures maintenance course conducted by a training organization acceptable to the TAA, as specified in 1.4.2C.6. The course shall have a minimum technical training duration of 1 000 hours.

ADVISORY NOTES

1. *More information regarding the content of an acceptable basic course can be found in 566.13 of the Transport Canada Airworthiness Manual.*

2. *The 1 000 hour duration is considered the minimum essential training to ensure that the person has gained broad knowledge of the occupational trade and aviation maintenance in general. While the 1 000 hour duration requirement does not specifically ensure the quality of training, it provides reasonable assurance that the individual will recognize unsafe conditions and practices during the performance of maintenance. Deviations from the 1 000 hour duration requirement may be granted by the TAA if the AMO demonstrates that the intent of the requirement has been met by some other means such as experience, the extent and comprehensiveness of the on-type course or On-the-Job Training.*

3. *The applicability of a basic course that does not meet the minimum of 1 000 hours must be submitted to the TAA for approval.*

4. *A person who completes a basic course that is longer in duration than the 1 000 hour requirement may be entitled to experience credits as required by 1.4.2C.3.d(1)(c) A credit of one month for every 100 hours over the minimum of 1 000 hours may be permitted, to a maximum credit of 24 months.*

ii. **On-type.** The person shall have satisfactorily completed an "on-type course" acceptable to the Type Certificate Holder for the aeronautical product type. The course shall provide no less than five per cent of hands-on training in relation to the course duration. Upon graduation, the person shall be able to:

(i) identify and use the applicable maintenance manuals;

(ii) recall:

1) safety precautions to be observed when working on or near the aircraft and its systems;

2) locations of principal components;

3) normal functions of each major system, including terminology and nomenclature;

4) applicable systems operation and maintenance practices; and

5) procedures for carrying out significant tasks associated with the routine servicing of the aircraft and its systems;

(iii) carry out applicable system and component checks, including functional checks as specified in the applicable maintenance manuals;

(iv) utilize the Minimum Equipment List (MEL), if applicable, interpreting reports provided by crew members and/or on-board reporting systems;

(v) interpret readings and indications provided by Built-in-Test Equipment (BITE) and other information systems;

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(vi) analyze information for the purpose of making decisions with respect to fault diagnosis and rectification contained in the applicable maintenance manuals.

ADVISORY NOTES

1. *The purpose of the hands-on training is to provide real exposure to aircraft maintenance and the interrelationships between systems and components.*

2. *For DND, the evaluation of all on-type courses has been assigned to 1 Cdn Air Div/ A4 Maint.*

iii. **Technical Airworthiness Basic.** Have successfully completed the Basic Airworthiness Exam attaining a minimum score of 70 per cent; and

ADVISORY NOTES

1. *TAA Advisory 2015-01 describes an acceptable means of compliance for the basic airworthiness exam for ACA candidates.*

2. *The TAA has recognized the Canadian Forces Air Maintenance Policy Level 2 course, as equivalent to the Basic Airworthiness Exam.*

iv. **Maintenance Process Manual (MPM).** Demonstrate a detailed understanding of the MPM for the AMO, including associated procedures.

(b) **Skills.** The ACA must be skilled in the following:

i. provide documented proof of having completed a suitable selection of maintenance tasks for the scope of the authority assigned;

ADVISORY NOTES

1. *One acceptable form of documented proof is an aircraft technician log-book, which provides a record of tasks completed and details of training and experience.*

2. *An AMO's MPM should contain clear policies regarding the number and type of tasks that must be completed prior to being granted ACA for a system. Neither the technician nor the PRAA should be left with any doubt as to the minimum requirements.*

3. *A suitable list of tasks may be derived from the Air Transport Association (ATA) or Association Européenne des constructeurs de matériel aérospatial (AECMA) standards or their equivalent.*

4. *The TAA is not making reference to the completion of a logbook that is usually associated with an apprenticeship program. To meet this standard, some AMOs may decide to implement a requirement of a minimum number of months within the organization, after the completion of the individual's apprenticeship program and type course, within his/her trade. However, for tasks that are complex in nature and are not deemed to be part of normal training curriculum, it is the TAA's expectation that the completion of these tasks will be documented officially, providing an auditable trail to both the organization and the TAA.*

ii. each task shall be carried out at least once under the direct supervision of a person who has ACA for the task or comprehensive knowledge of the task and is acceptable to the PRAA;

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ADVISORY NOTES

1. *Depending on the complexity and criticality of a task, it may be determined that some tasks must be performed more than once. The documentary evidence (i.e., logbook) should clearly identify these tasks, indicate the number of times these tasks must be performed and provide the PRAA proof that all tasks have been completed satisfactorily meeting the requirements (the minimum number of times).*

2. *Upon joining an AMO, a technician who previously held ACA on the same aircraft type may be granted ACA after the PRAA is satisfied that the individual is ready to assume this authority in the new organization. However, care must be taken not to automatically grant an authorization based on previously held authority on the same aircraft type. The person responsible for the assignment of authority must ensure factors such as training standards, experience, differences in scope and depth of authority, inexperience in the new AMO, and knowledge of the organization's MPM and core procedures are accounted for prior to granting the authorization.*

3. *In some circumstances, such as the initial start-up of a new AMO or the introduction of a new aircraft type, it may not be possible to comply with all of the provisions of 1.4.2C.3.d(1)(b).i and 1.4.2C.3.d(1)(b).ii. In these cases, it may be acceptable to base authorizations on skill demonstrated on a similar aircraft type. When similar aircraft experience is used as the basis of authorization, the individual being authorized should have previously held ACA for the same system. The recommending ACA should be sufficiently familiar with the aircraft type being used as the basis for the authorization to be able to determine the applicability of the previous experience to the new aircraft type. The PRAA should be able to produce documentary evidence that supports the validity of the previous experience. Regardless of the method of compliance used, the provisions of 1.4.2C.3.d(1)(b).iii and 1.4.2C.3.d(1)(b).iv remain in effect. Usually, the AMO will be documenting this process within an implementation and training plan that is reviewed by the WSM and approved by the TAA. The purpose of this plan is to augment the organization's MPM, which contains the airworthiness "Steady State" policies, and to serve as documenting what the regulator has approved for the start of operations.*

iii. the supervising ACA shall provide a written statement regarding completion of the task, the date and the aircraft type or component part number as applicable; and

iv. the supervising ACA's statement means that the person has demonstrated that they are skilled to the level necessary to perform, verify, record and certify the task in accordance with Part 3, Chapter 1 including:

(i) identify the correct maintenance manual or standard for the performance of the task;

(ii) select the proper tools;

(iii) perform the task correctly;

(iv) verify the task as required;

(v) complete the necessary entries in the Technical Record; and

(vi) has detailed understanding of the responsibilities of maintenance release authority as specified in 3.1.2.S10.

(c) **Experience.** For ACA, a person shall:

i. be a Transport Canada Aircraft Maintenance Engineer (AME) license holder; or

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ii. have successfully completed a four-year apprenticeship program that has been approved by the TAA, and complies with the following:

(i) the program specifies the requisite skills, knowledge and experience requirements covering an appropriate range of tasks;

ADVISORY NOTE

An acceptable apprenticeship program would normally consist of four years of experience in all applicable areas of an AMO and include documentary evidence that at least 70 per cent of the tasks defined in the apprentice logbook, applicable to the trade sought, have been covered. The program should also include some form of examination to test the apprentice's knowledge of the trade and the applicable airworthiness rules and standards.

(ii) at least six months of the experience claimed shall be in an AMO or a maintenance organization acceptable to the TAA;

(iii) at least 12 months of the experience claimed shall be on aircraft types that have been issued type certificates by airworthiness authorities acceptable to the TAA;

(iv) experience can be gained either on a full-time or part-time basis;

(v) original records shall be used to substantiate the actual hours worked; and

(vi) in assessing experience claims, one year shall consist of 1 800 working hours and any one month shall consist of no more than 150 working hours.

(2) **ACA Responsibilities.** The person assigned ACA by the PRAA within an AMO is responsible for complying with the requirements of 3.1.2.S10.

(3) **SCA Eligibility Criteria.** The minimum acceptable levels of knowledge, skills and experience for a person to be assigned SCA are as follows:

ADVISORY NOTES

1. *In accordance with 1.4.2.S1.5.g, an AMO defines, in compliance with the following criteria, the SCA knowledge, skills and experience eligibility criteria necessary for the organization's scope and depth of assigned technical airworthiness authority on the particular aeronautical products involved. These defined eligibility criteria are detailed in the MPM in accordance with 1.4.2.S1.6.d. This may include specific courses or experience required to comply with the above minimum criteria, as applicable to the scope and depth of assigned SCA.*

2. *Upon joining an AMO, a technician who previously held SCA on the same aeronautical product, may be granted SCA after the PRAA is satisfied that the individual is ready to assume this authority in the new organization. However, care must be taken not to automatically grant an authorization based on previously held authority on the same aeronautical product. The PRAA must ensure factors such as training standards, experience, differences in scope and depth of authority, inexperience in the new AMO and knowledge of the organization's MPM and core procedures are accounted for prior to granting the authorization.*

3. *It is important to note that SCA is not a lesser category of MRA. It is, rather, the certification authority for work performed off-aircraft. A person who holds ACA may be authorized SCA once that person has been given the appropriate training for the task. The different eligibility criteria listed for SCA are to allow an AMO to employ a person, who does not meet the eligibility criteria for ACA, for specific duties in a shop environment only. Regardless of whether a technician holds ACA or not, work performed off-aircraft must be certified by an authorized SCA.*

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4. *When applicable, for each of the categories and corresponding sub-categories listed in 1.4.2C.2.a(4), the organization should define the eligibility criteria for an individual to perform and certify the applicable task and specify the standard to which the task must be performed, in their process manual.*

5. *The SCA should be categorized to reflect the methods (e.g., welding), systems (e.g., avionics) or work scope (e.g., sheet metal) an individual is approved to certify.*

6. *For some Third Line Maintenance environments, particularly those supporting older Avionic systems, it may not be possible for SCAs to acquire specific formal training. SCAs may be authorized based on knowledge, skills and experience received through tailored in-house training programs on the specific system or on 'like' systems. The selected criteria and training requirement should be described in the organization's MPM.*

(a) **Knowledge.** The following knowledge is required:

i. a diploma or certificate in an appropriate field for the work for which SCA is being assigned from a training organization that is acceptable to the TAA as specified in 1.4.2C.6;

ADVISORY NOTE

Depending on the complexity and criticality of the work for which SCA is being assigned, the PRAA may determine that the knowledge requirement in 1.4.2C.3.d(3)(a).i, can be satisfied through work experience as per 1.4.2C.3.d(3)(c).

ii. successful completion of the Basic Airworthiness Exam attaining a minimum score of 70 per cent; and

ADVISORY NOTES

1. *TAA Advisory 2015-01 describes an acceptable means of compliance for the basic airworthiness exam for SCA candidates.*

2. *The TAA has recognized the Canadian Forces Air Maintenance Policy Level 2 course, as equivalent to the Basic Airworthiness Exam.*

iii. demonstrate a detailed understanding of the MPM for the AMO, including associated procedures.

(b) **Skills.** The SCA must be skilled in the following:

i. provide documented proof of having completed a suitable selection of maintenance tasks for the scope of the authority assigned;

ADVISORY NOTE

One acceptable form of documented proof is an aircraft technician log book which provides a record of tasks completed and details of training and experience.

ii. each task shall be carried out at least once under the direct supervision of a person who has either SCA for the task, or comprehensive knowledge of the task, and is acceptable to the PRAA;

iii. the supervising SCA shall provide a written statement regarding completion of the task, the date and the aircraft type or component part number, as applicable; and

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iv. the supervising SCA's statement means that the person has demonstrated that they are skilled to the level necessary to perform, verify, record and certify the task in accordance with Part 3, Chapter 1, including:

(i) identify the correct maintenance manual or standard for the performance of the task;

(ii) select the proper tools;

(iii) perform the task correctly;

(iv) verify the task as required;

(v) complete the necessary entries in the Technical Record; and

(vi) has detailed understanding of the responsibilities of maintenance release authority, as specified in 3.1.2.S10.

(c) **Experience.** For SCA, a person shall have working experience in the field, under the direct supervision of a person who has either ACA or SCA, for a period of not less than:

i. 1 800 hours for engine or propeller overhauls;

ii. 1 800 hours for ejection seat build up and overhauls; or

iii. 300 hours for all other cases, including the repair of engine modules.

ADVISORY NOTES

1. *The applicability of a period that does not meet the 1 800 or 300-hour requirement must be submitted to the TAA for approval.*

2. *Technicians currently holding ACA for an aircraft where the scope of authorization for an on-aircraft ACA covers the off-aircraft SCA work, can be granted SCA provided the requirements of 1.4.2C.3.d(3)(b).iii and 1.4.2C.3.d(3)(b).iv are met, and the ACA record meets the requirements of 1.4.2C.3.d(3)(b).i.*

4. **Revoking of Authorizations.** An authorization for PRAA, ARA or MRA must be revoked in any of the following situations:

a. Upon termination of employment in the AMO from which the authorization was granted;

b. When the holder of the authorization has not, for at least six months within the preceding 24 months, on the aircraft type or system for which ACA or SCA was granted:

(1) performed aircraft maintenance;

(2) supervised the performance of aircraft maintenance;

(3) supervised in a management capacity the performance of aircraft maintenance;

ADVISORY NOTE

The term management capacity may include a person, such as a shop supervisor or an aircraft maintenance superintendent who has not performed maintenance tasks as part of his day-today activities.

(4) served as an aviation maintenance instructor or supervised another aviation maintenance instructor in an aircraft maintenance training course provided by a training organization acceptable to the TAA, as specified in 1.4.2C.6; or

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(5) performed life cycle materiel management.

c. When the PRAA or the SMM deems that the holder of the authorizations should no longer be authorized ARA or MRA.

5. A person whose PRAA, ARA or MRA has been revoked in accordance with 1.4.2C.4 may regain the authorization by meeting the requirements of 1.4.2C.3.b, 1.4.2C.3.c(1), 1.4.2C.3.d(1) or 1.4.2C.3.d(3), as applicable.

ADVISORY NOTE

The PRAA in an AMO may require additional proof of knowledge and skills prior to granting an ARA or a MRA to someone who has been away from aviation work for a period greater than 24 months.

6. **Acceptable Training Organization.** Training organizations acceptable to the TAA for the basic course referred to in 1.4.2C.3.d(1)(a).i, and the diploma or certificate referred to in 1.4.2C.3.d(3)(a).i, include:

a. a training organization in the Canadian Armed Forces, provided the course material meets the requirements of this annex, the appropriate Occupation Specification (OS) and/or the appropriate Occupation Speciality Specification (OSS) through the procedures identified in the Canadian Forces Individual Training and Education System (CFITES);

b. a Transport Canada (TC)-approved aviation maintenance training organization; and

c. a Federal Aviation Administration (FAA)-approved aviation maintenance training organization.

7. **Restricted Certification Authority (RCA).** When no one with ACA or SCA is available, a competent person may be authorized to sign a one-time maintenance release in respect of work performed on an aeronautical product. The RCA authorized may involve whatever limitations or restrictions are deemed necessary by the person responsible for the assignment of authority to assure the airworthiness of the aeronautical product involved. The RCA authorization expires as soon as it has been exercised.

ADVISORY NOTES

1. *An RCA is not intended to be granted on a routine basis to deal with the lack of qualified personnel within an AMO. Its use should be limited to unusual or extenuating situations when a person with the appropriate ACA or SCA is not immediately available. Examples include a deployment where the need for a specific maintenance release was unforeseen or the recovery of an unserviceable aircraft at another maintenance organization.*

2. *The granting of RCA can easily be abused if it is used in situations involving shortcomings in the training and/or qualification of personnel within the AMO and insufficient personnel resources. TAA airworthiness surveillance activities and Airworthiness Regulatory Comprehensive Audits, in accordance with Part 1, Chapter 6, of an AMO will include a review of the use of RCA and any indication of abuse could result in a limitation, restriction and/or reduction in the scope and depth of the airworthiness authority assigned to the AMO.*

3. *The SMM may decide that the granting of RCA needs to be tightly controlled within the AMO. One method of increasing control is to include both the SMM and the person responsible for the assignment of authority in authorizing assignment of RCA.*

a. **RCA Eligibility Criteria.** The minimum acceptable levels of knowledge, skills and/or experience for a person to be assigned RCA shall be determined by the PRAA within the AMO on a case-by-case basis, depending on the complexity of the work to be performed. RCA authorizations acceptable to the TAA include:

ADVISORY NOTE

It is not possible to produce an exhaustive list of situations where RCA may be appropriately assigned. Therefore, each situation should be evaluated carefully and a decision made based on

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sound judgement and an assessment of the airworthiness risk involved. The MPM should, however, provide the PRAA guidance as to what the organization considers acceptable use of RCA and the organization's minimum standards for qualification requirements.

(1) for the maintenance release relating to a maintenance task performed within a maintenance organization that is not accredited or recognized by the TAA in accordance with 1.4.2.R1, the person shall hold knowledge and/or experience that are determined by the PRAA within an AMO to be equivalent to those required for personnel assigned ACA or SCA within the AMO; and

ADVISORY NOTE

An example of this type would be maintenance performed within a Transport Canada (TC) AMO and certified by a TC licensed technician who is authorized in accordance with the TC-approved Maintenance Policy Manual for the AMO.

(2) for the maintenance release relating to a maintenance task performed by a foreign military organization, the person shall hold knowledge and/or experience that are determined by the PRAA within the AMO to be equivalent to those required by personnel assigned ACA or SCA within the AMO.

ADVISORY NOTE

An example of this would be maintenance performed by a USAF C130 technician on a CAF CC130.

b. **RCA Responsibilities.** Prior to assigning RCA to an individual, the PRAA has to make sure that the individual understands the responsibilities associated with a maintenance release as defined in 3.1.2.S10.

c. The RCA should only be authorized after the availability of all applicable maintenance manuals, tools and facilities to perform the maintenance task has been confirmed and the individual has been made aware that the RCA is being exercised on behalf of the TAA. The following authorization or similarly worded statement shall be made in the aircraft Technical Record and signed by the PRAA within the AMO:

"(name and identifying number, if applicable) **is hereby authorized to sign the** (specify the name and number of the form and the applicable block), **which constitutes a Maintenance Release on behalf of the Technical Airworthiness Authority, a delegated authority of the Minister of National Defence, for** (details of the maintenance task involved, including aircraft registration number)."

ADVISORY NOTE

The intent of the terms "similarly worded statement" is to provide flexibility for organizations who may prefer somewhat different wording and account for an error in wording that will not invalidate the release.

d. In order to exercise RCA, an AMO must have a procedure that ensures that all other processes within the MPM are adhered to when granting a RCA. The procedure for granting RCA shall establish appropriate organizational records that document each case where RCA was granted in sufficient detail to allow for future audit of compliance with the airworthiness rules and standards.

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APPENDIX 1, ANNEX C

SPECIALIZED MAINTENANCE

1. The modification, repair or replacement by riveting, bonding or laminating, or the making of any of the following airframe parts, constitutes specialized maintenance:

   a. a box beam;

   b. a wing stringer or chord member;

   c. a spar;

   d. a spar flange;

   e. a member of a truss-type beam;

   f. the web of a beam;

   g. a keel or chine member of a flying boat hull or a float;

   h. a corrugated sheet compression member in a wing or tail surface;

   i. a wing main rib or compression member;

   j. a wing or tail surface brace strut;

   k. an engine mount;

   l. a fuselage longeron or frame;

   m. a member of a side truss, horizontal truss, or bulkhead;

   n. a seat support brace or bracket;

   o. a landing gear strut or brace strut;

   p. an axle;

   q. a wheel; and

   r. a ski or ski pedestal, excluding the replacement of a low-friction coating.

2. The modification or repair of any of the following parts of an airframe constitutes specialized maintenance:

   a. aircraft skin that is not subject to pressurization loads, or the skin of an aircraft float, where the work requires the use of a support, jig or fixture;

   b. aircraft skin that is subject to pressurization loads, where the damage to the skin measures more than 15 cm (6 inches), in any direction;

   c. a load-bearing part of a control system, including a control column, pedal, shaft, quadrant, bellcrank, torque tube, control horn and forged or cast bracket, but excluding:

      (1) the swaging of a repair splice or cable fitting; and

      (2) the replacement of a push-pull tube end fitting that is attached by riveting.

   d. any other structure that a manufacturer has identified as a primary structure in its maintenance manual, structural repair manual or any instructions for continued airworthiness.

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3. Any task of the following types constitutes specialized maintenance:

a. reassembly of a multi-part engine crankshaft or a crankshaft equipped with a dynamic counterweight system;

b. reassembly of the crankcase of a reciprocating engine that is equipped with an integral supercharger or a propeller reduction gear;

c. overhaul of a reciprocating engine that is equipped with an integral or turbo supercharger; and

d. overhaul of a turbine engine or turbine engine module.

4. Any of the following types of repair to a propeller, where the work is beyond the limits recommended in the approved maintenance manual constitutes specialized maintenance:

a. re-contouring, twisting, shortening or straightening of a propeller blade or the blending of damage thereto;

b. repair or machining of a propeller hub, excluding the removal of surface corrosion or application of a protective coating;

c. reinstallation of a metal leading edge sheath or tip of a wooden blade;

d. replacement of the outer protective coating on a wooden blade, excluding the restoration of varnish;

e. repair of an elongated propeller attachment or propeller blade attachment bolt hole;

f. inlaying of a repair patch on a wooden blade;

g. repair of a composite blade; and

h. overhaul or repair involving the reassembly of a controllable pitch propeller, excluding the reattachment of a propeller blade to a hub that has been disassembled for shipping purposes.

5. The testing or repair of any of the following avionics components, where that testing or repair is beyond the limits recommended in the approved maintenance manual or the modification of an aircraft that results in the installation of any of the following components constitutes specialized maintenance:

a. a navigation system, communications system or flight guidance system, including their associated transmitters, receivers and instruments;

b. any component of an electrical generation system, or any component of an electrical power distribution system located between the generating source and its associated distribution bus; and

c. an autopilot system or component thereof.

6. Any of the following types of maintenance of an appliance or component, where the work is beyond the limits recommended in the approved maintenance program constitutes specialized maintenance:

a. reassembling of valves that are activated electrically or through the use of controlled fluid pressure;

b. calibrating or flow checking of any fuel metering or air metering component, other than a float-type carburetor;

c. overhaul of any pressure-type fuel, oil, pneumatic or hydraulic pump;

d. repair involving the disassembly of speed-regulating devices, including an engine or propeller governor or a constant-speed drive;

e. overhaul of a rotor head, transmission or any mechanism used to transmit power to a tilt-wing aircraft or helicopter;

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f. repair of a helicopter rotor blade;

g. rewinding of the field coil or armature of an electrical accessory;

h. overhaul of an aircraft magneto; and

i. patch repair to a bladder-type fuel tank.

7. Any of the following welding processes constitutes specialized maintenance:

a. welding of any part of the airframe, including a wheel, an axle or any part of a passenger restraint system or a cargo restraint system;

b. welding any part of an aircraft system, including a fuel tank, an oil tank and a pneumatic or hydraulic reservoir, or

c. welding of any structural or dynamic engine part.

8. **Acceptable Standards for Welders.** In order for a maintenance organization to perform welding tasks, they must employ individuals that are qualified to either:

a. AWS D17.1 – Specifications for Fusion Welding for Aerospace Applications; or

b. ISO 24394:2008 – Welding for Aerospace Applications – Qualification test for welders and welding operators – Fusion welding of metallic components.

ADVISORY NOTE

The TAA recognizes the Canadian Forces Specifications D-49-001-024/SF-001 – Fusion Welders (Aircraft and Missile Application) to qualify welders employed in DND military maintenance organizations.

9. Any inspection of an aeronautical product that is required by an airworthiness directive or the maintenance schedule, which involves the use of different Non-Destructive Techniques, including, but not limited to, liquid penetrant, magnetic particle, radiographic, ultrasonic, thermographic or eddy current methods constitutes specialized maintenance:

10. **Acceptable Standards for Non-Destructive Testing (NDT) Organizations.** In order for Maintenance Organizations to perform and certify NDT tasks, they must employ individuals who either:

a. hold a Level 2 or Level 3 NDT certification from the Canadian General Standards Board (CGSB); or

b. meet the requirements stipulated in the latest NDT Trade Standard of NAS 410 or ATA Specification 105.

ADVISORY NOTES

1. *These standards establish the minimum requirements for the qualification and certification of personnel performing NDT activities. The maintenance organization adopting one of these NDT Trade Standards will need to include the required policies within their Airworthiness Process Manual (APM) supported with applicable procedures within the organization's Quality Management System (QMS).*

2. *An AMO would be able to enter into support arrangements with an organization that employs individuals who meet the standard stipulated in sub-paragraph 1.4.2C.10.a or 1.4.2C.10.b.*

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11. **Acceptable Standards for Non-Destructive Testing (NDT) Operators.** An AMO that does not have a NDT organizational approval may assign NDT tasks to individuals from within their organizations, referred to as NDT Operators, provided that:

a. the NDT Operator's task is limited to:

(1) one of the following NDT methods:

(a) magnetic particle;

(b) liquid penetrant;

(c) ultrasonic; or

(d) eddy current; and

(2) a specified component, and the inspection criteria meet the following requirements:

(a) has predictable discontinuities; and

(b) has clear, objective acceptance criteria.

b. the methods and techniques adopted by NDT Operators have been approved by the fleet TCH;

c. the organization's APM clearly defines the scope and depth of each authorized NDT method for the NDT Operators;

ADVISORY NOTES

1. *The TCH organization is responsible for the airworthiness approval of NDT procedures that can be performed by NDT Operators. Within the DND/CAF, this approval is normally based on a recommendation from the Aerospace and Telecommunications Engineering Support Squadron (ATESS) and guidance from TAA NDT specialists (DTAES 7 staff). Civilian organizations may use CGSB Level 3 technicians to develop NDT Operator procedures. However, the TCH remains responsible for incorporation of the procedure within the maintenance program.*

2. *The TCH may allow an organization within their design support network to approve NDT tasks that could be performed by NDT operators without the TCH's involvement. When the TCH chooses this option, the organization needs to document the necessary airworthiness requirements within their TAA-approved Airworthiness Process Manual.*

d. the individual designated as NDT operator shall meet the following eligibility criteria:

(1) must be an Aircraft Certification Authority (ACA) for on-aircraft NDT tasks; and

(2) must be an ACA or Shop Certification Authority (SCA) for NDT tasks performed on off-aircraft components.

e. the following requirements must be met for the initial training qualification and authorizations:

(1) training shall be provided by:

(a) an acceptable organization, as per 1.4.2C.6, teaching to the standards stipulated at sub-paragraphs 1.4.2C.10.a and/or 1.4.2C.10.b; or

(b) an individual within an AMO holding appropriate NDT ratings, but not one of NDT Operator;

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(2) the formal training shall not be less than:

(a) 50% of the number of hours required of a CGSB Level 1 in the specified method for the trade standard stipulated in paragraph 1.4.2C.10.a; or

(b) 25% of the number of hours required of a CGSB Level 1 in the specific method for the trade standard stipulated in paragraph 1.4.2C.10.b;

(3) the initial training shall be supplemented by practical On-the-Job Training (OJT). The OJT experience shall not be less than:

(a) one month, or 50% of the time required of a CGSB Level 1 in the specific method for the trade standard stipulated in paragraph 1.4.2C.10.a; or

(b) 10% of the number of hours required of a CGSB Level 1 in the specific method for the trade standard stipulated in paragraph 1.4.2C.10.b;

(4) the initial qualification shall be awarded by an evaluator with a valid certification in the method for which the NDT Operator is being assessed, who is either:

(a) a certified CGSB Level 2 or higher within the NDT standard stipulated in paragraph 1.4.2C.10.a; or

(b) a certified CGSB Level 3 within the NDT standard stipulated in paragraph 1.4.2C.10.b.

ADVISORY NOTES

1. The evaluator can only grant an individual a NDT Operator qualification. It is the responsibility of the maintenance organization to certify that individual in accordance with the authorization policies contained in the APM.

2. The TAA will recognize TCCA-acceptable maintenance organizations that currently employ NDT Operators that are trained and qualified in accordance with Part V Standard 571 Appendix K of the CARs.

(5) re-certification training shall be performed annually by an individual who is either:

(a) a certified CGSB Level 2 or Level 3 for the NDT standard stipulated in paragraph 1.4.2C.10.a; or

(b) a certified CGSB Level 3 for the NDT standard stipulated in paragraph 1.4.2C.10.b.

(6) the individual meets the vision requirements specified in the latest version of CAN//CGSB 48.9712.

12. **NDT Records.** The organization shall maintain a log of its personnel's training, qualifications, authorizations and annual vision testing records. These records must be retained in accordance with 5.5.2.R3.

ADVISORY NOTE

TAA Advisory 2016-03 provides further information and guidance on NDT training, qualification and APM requirements, tailored to specific NDT standards that an organization may select.

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ANNEX D

ACCEPTABLE MATERIEL SUPPORT ORGANIZATION (AMSO)

1. **Eligibility Criteria.** To be deemed acceptable by the TAA as an AMSO, an organization must meet the requirements stipulated in Section 2 of this chapter (1.4.2).

2. **Materiel Support Process Manual (1.4.2.S1.3).** To be deemed acceptable by the TAA, an organization must have an Airworthiness Process Manual (APM) that meets the requirements of 1.4.2. The APM within an AMSO is referred to as a Materiel Support Process Manual (MSPM). In addition to the requirements stipulated in 1.4.2, the following standards apply:

ADVISORY NOTES

1. *Following the title of each sub paragraph below, the specific section of 1.4.2 is indicated in parentheses.*
2. *Refer to TAA Advisory 2013-02, for additional guidance on the development of an Airworthiness Process Manual and a sample Table of Contents.*

a. **AMSO Description (see 1.4.2.S1.6.c).** The MSPM shall provide a description of the AMSO, including the following:

(1) the facilities used by the AMSO for the warehousing and distribution of the aeronautical products; and

(2) all locations where aeronautical products will be stored.

b. **Scope and depth of authority. (1.4.2.S1.6.c(3)).** The scope and depth of technical airworthiness authority shall be described by listing the specific technical airworthiness activities that will be performed during the control and handling of aviation replacement parts.

ADVISORY NOTE

The technical airworthiness activities performed in an AMSO may include procurement, receipt, packaging, handling, storage, issuing and disposal, including documentation control for the life cycle of aviation replacement parts. While there are no technical airworthiness functions conducted in an AMSO, there are materiel support activities that may impact the airworthiness of the aeronautical product, if conducted by individuals not holding the requisite knowledge, skills and experience commensurate with the task being performed. Accordingly, formal training and assignment of authority is required for those airworthiness activities identified. This will be amplified in the organization's MSPM and enabling processes. The TAA can provide assistance in the preparation and format of the organization's assignment of authority.

c. **Parts Supplier Requirements (1.4.2.S1.6.c(4)).** The MSPM should include a process for entering into parts supplier arrangement and providing technical airworthiness oversight to organizations contracted to supply aviation replacement parts, in accordance with 5.2.2.R1. This shall include processes for:

(1) evaluating and monitoring the effectiveness of the parts supplier's quality system. This may be accomplished by reviewing the organization's quality processes and conducting on-site audits to verify compliance with the selected quality standards and established audit frequency. This would also include an examination of the company's quality records used for documenting internal audits and addressing corrective actions and conducting staff interviews as required;

(2) defining the documentation requirements for the supplier including the documentation required for parts being shipped to the AMSO; and

(3) a procedure (as required) for direct shipping arrangements and authorities.

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ADVISORY NOTE

In some cases, the AMSO may wish to allow parts suppliers to ship replacement parts directly to the end user, by-passing the AMSO's receiving inspection line. While the parts supplier must receive written authorization to ship directly to the user/operator, there is no requirement for written authorization for each direct shipment. The authorization may include limitations such as specific part numbers, time periods and particular users/operators for which direct shipment is authorized.

d. **Relationship with the TCH.** The MSPM should include a description of interactions required with the Acceptable Technical Organization (ATO) that exercises TCH responsibilities.

e. **Personnel Authorization Control (1.4.2.S1.6.e).** The MSPM shall provide a description of the system used to train and assess individuals who are assigned authority within the AMSO to perform materiel support tasks. The MSPM must contain:

(1) the eligibility criteria defined by the AMSO in accordance with 1.4.2.S1.5.g, for conducting the materiel control activities described in the organization's Airworthiness Control System;

(2) the process used to ensure personnel satisfy the defined eligibility criteria prior to authorization;

(3) the process used to control authorizations; and

(4) the process used to ensure that authorized personnel understand their individual responsibilities described in paragraph 4 of this annex.

ADVISORY NOTE

The authorization system used within the AMSO must provide for records that document the authorization process. This will require processes and procedures that standardize the method used to capture experience, validate training, recommend authorizations, grant authorizations and review assigned authorities. The records generated are subject to the provisions of Part 5, Chapter 5.

f. **Airworthiness Control System (1.4.2.S1.6.g).** The MSPM shall describe the processes identified in accordance with 1.4.2.S1.5.k. Where applicable, the airworthiness control system for an AMSO shall include processes that manage:

(1) procurement of Replacement Parts, in accordance with 5.2.2.R1;

(2) receiving inspections to ensure that procured replacement parts and documentation meet the requirements of 5.2.2.S2.2;

(3) handling and control of unapproved parts that meet the requirements of 5.2.2.S2.3 and 3.4.2.S1.1.g;

(4) a documentation control system that ensures that technical data (e.g. Certificates of Conformance) are current and accessible, in accordance with 5.2.2.S2.4. This must include (where applicable) an inspection stamp/tag or document duplication system that ensures control of issuance, accountability for incoming inspections and traceability to the original documentation, in accordance with 5.2.2.S2.5;

(5) packaging control that ensures parts shipped and stored are adequately protected from damage and/or deterioration, in accordance with 5.2.2.S2.6, 5.2.2.S2.7 and 5.2.2.S2.8;

(6) a system for hazardous material control and handling that meets federal, provincial and local regulations;

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(7) a shelf-life control system that assures that the quality and technical criteria are for each part stocked, that is, identified as having a shelf life, in accordance with 5.2.2.S2.9. This must include lot and batch control;

(8) disposal of Replacement Parts, in accordance with Part 4, Chapter 1;

(9) assignment of technical airworthiness authority for airworthiness-related activities conducted in the AMSO; and

(10) any other process(es) required for the organization to carry out its airworthiness-related activities in compliance with the TAM.

3. **Individual Technical Airworthiness Authority (1.4.2.S2).** To be deemed acceptable as an AMSO, an organization must, in accordance with 1.4.2.S1.5.f., define the eligibility criteria for personnel to perform airworthiness management roles and technical airworthiness materiel support activities on behalf of the TAA. The following paragraphs specify the minimum eligibility criteria for this personnel and the typical responsibilities associated with the designated roles.

a. **Senior Materiel Support Manager (SMSM).** The SMSM is identified by the organization to be responsible for the airworthiness-related activities conducted within the AMSO. To perform this airworthiness management role, the SMSM requires the assignment of technical airworthiness authority by the TAA. As a designated representative of the TAA, the SMSM shall ensure that the airworthiness-related activities of the AMSO are performed in compliance with airworthiness rules and standards. The SMSM may also perform technical airworthiness activities on behalf of the TAA.

ADVISORY NOTE

The SMSM role is not attached to any particular position within a CAF organization or company, but rather must be performed by a suitable individual, considering the scope and depth of technical airworthiness authority of the AMSO.

(1) **SMSM Eligibility Criteria.** To be eligible for the assignment of technical airworthiness authority by the TAA, a SMSM must meet the minimum knowledge, skills and experience criteria as listed below:

(a) **Knowledge.** The following knowledge is required:

i. Be a graduate of an applicable materiel management or aerospace technology course acceptable to the TAA or, in the opinion of the TAA, have equivalent knowledge and experience.

ii. Have detailed knowledge, gained by formal training and/or work experience, of the technical airworthiness rules and standards, and, where required, an understanding of the applicable operational requirements and environment:

(i) through successful completion of the DND Technical Airworthiness Online Familiarization Course or having equivalent, relevant experience;

(ii) pertaining to the TAM chapters on procurement and control of aviation replacement parts and disposal of aviation parts.

iii. In the opinion of the TAA, have detailed knowledge, gained by formal training and/or work experience, of the accredited aviation replacements part suppliers and distributors.

iv. Demonstrate a detailed understanding of the following topics to the satisfaction of the TAA:

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NOTE

These topics may also be covered as part of the formal interview process.

(i) the scope and depth of technical airworthiness authority assigned by the TAA to the AMSO;

(ii) the airworthiness responsibilities of the AMSO for work performed by the AMSO and external agencies through materiel supplier arrangements;

(iii) the responsibilities of the role of SMSM;

(iv) the responsibilities of the personnel responsible for materiel support activities;

(v) the MSPM for the AMSO, which includes a description of the airworthiness control system and associated procedures;

(vi) the interrelationship and interfaces between Technical Airworthiness Program and Quality Management System requirements.

(b) **Skills**. As applicable for the scope and depth of technical airworthiness authority of the organization, skilled in the following and able to demonstrate or provide current and/or past examples regarding the ability to:

i. Correctly interpret airworthiness standards;

ii. Correctly apply airworthiness processes;

iii. Develop processes for inclusion in the MSPM that are in compliance with the applicable airworthiness rules and standards;

iv. Evaluate AMSO procedures for compliance with the TAA-approved MSPM.

v. Apply management principles to:

(i) ensure that airworthiness-related activities are conducted in accordance with the TAA-approved MSPM and the AMSO-approved procedures;

(ii) ensure that the authorization of personnel performing airworthiness-related tasks and technical airworthiness functions is accomplished in accordance with the TAA-approved MSPM and the AMSO-approved procedures;

(iii) monitor the competencies of individuals to whom technical airworthiness authority has been assigned and of the organization as a whole;

(iv) monitor individuals responsible for performing materiel support activities;

(v) evaluate the capabilities of personnel for the assignment of technical airworthiness authority;

(vi) ensure adequate competence is applied in the materiel support-related decisions that may affect the airworthiness of an aeronautical product;

(vii) ensure that appropriate action is taken to correct any practice or procedure which may compromise the airworthiness of an aeronautical product and/or that the matter is brought to the attention of the TAA;

vi. Communicate with external agencies to:

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(i) ensure that contracts or service level agreements are developed and maintained as necessary to enable the AMSO to provide the scope and depth of materiel support management required;

(ii) ensure that work performed by parts suppliers is conducted in accordance with AMSO-approved procedures and the contracted organization's respective procedures.

(c) **Experience.** The SMSM shall have no less than three (3) years of relevant and progressively more responsible materiel support experience, of which one (1) year is in the management of aviation replacement parts.

(2) **SMSM's Responsibilities.** A SMSM within an AMSO has the following responsibilities within the limitations and restrictions of the technical airworthiness authority assigned by the TAA:

(a) interpreting airworthiness standards and processes;

(b) ensuring that the MSPM for the organization is in compliance with the applicable airworthiness rules and standards;

(c) ensuring that the procedures of the AMSO are in compliance with the TAA-approved MSPM and are documented in a publication approved within the organization;

(d) ensuring that airworthiness-related activities are conducted in accordance with the TAA-approved MSPM and the AMSO-approved procedures;

(e) advising the TAA of any changes within the AMSO or parts supplier chain that will impact the scope and depth of airworthiness authority assigned to the AMSO;

(f) ensuring that the authorization of personnel performing airworthiness-related tasks is accomplished in accordance with the TAA-approved MSPM and the AMSO-approved procedures;

(g) taking action to correct any practice or procedure that may compromise the airworthiness of an aeronautical product, or drawing the matter to the attention of the TCH, and advising the applicable organizational authorities of actions taken, if the situation is beyond the control of the individual;

(h) notifying the TAA of any procedural difficulties or deficiencies that result from airworthiness rules and standards or TAA-approved processes, making recommendations for rectification and/or improvement and advising the applicable organizational authorities of actions taken;

(i) keeping the TCH informed of any significant issues or developments that may adversely affect the airworthiness of an approved type design for an aeronautical product and advising the applicable organizational authorities of actions taken;

(j) monitoring the competencies of individuals to whom technical airworthiness authority has been assigned and of the organization as a whole, and informing the TAA of any deficiencies, advising the applicable organizational authorities of actions taken;

(k) revoking technical airworthiness authority from individuals within the organization when it is deemed appropriate to do so;

(l) ensuring that personnel within the organization receives the necessary training and remain knowledgeable and skilled in the conduct of airworthiness-related tasks;

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(m) ensuring that contracts or service level agreements with external agencies are developed and maintained as necessary to enable the AMSO to provide the scope and depth of materiel support required;

(n) ensuring that the AMSO is subject to adequate quality oversight for its entire airworthiness scope and depth of authority granted by the TAA;

(o) monitoring the adequacy of the corrective action plan raised to document non-compliances with the TAA-approved or recognized MSPM and core procedures;

(p) ensuring work performed by external agencies that are not accredited or recognized by the TAA, in accordance with 1.4.2.R1 is conducted in accordance with the AMSO-approved procedures. The AMSO is responsible for the tasks to be performed, for the quality of work and for meeting the airworthiness requirements of the technical airworthiness activities performed; and

(q) for periods of absence, appoint a competent individual within the organization to carry out the SMSM duties and responsibilities with whatever limitations and restrictions are deemed necessary and appropriate.

4. **Materiel Support Activity Responsibilities.** Individuals authorized by the SMSM to perform materiel support activities must have knowledge of the MSPM and its core procedures relating to their assigned functional areas, as defined below:

ADVISORY NOTE

For the purpose of this annex, materiel support related activities have been separated into five (5) functional areas: Procurement, Shipping and Receiving, Parts Control, Documentation Control and Disposal.

a. **Procurement.**

(1) Ensuring that replacement parts for use on an aeronautical product are procured from sources acceptable to the TAA, in accordance with 5.2.2.R1;

(2) Ensuring any issues or problems discovered during the procurement of replacement parts are referred to the SMSM;

(3) Liaising with the TCH as required to address issues related to part procurement.

(4) Provide technical airworthiness oversight to parts suppliers by periodically monitoring the effectiveness of their quality system and conducting on-site audits to ensure compliance with the requirements of their respective quality system standards and all the requirements of this annex; and

(5) Provide authority and oversight for direct shipping arrangements (as required).

b. **Shipping and Receiving.**

(1) Ensuring that receiving inspection of aviation replacement parts is conducted in accordance with the approved procedure for the AMSO and meets the requirements of 5.2.2.S2.2;

(2) Ensuring that replacement parts are packaged in accordance with 5.2.2.S2.6; and

(3) Ensuring transportation of replacement parts is conducted in accordance with the requirements of 5.2.2.S2.10;

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c. **Parts Control.**

(1) Ensuring that replacement part handling and storage is performed in accordance with the requirements of 5.2.2.S2.7 and 5.2.2.S2.8;

(2) Ensuring that shelf-life-limited replacement parts and lot and batch parts are controlled, in accordance with the requirements of 5.2.2.S2.9; and

(3) Ensuring that, upon discovery of unapproved parts during incoming inspection, the affected parts are quarantined in accordance with an approved procedure for the AMSO, pending resolution, in accordance with 5.2.2.S2.3.

d. **Documentation Control.**

(1) Ensuring that documentation is controlled in accordance with an approved procedure for the organization, which will satisfy the requirements for traceability back to the proof of conformance for the replacement part, in accordance with 5.2.2.S2.4. Acceptable documentation to provide proof of conformance is defined at 5.2.2.S1.2.

ADVISORY NOTE

The organization may utilize a locally produced inspection tag or stamp to certify that the conformance documentation has been reviewed and found acceptable. In this manner, conformance documentation can be retained and filed separately following an approved process for the organization. Alternatively, the conformance documentation may be retained with the replacement part for issuing to the Acceptable Maintenance Organization (AMO).

e. **Disposal.**

(1) Ensuring that time-expired parts and non-conforming parts are disposed, in accordance with an approved procedure for the AMSO and meet the requirements of Part 4, Chapter 1.

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ANNEX E

ACCEPTABLE DESIGN ORGANIZATION (ADO)

1. **Eligibility Criteria.** To be deemed acceptable by the Technical Airworthiness Authority (TAA) as an ADO, an organization must meet the requirements stipulated in Section 2 of this chapter (1.4.2).

2. **Engineering Process Manual (EPM).** To be deemed acceptable by the TAA, an organization must have an Airworthiness Process Manual (APM) that meets the requirements of 1.4.2. The APM in an ADO is an EPM. In addition to the requirements stipulated 1.4.2, the following standards apply:

ADVISORY NOTE

Further guidance on the development of an APM can be found in TAA Advisory 2013-02.

a. **ADO Description.** The scope of activities performed within the ADO must be clearly defined and include all applicable airworthiness-related activities.

b. **Scope and depth of authority.** The scope and depth of technical airworthiness authority shall be described by listing the specific technical airworthiness functions that will be performed by engineering specialty area.

ADVISORY NOTES

1. *The technical airworthiness functions performed in an ADO may include findings of compliance, airworthiness approval, TAC and granting flight authority. Normally, granting flight authority and TAC is performed within an ATO, but some ADOs may have limited authority for TAC and flight permits. The ADO will normally be required to identify their scope and depth of authority based on specialty areas for which a finding of compliance can be granted. This will be amplified by additional information related to specific aircraft type and the Certification Basis. Given the fact that scope and depth of authority is negotiated between the TAA and ADO based on personnel competency in the specialty areas, the TAA will provide assistance in the preparation and format of the organization's assignment of authority.*

2. *The following engineering specialty areas are often used by ADO to define the scope and depth of authority while performing finding of compliance: structural (metallic and/or non-metallic including composite); powerplant; materiel and processes; system and equipment (mechanical or electrical); avionics; and software.*

c. **Support arrangements.** The EPM shall include the process for entering into support arrangement with organizations that provide design support services to the ADO and describe the processes used to provide technical airworthiness oversight of any organizations within their Design Support Network (DSN).

d. **Relationship with the TCH.** The EPM should include a description of interactions required with the ATO that exercises TCH responsibilities.

e. **Personnel Authorization Control.** The EPM shall provide a description of the authorization control system, including the process used to train and assess individuals who are assigned authority within the ADO, for the associated engineering specialty, to:

(1) perform specific airworthiness management responsibilities of the SDE,

(2) perform technical airworthiness functions as a DE;

(3) perform airworthiness-related tasks in the design and engineering support of aeronautical products,

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(4) make findings of compliance in specific areas by persons who are not a DE but who possess the required training and qualifications to make such specific findings, when managed within a Certification Management Program as described in an approved Certification Plan.

ADVISORY NOTES

1. *The authorization system used must define the eligibility criteria for authorizations using authorization standards identified for Individual Technical Airworthiness Authority (paragraph 3 of this annex). In addition, the authorization system must identify any additional specialist engineering skill, knowledge and experience required to support the assignment of authority. For an ADO, the scope and depth of authority assigned to the organization is directly linked to the specialist engineering staff employed and authorized. For this reason the method used to document the organizations scope and depth of authority will be very similar to the method used to document authority assigned to individuals within the ADO. The TAA will validate specialist engineer eligibility criteria against the organizations requested scope and depth of authority during the accreditation or recognition process.*

2. *The EPM shall describe the selection and mentoring process for Candidate DEs who lack only the requisite experience in order to become an authorized DE. These Candidate DEs should be tasked to prepare engineering reports and assessments, provide engineering reviews of other data and make engineering recommendations as part of their DE development. When possible, each Candidate DE should be assigned to a DE mentor (usually a Primary DE for that specialist discipline within the ADO) who will be responsible to the SDE (and subsequently to the Airworthiness Control Committee (ACC)) for the candidate DE progress. It is also important for the Candidate DEs to keep track of the projects that they worked on and their specific contributions (i.e., prepare, review and recommend). These records will greatly contribute in substantiating the individual's experience in support of the scope and depth being proposed to the SDE.*

3. *The authorization system used within the ADO must provide for records that document the authorization process. This will require processes and procedures that standardize the method used to capture experience, validate training, recommend authorizations, grant authorizations and review assigned authorities. The records generated are subject to the provisions of Part 5, Chapter 5.*

4. *The development of aircraft design changes and repairs involve engineering processes that include activities that are in addition to airworthiness certification. As a result the authorization system must capture all engineering authorizations. This will include authorizations such as preparing data, reviewing reports, approving drawings, and preparing a hazard assessment.*

f. **Airworthiness Control System.** The EPM shall describe the airworthiness control system for the ADO and shall include processes that manage:

(1) Design changes, in accordance with the requirements of Part 3, Chapter 2;

(2) The issuing of special design and/or technical instructions, such as Service Bulletins for designs supported by the ADO;

(3) Compliance to Airworthiness Directives, in accordance with Part 5, Chapter 6;

(4) In-service Airworthiness Monitoring, in accordance with Part 3, Chapter 4;

(5) Configuration Management, in accordance with Part 3, Chapter 3;

(6) Identification of Aeronautical Products, in accordance with Part 5, Chapter 8;

(7) Type design examination activities, in accordance with Part 2, Chapter 5;

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(8) Technical Airworthiness Clearance activities, in accordance with Part 2, Chapter 3;

(9) The relationship between the ADO, TCH and TAA for airworthiness activities that are outside of the ADO's scope and depth of authority; and

(10) Any other process(es) required for the organization to carry out its airworthiness-related activities in compliance with the TAM.

g. **Airworthiness Control Committee (ACC).** The EPM shall describe the processes used to manage an ACC that meets the following requirements:

(1) Is chaired by the SDE and composed of members from the appropriate engineering or technical disciplines;

(2) Ensures the TAA is provided with a minimum of eight (8) weeks' notice for all ACC meetings where DE candidate evaluations will take place to allow for TAA staff attendance at the ACC;

ADVISORY NOTE

The TAA shall be provided with an opportunity to review the qualification files of candidates under consideration by the ACC prior to the ACC meeting. The TAA will determine if TAA staff should/will attend the ACC meeting and whether the TAA has any comments on the candidate files.

(3) Evaluates DE candidate qualifications, development of their training and monitoring training progress;

(4) Evaluates proposed changes to the ADO's EPM;

(5) Reviews internal and external audit findings and the resolution of identified deficiencies;

(6) Reviews, coordinates and ensures the completion of on-going engineering projects;

(7) Monitors all design change activities performed within the ADO;

(8) Reviews and ensures resolution of all safety concerns related to ADO developed designs; and

(9) Ensures that meeting minutes and decision records are available and maintained.

ADVISORY NOTE

For small ADOs with a limited scope and depth of authority, the use of an ACC may not be practical. The organizations' airworthiness control may be satisfied through SDE oversight. Prior to writing the EPM, the ADO, in consultation with the TAA staff, will determine whether a formal ACC is required.

h. **Findings of Compliance.** The EPM shall provide a clear description of individual responsibilities associated with making a finding of compliance certification that ensures the requirements of 3.2.2.S4 are met, including:

(1) All required data supporting the finding have been reviewed (appropriate standards were selected, appropriate means and methods of compliance were used and adequate proof of compliance was provided);

(2) Where a finding involves multiple specialist areas, a final signature is provided, making it clear that all areas were addressed and the findings were made by qualified individuals; and

(3) All findings are within the scope and depth of authority of the ADO.

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i. **Airworthiness Approval.** The EPM shall provide a clear description of individual responsibilities associated with certifying airworthiness approval that ensures the requirements of 3.2.2.S6, are met including:

(1) All required findings supporting the airworthiness approval have been reviewed (Certification Basis and means and methods of compliance are appropriate, adequate proof is provided and authorized individuals made each finding);

(2) Multiple Findings of Compliance are each duly signed off and an overall compliance signature is provided by authorized individuals; and

(3) Appropriate levels of independence between individuals making Findings of Compliance and the engineering staff performing the design development and engineering approvals.

ADVISORY NOTES

1. *The Airworthiness design certification process is part of the overall design development. It is important for an organization performing design development to have independent engineering review and approvals of data used to support the design change process. The Airworthiness design certification activities are normally performed independently from the engineering design process. An ADO's EPM will describe how design engineering activities are performed and how an appropriate level of independence is maintained within and between their engineering and airworthiness certification processes.*

2. *An ADO needs to ensure that design and repair activities that do not require an airworthiness design certification still receive an appropriate engineering approval. Care must be taken to ensure that aircraft repair designs that don't meet an airworthiness classification of 'major' are prepared and approved by engineering staff who have the required skills and experience.*

3. **Individual Technical Airworthiness Authority.**

a. **Senior Design Engineer (SDE).** The SDE is identified by the CAF unit or company to be responsible for the airworthiness-related activities conducted within the ADO. To perform this airworthiness management role, the SDE requires the assignment of technical airworthiness authority by the TAA. As a designated representative of the TAA, the SDE shall ensure that the airworthiness-related activities of the ADO are performed in compliance with airworthiness rules and standards. The SDE may also perform technical airworthiness functions on behalf of the TAA.

(1) **SDE Eligibility Criteria.** To be eligible for the assignment of technical airworthiness authority by the TAA, an SDE must meet the minimum knowledge, skills and experience criteria listed below:

(a) **Knowledge.** The following knowledge is required:

i. Be a graduate of an applicable engineering discipline from a university recognized by the TAA, or, in the opinion of the TAA, have equivalent knowledge gained through other forms of education and training.

ii. In the opinion of the TAA, have detailed knowledge of the organization's Airworthiness Process Manual and applicable core procedures and/or work instructions.

iii. Have detailed knowledge, gained by formal training and/or work experience of the DND technical airworthiness rules and standards, through successful completion of a TAA-recognized Aircraft Certification Course.

iv. In the opinion of the TAA, have detailed knowledge, gained by formal training and/or work experience, of the specific aeronautical products involved.

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v. Have a detailed understanding of the Statement of Operating Intent (SOI) document or applicable operational requirements and environment of the specific aeronautical products involved.

vi. Where an ADO's primary role is the engineering flight test, be a graduate from a recognized flight test school or, in the opinion of the TAA, have an equivalent qualification gained through engineering flight test experience.

vii. Demonstrate a basic understanding of the DND Airworthiness Review Board (ARB) process.

viii. Demonstrate a detailed understanding of the following topics to the satisfaction of the TAA:

NOTE

These topics may also be covered as part of the formal interview process.

(i) the scope and depth of technical airworthiness authority assigned by the TAA to the ADO and to other organizations involved with the design and engineering support of the approved type designs involved.

(ii) the airworthiness responsibilities of the ADO for work that is accomplished by both the organization and external agencies through support arrangements.

(iii) the responsibilities of the airworthiness management role of SDE.

(iv) the responsibilities of the persons in the ADO who have been assigned authority to perform technical airworthiness functions on behalf of the TAA.

(v) the EPM for the ADO including associated procedures.

(vi) the inter-relationship and interfaces between Technical Airworthiness Program and Quality System requirements.

(b) **Skills.** As applicable for the scope and depth of technical airworthiness authority of the organization, skilled in the following and able to demonstrate or provide current and/or past examples regarding the ability to:

i. Correctly interpret airworthiness standards.

ii. Correctly apply airworthiness processes.

iii. Develop processes for inclusion in the EPM that are in compliance with the applicable airworthiness rules and standards.

iv. Evaluate ADO procedures for compliance with the TAA-approved EPM.

v. Analyze specifications prepared for the development, test and/or technical support of an approved type design for an aeronautical product to ensure compliance with the applicable airworthiness rules and standards.

vi. Assess the category assigned during the development of a design change to an approved type design for an aeronautical product.

vii. Prepare certification plans.

viii. Prepare, review or approve Compliance Programs.

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ix. Provide guidance on the use of independent airworthiness reviews to personnel within the organization.

x. Apply management principles to:

(i) ensure that airworthiness-related activities are conducted in accordance with the TAA-approved EPM and the ADO-approved procedures.

(ii) ensure that the authorization of personnel performing airworthiness-related tasks and technical airworthiness functions is accomplished in accordance with the TAA-approved EPM and the ADO-approved procedures.

(iii) monitor the competencies of individuals to whom technical airworthiness authority has been assigned and of the organization as a whole.

(iv) monitor the development and progress of DE candidates

(v) evaluate the capabilities of personnel for the assignment of technical airworthiness authority.

(vi) ensure adequate engineering competence is applied in the engineering decisions that may affect the airworthiness of an approved type design for an aeronautical product.

(vii) ensure that appropriate action is taken to correct any practice or procedure which may compromise the airworthiness of an aeronautical product and/or that the matter is brought to the attention of the TAA.

xi. Communicate with external agencies to:

(i) ensure that contracts or service level agreements are developed and maintained as necessary to enable the ADO to provide the scope and depth of design and engineering support required.

(ii) ensure that the relationship with the TCH provides a clear understanding of the ADO- and TCH-relative responsibilities and roles in the conduct of engineering support.

(iii) ensure work performed by external agencies that are not TAA-accredited is conducted in accordance with ADO-approved procedures.

(c) **Experience.** The SDE must have no less than ten (10) years of relevant aerospace engineering or flight test experience and with progressively more responsibilities.

(2) **SDE's responsibilities.** A SDE within an ADO has the following responsibilities within the limitations and restrictions of the technical airworthiness authority assigned by the TAA:

(a) interpreting airworthiness standards and processes;

(b) ensuring that the EPM for the organization is in compliance with the applicable airworthiness rules and standards;

(c) ensuring that the procedures of the ADO are in compliance with the TAA-approved EPM and are documented in a publication approved within the organization;

(d) ensuring that airworthiness-related activities are conducted in accordance with the TAA-approved EPM and the ADO-approved procedures;

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(e) ensuring that the authorization of personnel performing airworthiness-related tasks and technical airworthiness functions is accomplished in accordance with the TAA-approved EPM and the ADO-approved procedures;

(f) providing guidance on the use of independent airworthiness reviews, and ensuring that they are conducted by authorized individuals in accordance with the ADO-approved procedures;

(g) taking action to correct any practice or procedure that may compromise the airworthiness of an aeronautical product or drawing the matter to the attention of the Type Certificate Holder, and advising the applicable organizational authorities of actions taken, if the situation is beyond the control of the individual;

(h) notifying the TAA of any procedural difficulties or deficiencies that result from airworthiness rules and standards or TAA-approved processes, making recommendations for rectification and/or improvement and advising the applicable organizational authorities of actions taken;

(i) keeping the Type Certificate Holder informed of any significant issues or developments that may adversely affect the airworthiness of an approved type design for an aeronautical product and advising the applicable organizational authorities of actions taken;

(j) monitoring the competencies of individuals to whom technical airworthiness authority has been assigned and of the organization as a whole and informing the TAA of any deficiencies, advising the applicable organizational authorities of actions taken;

(k) revoking technical airworthiness authority from individuals within the organization when it is deemed appropriate to do so;

(l) ensuring that personnel within the organization receive the necessary training and remain knowledgeable and skilled in the conduct of airworthiness-related tasks and technical airworthiness functions;

(m) monitoring the development and progress of DE candidates;

(n) ensuring specifications prepared for the development, test and/or technical support of an approved type design for an aeronautical product are in compliance with the applicable airworthiness rules and standards;

(o) ensuring the category assigned during the development of a design change to an approved type design for an aeronautical product is appropriate;

(p) ensuring adequate engineering competence is applied in the engineering decisions that may affect the airworthiness of an approved type design for an aeronautical product during the airworthiness-related activities conducted within the organization;

(q) issuing airworthiness instructions as applicable regarding aeronautical products in operational service to the Type Certificate Holder when a non-compliance with airworthiness rules and standards or a non-conformance with the approved type design is discovered;

(r) ensuring any issues, problems or service difficulties discovered during design, or engineering support are referred to the appropriate Type Certificate Holder for the approved type design;

(s) providing all necessary information for the TAA when the TAA decides to issue an Airworthiness Directive (AD) to rectify a deficiency;

(t) developing and maintaining a liaison with the Design Authority, and Type Certificate Holder as applicable for the approved type design to the extent required to meet the design and engineering support responsibilities assigned to the organization;

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(u) ensuring that contracts or service level agreements with external agencies are developed and maintained as necessary to enable the ADO to provide the scope and depth of design support required;

(v) ensuring work performed by external agencies that are not accredited or recognized by the TAA, in accordance with 1.4.2.R1, is conducted in accordance with the ADO-approved procedures. The ADO is responsible for the tasks to be performed, the quality of work and for meeting the airworthiness certification requirements for the technical airworthiness functions;

(w) advising the TAA of any changes within the ADO or in support arrangements that will impact the scope and depth of technical airworthiness authority assigned to the ADO; and

(x) ensuring the ACC is used to assist in the management of design support and authorization activities.

(y) ensuring the ADO is subject to adequate quality oversight for its entire airworthiness scope and depth of authority granted by the TAA;

(z) monitoring the adequacy of the corrective action plan raised to document non-compliances with the TAA-approved or recognized EPM and core procedures;

(aa) ensuring that there is, at all times, someone available to carry out the SDE responsibilities.

(ab) during the SDE's absence, formally authorizing a competent individual within the ADO to assume the technical responsibilities as acting SDE (A/SDE). This must be completed by letter, fax or e-mail, and must list any restrictions and/or limitations to that authority, subject to the following limitations:

i. Acting SDE roles may not last beyond four (4) months without TAA approval and the SDE must notify the TAA in circumstances where the SDE is permanently leaving the ADO or leaving for an extended period of time; and

ii. A/SDEs cannot issue authorizations to individuals to perform airworthiness functions within the ADO.

b. **Design Engineer (DE).** The DE is assigned technical airworthiness authority by the SDE to conduct technical airworthiness functions on behalf of the TAA including making findings of compliance, airworthiness approval, TAC and/or granting flight authority, within the ADO.

ADVISORY NOTES

1. *The DE assignment is not attached to any particular position within the ADO but rather is a role that must be performed by competent individuals who meet the applicable eligibility criteria for the respective functional speciality. The competency criteria are similar to those required for the SDE. The specific criteria used by the ADO shall be detailed in the EPM. In this role, the DE is an authorized representative of the TAA.*

2. *One or more DEs may be designated as a Primary DE for a specific functional specialty area. Normally, this Primary DE would have acquired some specialist expertise and/or experience in that area and have the potential to become a SDE. They could be assigned additional responsibilities as detailed in the EPM, such as mentoring a Candidate DE within his/her area of expertise. The Primary DE would normally attend all ACC meetings.*

3. *Within the DND/CAF Airworthiness Program, the use of the term Design Engineer (DE) can be applied to both engineers and technologists.*

(1) **DE Eligibility Criteria.** To be eligible for the assignment of technical airworthiness authority by the SDE as a DE, a person must meet the following criteria:

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ADVISORY NOTE

The scope and depth of airworthiness authority (that is, airworthiness management roles, functions and tasks) assigned to an ADO for a given aeronautical product shall have to be taken into account when determining the required DE knowledge, skills and experience requirements. Specific courses or experience may be required to show compliance to the following criteria as applicable.

(a) **Knowledge.** The following knowledge is required:

i. be a graduate of an applicable engineering discipline from a university or applicable engineering technology course from a college, recognized by the TAA, or in the opinion of the TAA, have equivalent knowledge, gained through other forms of education and training;

ii. be a graduate of a certification specialty course from a recognized training source or, in the opinion of the TAA, have equivalent knowledge, gained through other forms of education and training;

iii. in the opinion of the SDE, have detailed knowledge, gained by formal training and/or work experience, of the technical airworthiness rules and standards and aeronautical product design standards;

iv. in the opinion of the SDE, have detailed knowledge, gained by formal training and/or work experience, of the specific aeronautical products involved;

v. where required, a detailed understanding of the applicable operational requirements and environment;

vi. where the individual conducts flight tests to make findings of compliance or support airworthiness approval, be a graduate from a recognized flight test school or, in the opinion of the TAA, have equivalent knowledge gained through engineering flight test experience; and

vii. demonstrate a detailed understanding of the following topics to the satisfaction of the SDE:

(i) the scope and depth of technical airworthiness authority assigned by the TAA to the ADO and other supporting organizations;

(ii) the airworthiness responsibilities of the ADO for work that is accomplished by both the organization and external agencies through support arrangements;

(iii) the responsibilities of a DE;

(iv) the responsibilities associated with the authorized technical airworthiness functions;

(v) the EPM for the ADO, including associated procedures;

ADVISORY NOTE

Prior to authorizing a DE, within his/her respective engineering specialty, the individual needs to have acceptable knowledge of the EPM including core-engineering procedures. The TAA will evaluate the DE's knowledge during on-site audits.

(vi) the interrelationship and interfaces between Technical Airworthiness Program and Quality Management System requirements; and

(vii) the Certification Basis for the aeronautical product supported by the ADO.

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(b) **Skills.** The DE must be skilled in the following:

i. interpret airworthiness standards;

ii. analyze specifications and procedures employed in the design development or testing of the design of, or a proposed design change, to an aeronautical product to ensure compliance with the applicable airworthiness rules and standards;

iii. assess the category during the development of a design change to the approved type design for an aeronautical product;

iv. propose the Certification Basis during the development of a design change to the approved type design for an aeronautical product;

v. develop certification plans;

vi. determine appropriate means and methods of compliance;

vii. recommend or make findings of compliance;

viii. participate in internal audits and in the development and implementation of corrective action plans; and

ix. assume the responsibilities of the SDE for the airworthiness-related activities of the ADO as specifically authorized by SDE and within the limitations and restrictions imposed.

(c) **Experience.** A DE shall have a minimum of four (4) years of relevant engineering design experience within an ADO, of which six (6) months shall be within the ADO who will be assigning the individual authority. Persons who lack only this level of experience but meet the other criteria should be identified as Candidate DEs for future authorization.

(2) **DE's Responsibilities.** A DE who performs technical airworthiness functions in support of the design and engineering support has the following responsibilities within the limitations and restrictions of the authority assigned by the SDE :

(a) performing the assigned technical airworthiness functions on behalf of the TAA;

(b) ensuring any issues, problems or service difficulties discovered during airworthiness-related tasks or technical airworthiness functions are referred to the SDE;

(c) advising the SDE of any changes within the ADO which will affect the scope and depth of technical airworthiness authority assigned to the ADO;

(d) interpreting airworthiness standards;

ADVISORY NOTE

*An airworthiness rule defines exactly **what** must be achieved or accomplished while airworthiness standards specify the **criteria and/or process for the assessment or demonstration of compliance** with the rule. Interpretation of a standard is permitted because there may exist various means of achieving or accomplishing the desired result and demonstrating compliance with the rule. Interpretation of airworthiness rules is not permitted other than by the TAA.*

(e) ensuring specifications and procedures employed in the design development or testing of the design of, or a proposed design change, to an aeronautical product are in compliance with the applicable airworthiness rules and standards;

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(f) ensuring the category assigned during the development of a design change to the approved type design for an aeronautical product is appropriate;

(g) ensuring adequate engineering competence and independence are applied in the engineering decisions that may affect the airworthiness of an aeronautical product and the airworthiness-related activities and technical airworthiness functions conducted within the ADO;

(h) ensuring that airworthiness reviews are conducted where appropriate;

(i) participating in internal audits to monitor the engineering competency of individuals and the capability of the organization as a whole and participating in the development and implementation of corrective action plans; and

(j) in the absence of the SDE assuming the responsibilities of the SDE for the airworthiness-related activities of the ADO as specifically authorized by the TAA or SDE and within the limitations and restrictions imposed.

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SECTION 3

ADVISORY MATERIAL (NOT ALLOCATED)

NOTE

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PART 1
MANAGEMENT FRAMEWORK

CHAPTER 5 - TECHNICAL AIRWORTHINESS PROGRAM AND AERONAUTICAL PRODUCT STANDARDS

SECTION 1

INTRODUCTION

1.5.1.1 Background

1. The design, manufacture, maintenance and material support of aeronautical products must satisfy a wide range of aviation safety, mission performance, supportability and life expectancy requirements. It commences with the definition of design requirements in a design specification. This design specification is the basis for design development that eventually results in an approved design. Aeronautical products are then manufactured in accordance with the approved design and enter into operational service with the associated approved operating and maintenance procedures. As a result, the inherent safety, mission capability, supportability and life expectancy of aeronautical products depend on the accepted standards applied in the definition, development, manufacture, operation and support of such products.

2. Since the aviation safety, mission performance, supportability and life expectancy requirements may at times conflict with each other, it is essential that the basis for each be traceable to an acceptable standard and the combination provide clear design, operation and support goals, which would ultimately lead to the following:

a. an approved type design which is in compliance with the applicable standards; and

b. an aeronautical product which is in conformance with the approved type design.

3. To achieve and maintain an acceptable level of aviation safety, the Technical Airworthiness Program requires that the design, manufacture, maintenance and material support of military aeronautical products be accomplished in accordance with the applicable airworthiness standards. The minimum essential airworthiness standards are issued or accepted by the TAA as either program-related or product-related airworthiness standards.

4. For a new aeronautical product type, the process commences with the establishment of a certification plan for the proposed type design. This includes the selection of the applicable airworthiness standards, which become the Certification Basis, that defines the minimum essential airworthiness design requirements to ensure the safe operation of an aeronautical product in its intended operating environment. The type certification process as described in Part 2, Chapter 1, ensures compliance with the applicable airworthiness standards during design development resulting in an approved type design. The compliant type design is transformed into airworthy aeronautical products by assuring conformance with the approved type design during manufacture. Finally, the in-service continuing airworthiness is assured by maintaining conformance to the approved type design and employing the applicable airworthiness standards in the various activities that occur throughout the life cycle of the type design and associated aeronautical products.

1.5.1.2 Program-related Airworthiness Standards

1. The various program-related airworthiness standards are issued by the TAA in the TAM. For example, for a new type design, this commences with the Initial Airworthiness element of the Technical Airworthiness Program described in Part 2 of the TAM. For in-service aeronautical products, it continues with the Continuing Airworthiness element of the Technical Airworthiness Program described in Part 3 of the TAM. Additional program-related standards that are applicable throughout the life cycle of the type design and associated aeronautical products are provided in Parts 1 and 5 of the TAM.

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2. Program-related airworthiness standards are not direction in their own right. They are only applicable when directed by a technical airworthiness rule as published in the TAM.

1.5.1.3 Product-related Airworthiness Standards

1. The product-related airworthiness standards, often referred to as airworthiness design standards, define the inherent safety of an approved type design as they provide the baseline for the development and the measurement of compliance of the type design from an airworthiness perspective.

2. Within the Technical Airworthiness Program, acceptable airworthiness design standards are published by the TAA in the Airworthiness Design Standards Manual (ADSM). This collection of standards, consists of:

a. a core group of airworthiness design standards including airworthiness standards issued by Transport Canada in support of Part 5, "Airworthiness" of the Canadian Aviation Regulations (CARs) and defence standards issued by UK Ministry of Defence (MOD). In some cases, these standards may be tailored or implementation guidance provided as necessary to meet DND/CAF unique requirements;

b. unique DND/CAF airworthiness design standards that may be added to and/or replace the standards in the core group;

c. ratified international agreements that may be added to and/or replace the standards in the core group;

d. other modified civil and military airworthiness design standards that may be added to and/or replace the standards in the core group; and

e. equivalent or alternative airworthiness design standards that may replace the standards in the core group.

1.5.1.4 Airworthiness Design Standards Manual (ADSM)

1. The ADSM is the companion document to the Technical Airworthiness Manual (TAM) and is used both during the initial type certification of a new type design and the continuing airworthiness activities for in-service aeronautical products. In addition to the airworthiness design standards, it provides associated technology and engineering specialty process standards acceptable to the TAA. It also contains advisory material, which includes:

a. the accepted interpretation of standards;

b. guidance in selection of an acceptable means of compliance; and

c. general information on airworthiness-related subjects.

2. The ADSM is divided into five Parts as follows:

a. **Part 1 - Introduction.** This Part introduces the concept of standards and specifications and their general use in the design process. It provides an understanding of the ADSM layout and the meaning of the various portions of the manual. It also establishes the change process for the contents of the manual.

b. **Part 2 - General Airworthiness Design Standards.** This Part provides general guidance material for the selection of military and civil standards for DND-registered civil and military pattern aeronautical products. This information is key when using standards issued by other regulatory authorities and provides an analysis along with the advantages and disadvantages of using their design codes. This part should be used when the subject matter has not been addressed sufficiently for a specific application in Parts 3, 4 and 5.

c. **Part 3 - Aeronautical Product Design Standards.** This Part provides the airworthiness design standards for all DND-registered aeronautical products whether they are of military or civil pattern. This part is organized into aeronautical product types.

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d. **Part 4 - General Standards - Technology and Engineering Specialities.** This Part provides standards for specific engineering specialities such as safety assessment, software development, human engineering, environmental effects and electromagnetic compatibility. It also provides standards for technologies that may apply to any aeronautical product, such as Built-in-Test (BIT) and oxygen generating systems.

e. **Part 5 - Material Design Specification and Standards.** This Part details the minimum maintenance standards and acceptable methodologies (e.g., MSG 3).

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SECTION 2

RULES AND STANDARDS (NOT ALLOCATED)

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SECTION 3

ADVISORY MATERIAL (NOT ALLOCATED)

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PART 1
MANAGEMENT FRAMEWORK

CHAPTER 6 - QUALITY MANAGEMENT SYSTEM REQUIREMENTS

SECTION 1

INTRODUCTION

1.6.1.1 Purpose

1. A quality management system is a means through which an organization manages and operates all of its activities, by including quality planning, corrective and preventive actions, and quality improvement. A quality management system will satisfy the internal management needs of the organization, the individual customer requirements and ensure regulatory requirements are consistently met. For this reason, implementation of an effective quality management system in all organizations that conduct airworthiness-related activities is an essential element of the Technical Airworthiness Program.

1.6.1.2 Overview

1. In order to comply and conform with airworthiness requirements, a tight control over all airworthiness-related activities is necessary. A quality management system contributes significantly to the achievement of airworthiness by providing an effective management framework to establish, document, control and improve airworthiness-related activities, as required by the Technical Airworthiness Program.

2. The contribution that the quality management system makes to aviation safety is based on the principle "Say what you do, do what you say, check it and act on the difference." Therefore, all organizations that conduct airworthiness-related activities must:

a. **Plan -** "Say what you do" by documenting the process used in the performance of airworthiness-related activities.

b. **Do -** "Do what you say" by performing the airworthiness-related activities in accordance with the documented processes and procedures.

c. **Check -** "Check it" by using periodic audits to ensure compliances to airworthiness-related processes and procedures.

d. **Act -** "Act on the difference" by applying corrective and preventive measures on the identified root cause for all non-compliances and deficiencies documented during audits.

1.6.1.3 Quality Management System Requirements

1. The quality management system requirements of the Technical Airworthiness Program are established by:

a. defining acceptable quality management standards; and

b. requesting independent evaluations of an organization's quality management system at periodic intervals.

2. **Acceptable Quality Management Standards.** Within the Technical Airworthiness Program, an acceptable quality management standard must:

a. provide a disciplined approach to airworthiness-related processes and applicable procedures, and ensure rigorous adherence to them;

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b. cater to the scope and depth of technical airworthiness authority assigned to an organization, and be appropriate for its involvement in the design, manufacture, maintenance and/or material support of aeronautical products;

c. provide for quality planning, quality control, quality assurance, quality corrective and preventive actions and quality improvement throughout the organization; and

d. support the airworthiness requirements.

3. **Quality Management System Evaluation.** Periodic independent quality management system evaluation is a requirement of the Technical Airworthiness Program. The process must be a formal evaluation of an organization's quality management system by a competent evaluator to ensure that the system continues to comply with a quality management standard acceptable to the TAA.

4. Organizations must demonstrate ongoing compliance with the acceptable quality management standard. Ongoing compliance is confirmed by regular quality management system reviews and audits by an evaluator. Audits conducted by an evaluator may reveal deficiencies that could have an impact on the organization's airworthiness-related processes and procedures and which, in turn, could affect the organization's compliance with applicable airworthiness rules and standards. Audit reports will assist the TAA in assessing the ongoing compliance of the organization with applicable airworthiness rules and standards. Therefore, the TAA will want to establish a means of having access to all airworthiness-related observations raised during quality management system audits by an evaluator, together with any associated corrective or preventive action plans.

ADVISORY NOTE

Organizations that provide Corrective Action Plans (CAPs) should include a root cause (if there is one), an immediate corrective action (this can be short term or permanent), prevention (which includes how the unit will prevent this from happening again), traceability (which can include examples such as quality system change records and Publication Discrepancy Reports (PDRs)), and an implementation date.

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SECTION 2

RULES AND STANDARDS

1.6.2.R1 Quality Management System (QMS) Requirements

1. An organization seeking TAA airworthiness accreditation or recognition in accordance with Part 1, Chapter 4, shall have:

   a. a QMS compliant with a standard acceptable to the Technical Airworthiness Authority (TAA) in accordance with 1.6.2.S1.1; and

   b. an evaluator acceptable to the TAA, in accordance with 1.6.2.S1.3, that confirms the compliance of the organization's quality management system.

2. Acceptable organizations shall allow the TAA access to all observations raised during both internal and external QMS audits, together with any associated corrective or preventive action plans.

1.6.2.S1 Quality Management System (QMS) Requirements

1. Quality Management System standards acceptable to the TAA include:

   a. Air Force 9000 Plus - A Quality Standard for Aerospace Engineering and Maintenance (C-05-005-P11/AM-001); and

   b. Third party, industry-recognized standard - Quality Management Systems - Requirements.

ADVISORY NOTE

Examples of acceptable third party QMS include: NADCAP for specialized processes within a manufacturing organization, AS9100 and EN9100 for Acceptable Maintenance Organizations (AMO), ISO9001 and equivalents as a general QMS, and AS7103 and AS7104 for distributors and suppliers of aviation parts. The TAA may grant special consideration or equivalent status to organizations. Examples where this may be applicable are:

a. *civilian contractors seeking accreditation or recognition who have previously obtained compliance with another quality standard;*

b. *an organization that obtained civilian regulatory approval (i.e., TC, US FAA and JAA) status as an Acceptable Maintenance Organization (AMO) or Acceptable Design Organization (ADO);*

c. *a software development organization evaluated against the Capability Maturity Model (CMM) developed by the Carnegie Mellon University Software Engineering Institute, ISO 9000-3 or any other standard deemed acceptable by the TAA; and*

d. *small organizations that conduct limited airworthiness functions that may not need a full quality management system that is compliant with one of the major standards.*

2. Submissions for special consideration or equivalent status of a different QMS shall be submitted to the TAA who reserves the right to impose additional special conditions on the organization involved. Each submission will be treated on an individual basis, will be recorded by the TAA and will be subject to periodic re-evaluation.

3. Quality management system evaluators acceptable to the TAA include:

   a. For Air Force 9000 Plus Quality Standard: 1 Canadian Air Division (1 Cdn Air Div)/AQM; and

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b. For Third Party Registered Quality Management Systems:

(1) Third party evaluation body accredited by the Standards Council of Canada or by another national or international accreditation body acceptable to the TAA; and

(2) Director Quality Assurance (DQA) through the DND Quality Assurance Program.

ADVISORY NOTE

Other evaluators may be acceptable to the TAA and advice should be sought from TAA staff regarding their acceptability. Factors that will be considered in the assessment of an evaluator include knowledge of and experience with the selected quality management standard, competence of the auditors and independence from the organization being audited.

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SECTION 3

ADVISORY MATERIAL

NOTE

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1.6.3.1 Quality Management System Documentation Hierarchy

1. An essential requirement of an effective quality management system is the establishment of a logical and systematic documentation hierarchy for the organization. Quality management system documentation normally consists of a quality manual and other associated documents or publications which describe in detail how an organization conducts its activities. This document hierarchy must adequately cover, within the scope of the quality management system, all activities conducted within the organization and includes policies, processes, procedures and work instructions with cross-references, as necessary, to more detailed information.

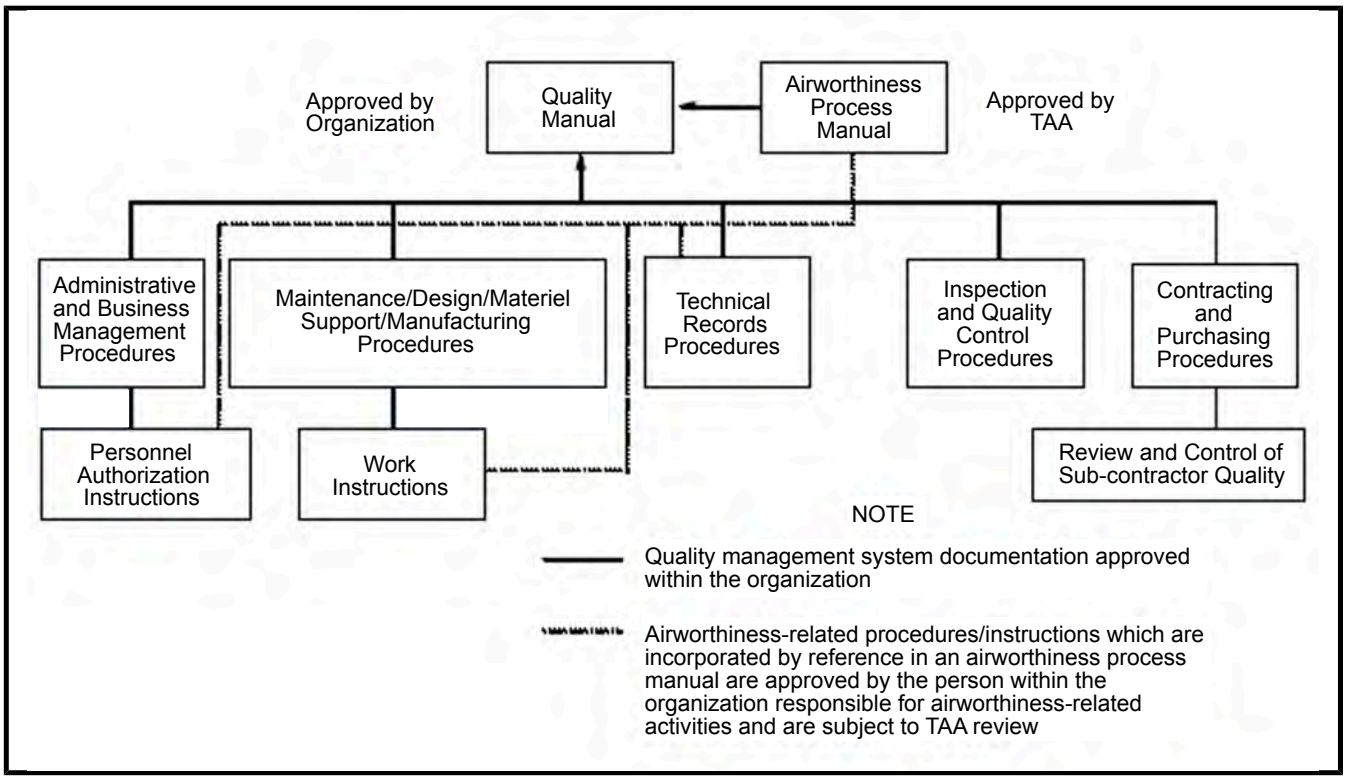

Figure 1-6-3-1 Quality Management System Documentation Hierarchy

2. The quality management system documentation includes areas, such as administration, personnel, environment, finance, internal business procedures, technical procedures and contracting. The applicable Airworthiness Process Manual (APM), as required by Part 1, Chapter 4 to be deemed a TAA-Acceptable Organization, is part of this quality management system documentation hierarchy. The interrelationship of the documents within this quality management system documentation hierarchy may at times appear confusing because the documents may originate from various requirement sources, such as quality, financial, technical, business and airworthiness. These requirements at times may overlap or demand different approval authorities.

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The quality management system documentation hierarchy for a typical TAA-Acceptable Organization is depicted in Figure 1-6-3-1, including the different approval authorities for the quality manual and the APM.

3. An organization's APM or DND Airworthiness Supplement (DAS) is approved by the TAA during the TAA accreditation or recognition process, respectively, as described in Part 1, Chapter 4. All airworthiness-related procedures and work instructions incorporated by reference in the APM are approved and certified as compliant by the person responsible for the airworthiness-related activities of the organization, prior to TAA approval of the APM. These airworthiness-related documents incorporated by reference must normally be submitted for review to the TAA during the accreditation or recognition process. Other quality management system documentation is controlled and approved entirely within the organization. However, the TAA may request a copy of any procedure referenced to within the APM prior to conducting any audits.

4. There are many ways in which the documentation hierarchy for an organization can be structured depending on factors such as the command and control requirements, the airworthiness-related activities performed, the scope and depth of technical airworthiness authority assigned and the quality standard selected. From an airworthiness perspective, virtually any documentation hierarchy may be considered acceptable as long as it is logical and the interrelationship between the TAA-approved APM and other documents is well-defined.

5. Amendments or revisions to quality management system documentation are approved internally within an organization except for changes to the TAA-approved APM. Amendments to the TAA-approved APM must be forwarded to the TAA for approval in accordance with Part 1, Chapter 4, prior to implementation by the organization. Amendments to other documents incorporated by reference in the TAA-approved APM, may be implemented immediately by the organization provided:

a. the information remains compliant with the APM and the TAM requirements;

b. the documents are reviewed and approved by the person responsible for the airworthiness-related activities of the organization; and

c. a copy of the revised information is submitted for TAA's review and information.

1.6.3.2 Airworthiness System / Quality Management System Compliance Requirement Interrelationship

1. To obtain TAA recognition or accreditation in accordance with Part 1, Chapter 4, an organization requires a quality management system compliant with a quality standard acceptable to the TAA. Recognized organizations normally have established quality systems, however, it may not be possible for a new organization to demonstrate to an independent evaluator full compliance with the quality standard prior to TAA accreditation. In this situation, a TAA accreditation may be awarded to an organization even though all of the requirements of the quality standard for the airworthiness-related activities or technical airworthiness functions have not been completely implemented. In such a case, the organization seeking accreditation must provide the TAA with a detailed implementation plan and schedule including the measures, checks and balances used to assure airworthiness in the interim. Full TAA accreditation is awarded once all airworthiness-related activities requirements have been satisfactorily implemented.

2. The extent of quality standard compliance that may be acceptable for a TAA accreditation includes:

a. **A Compliant Quality Management System.** As confirmed through an independent evaluator, but the scope of registration does not include all airworthiness-related activities for which TAA accreditation is being sought; and

b. **A Non-compliant Quality Management System.** Procedures developed and awaiting sufficient time in use within the organization for assessment by an independent evaluator.

3. In the first case, the organization has already documented and implemented the necessary procedures required by the acceptable quality standard, mainly those procedures that provide for the management framework such as quality planning, quality assurance and corrective/preventive actions. The independent quality management system evaluation verified that the organization was following these procedures. However, the procedures must

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be amended and/or the scope of the quality management system evaluation expanded to cover additional airworthiness-related activities and/or technical airworthiness functions. In this case, the TAA will request a plan on how and when the organization intends to expand the scope of the quality management system evaluation. Notwithstanding the above, independent quality management system evaluation to the extended scope must be obtained prior to full TAA accreditation.

4. In the second case, the organization requires TAA accreditation in order to use the procedures associated with airworthiness-related activities for sufficient time in order to generate sufficient objective evidence of compliance of the quality management system. However, the organization's quality management system must be in full compliance prior to full TAA accreditation. Since TAA accreditation and a fully-compliant quality management system are interdependent, a phased approach may be used as follows:

a. the organization develops and implements a quality management system based on a quality standard acceptable to the TAA;

b. the organization submits an application to the TAA for accreditation with a detailed description of their quality management system (usually through submission of their quality manual and/or procedures as determined by the TAA on a case by case basis) and an implementation plan to achieve an independent evaluation of their quality management system;

c. the TAA reviews the submitted quality management system description and implementation plan, as part of the airworthiness accreditation desktop audit and (if necessary) the on-site airworthiness accreditation audit. The TAA grants airworthiness accreditation if satisfied that the proposed quality management system is adequate "with restrictions and limitations on technical airworthiness authority as deemed necessary";

d. the organization has their quality management system evaluated for full compliance to the quality standard after sufficient time for use of procedures; and

e. the TAA performs on-site airworthiness audit and grants TAA accreditation.

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PART 2
INITIAL AIRWORTHINESS

CHAPTER 1 - AERONAUTICAL PRODUCT TYPE CERTIFICATION PROCESS

SECTION 1

INTRODUCTION

2.1.1.1 Background

1. As explained in Part 1, Chapter 1, the provisions of the *Aeronautics Act* place legal responsibility on the Minister of National Defence (MND) to establish, administer and enforce necessary rules for the safe conduct of military aviation in Canada. This responsibility is partially fulfilled by assuring the initial airworthiness of all Canadian military aeronautical products prior to their introduction into service. The manner in which this is done depends on the type of aeronautical product and whether it has been subject to prior airworthiness certification by another airworthiness regulatory authority. Within the Technical Airworthiness Program, there are two formal airworthiness certification processes leading to airworthiness approval of new aeronautical products which are as follows:

a. **Type Certification.** The type certification process, detailed in this chapter, is used for new military aircraft, Unmanned Aircraft Systems (UAS), engine and propeller types; and

b. **Equipment Certification.** The equipment certification process is used for other aeronautical products, associated systems, equipment and component parts intended for installation on an aircraft where preliminary airworthiness certification is feasible and advisable. Eventual incorporation into the approved type design of an aircraft will require airworthiness certification for the integration and specific requirements of the installation. Equipment certification may be used for appliances, mission equipment, life support equipment and weapons.

2. The intention of the Technical Airworthiness Program is not to proceed with the type certification of an engine or propeller type design that is separate from the aircraft type on which it is installed. Exception to this will be considered by the Technical Airworthiness Authority (TAA) when there is a distinct advantage for Department of National Defence (DND) to maintain a separate DND Type Certificate for an engine or propeller. In most cases, the airworthiness approval for an engine or propeller type design will be included as part of the airworthiness approval granted to an aircraft type design during the type certification process. Therefore, for most military aeronautical products, a Type Certificate will only be issued to aircraft types. Similarly, the equipment certification process will only be used for other aeronautical products such as appliances, equipment and systems when there is a justified need or a distinct advantage for DND, as determined by the TAA.

2.1.1.2 Type Certification

1. Aeronautical product type certification is the process leading to the formal airworthiness approval of an aircraft, engine or propeller type design and the subsequent issue of a DND Type Certificate. Airworthiness approval is certification that a type design is in compliance with the applicable airworthiness and environmental standards. Type certification is an extensive and complex undertaking, the legal basis for which is traceable to the responsibilities and powers of the MND as specified in the *Aeronautics Act*. The authority for Type Certification of military aeronautical products intended for use in Canada is delegated to the TAA by the MND.

2. The Type Certification process begins with the preparation of a Statement of Operating Intent (SOI) by the intended user of the aeronautical product. An initial hazard analysis of the proposed aeronautical product type design for the intended usage and operating environment is then conducted. The selection of the applicable airworthiness standards for the aeronautical product type then commences based on the SOI and the initial hazard analysis. These applicable airworthiness standards will eventually be submitted to the TAA as the proposed Certification Basis, for the aeronautical product type design. However, prior to submission of the proposed Certification Basis, a Certification Plan is prepared by the applicant for the DND Type Certificate and submitted to the TAA for approval.

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3. The Certification Plan describes the proposed process for the development and subsequent TAA approval of the Certification Basis, the intended Compliance Program and a schedule of related activities. The Certification Plan is intended to ensure that the TAA is fully aware of the applicant's intentions and expectations, and to provide the applicant with an initial assurance that the type certification activities can reasonably be expected to result in the issue of a DND Type Certificate. The Compliance Program then follows during which inspections, analyses and tests are conducted to prove that the proposed type design is in compliance with the Certification Basis. These compliance demonstration results are the basis for the findings of compliance made by or on behalf of the TAA. Throughout the Compliance Program, the required airworthiness documentation is delivered to the TAA for review and/or approval. When the TAA is fully satisfied that all areas have been adequately addressed and that the type design is compliant with the Certification Basis, airworthiness approval is granted and a DND Type Certificate issued.

4. In lieu of a full certification program, as described above, a DND Type Certificate may be issued based in part upon another airworthiness regulatory authority's document, which is equivalent to a DND Type Certificate, providing that:

a. the document is issued by an agency, either civil or military, which is recognized by the TAA;

b. the airworthiness standards utilized are recognized by the TAA;

c. the intended usage of the aeronautical product type design is comparable; and

d. the continuing airworthiness aspects are adequately addressed.

5. After the DND Type Certificate is issued, any proposed design change that affects the airworthiness of the approved type design requires airworthiness approval by the TAA prior to incorporation into that approved type design. Depending upon the scope and nature of proposed design changes, it may be necessary to issue a new DND Type Certificate for that type design, and in the case of an aircraft type design, the assignment of a new designation to the aircraft type. Details of the design change certification process are provided in Part 3, Chapter 2.

6. A Restricted Type Certificate may be issued for UAS operating only in restricted airspace, in a Theatre of Operations or over international waters under Due Regard.

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SECTION 2

RULES AND STANDARDS

2.1.2.R1 Airworthiness Approval of an Aeronautical Product Type Design

1. The TAA shall grant airworthiness approval to an aeronautical product type design that meets the requirements specified in 2.1.2.S1.

ADVISORY NOTES

1. *The purpose of the Technical Airworthiness Program is to only grant airworthiness approval to military aeronautical products that in the opinion of the TAA are in the interests of DND. Therefore, an applicant should consult with the TAA prior to commencing the airworthiness approval process described in 2.1.2.S1.*

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2. *The Program's goal is to give maximum credit to the airworthiness approval or type certification of an aeronautical product type design by other airworthiness regulatory authorities wherever possible. However, a duty of care must be exercised to provide assurance that the previous airworthiness approval meets the intent of the Technical Airworthiness Program and the approved type design is applicable to the intended operational use. This duty of care requirement is normally satisfied by a TAA review of the technical data associated with the existing airworthiness approval of the type design. The scope and depth of the TAA review depends on the following factors:*

   a. *TAA recognition of the airworthiness regulatory authority;*

   b. *complexity of the aeronautical product;*

   c. *intended operational usage of the aeronautical product;*

   d. *technology and unusual design features; and*

   e. *in-service history of the aeronautical product.*

3. *The TAA review of the existing airworthiness approval of the type design may range from a "limited review" of associated technical data to the extent necessary to ensure compliance with specific or unique DND/CAF airworthiness requirements to a "comprehensive review" of associated technical data including:*

   a. *a comparison of the Certification Basis to one selected, in accordance with 2.1.2.S3;*

   b. *a detailed study of the compliance program including the means of demonstrating compliance and the finding authority;*

   c. *a detailed study of the proof of compliance data to validate its adequacy;*

   d. *a detailed evaluation of the interface between the aeronautical product and unique DND/CAF equipment or systems such as life support equipment; and*

   e. *a flight evaluation program.*

4. *In addition, a comprehensive review may also involve a detailed investigation for each step of the airworthiness approval process, described in 2.1.2.S1, to enable a declaration of the following:*

   a. *the Certification Basis is appropriate;*

   b. *competent personnel developed the design;*

   c. *the means of demonstrating compliance is appropriate;*

   d. *the proof of compliance is adequate;*

   e. *authorized personnel made the findings of compliance;*

   f. *the airworthiness documentation is adequate, as defined in 2.1.2.S1.10, including:*

      (1) *the information and data necessary to define the approved type design;*

      (2) *the compliance record;*

      (3) *the Instructions for Continued Airworthiness;*

      (4) *the flight manual or operating instructions; and*

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(5) the in-service support plan.

g. *the proof of function and reliability is adequate, as required by 2.1.2.R7; and*

h. *the Type Certificate Data Sheet and Type Record, as required by 2.1.2.S8 are adequate.*

2.1.2.S1 Airworthiness Approval of an Aeronautical Product Type Design

1. The steps leading to the airworthiness approval for a proposed type design are as follows:

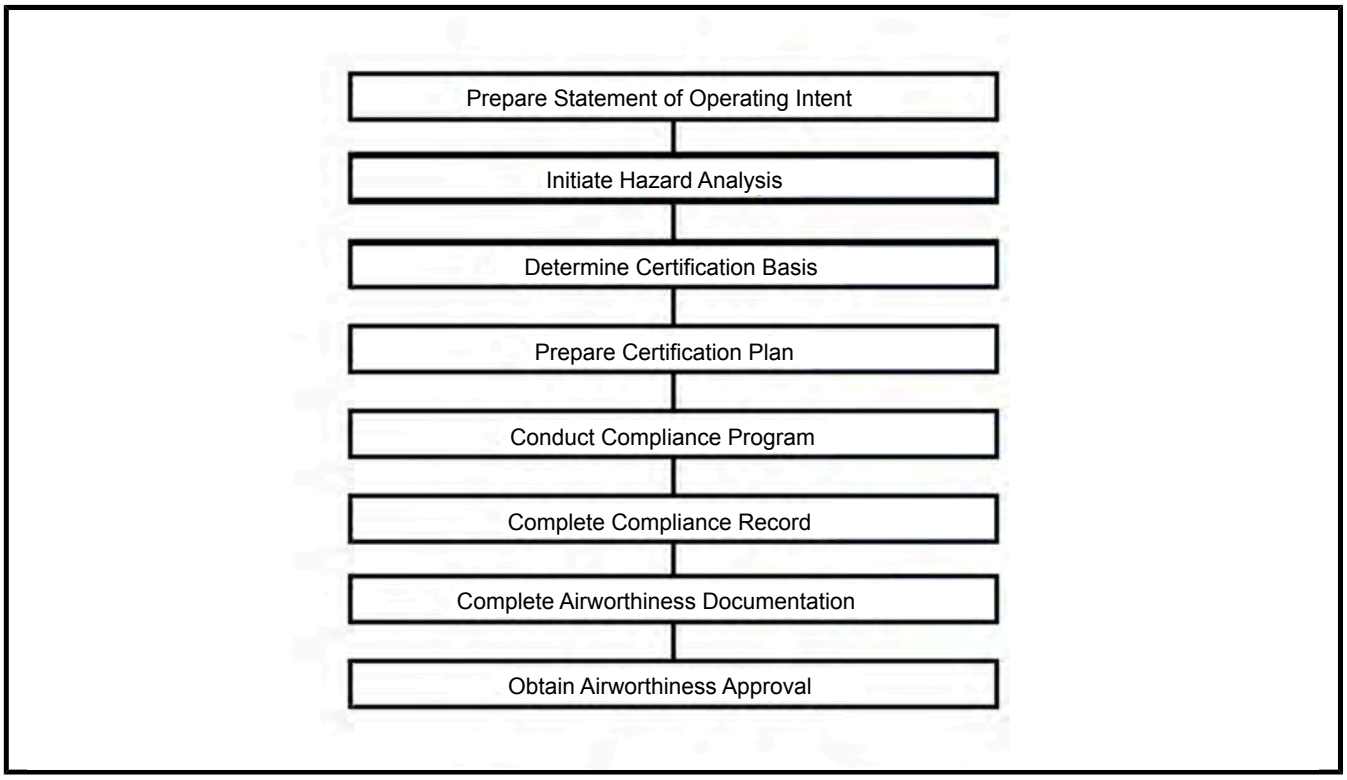

Figure 2-1-2-1 Type Design Airworthiness Approval Process

2. **Statement of Operating Intent (SOI).** The SOI identifies the intended roles, missions, tasks and in-service usage of the proposed aeronautical product type design in sufficient detail to permit an engineering analysis and an assessment to determine and apply the appropriate airworthiness standards. It is developed by the intended users of the aeronautical product and approved by the OAA prior to submission to the TAA. The requirements of an SOI are detailed in Annex A, of this chapter.

3. **Hazard Analysis.** The SOI for the aeronautical product type shall be reviewed and a hazard analysis shall be initiated to determine possible sources of safety risk.

ADVISORY NOTES

1. *Specific roles, missions and tasks within a defined environment are described in the SOI. The accomplishment of these roles, missions and tasks is facilitated by the particular set of functions that are implemented in the type design using various design approaches and technologies.*

2. *The manner in which these design approaches and technologies are used or changed and integrated together will result in design characteristics that can be more or less hazardous. This may involve hardware, software and human operator interface considerations.*

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3. *The purpose of the hazard analysis is to systematically identify potential hazardous characteristics of the type design. The results of the hazard analysis are used in selecting the applicable airworthiness standards, during design development and to support the acceptance of any associated airworthiness risk assessed, in accordance with Part 5, Chapter 1. Refinement of the hazard analysis is necessary throughout the design development process and provides the basis for any required safety assessments conducted.*

4. **Certification Basis.** The Certification Basis for a proposed type design shall be determined, in accordance with 2.1.2.R3, based on the SOI and the initial hazard analysis.

ADVISORY NOTE

TAA approval of the Certification Basis does not occur until airworthiness approval of the proposed type design is granted, in accordance with 2.1.2.S1.11. This assures that the proposed Certification Basis selected at the beginning of the certification process remains appropriate for the final result of the design development. In some cases, it may be necessary to amend or include additional requirements in the proposed Certification Basis as the development of the design progresses.

5. **Certification Plan.** This Plan describes the intended certification process that leads to TAA airworthiness approval of the proposed type design. It shall be produced by the applicant and submitted for TAA approval, in accordance with 2.1.2.R2. The Certification Plan shall outline the proposed certification program from the beginning of the development of the proposed Certification Basis to the issue of a DND Type Certificate. It shall describe the major activities in the process and provide a proposed schedule of activities. The Certification Plan provides the TAA with an awareness of the Applicant's intentions and expectations. Upon TAA approval, the Certification Plan provides the applicant with a reasonable assurance for the eventual issue of a DND Type Certificate for the proposed type design.

ADVISORY NOTE

The Applicant is the organization (or representative individual) applying for the Type Certificate (typically a Project Management Office (PMO)), or, in the case of an in-service design change, for airworthiness approval (typically the TCH organization).

6. **Compliance Program.** The compliance program shall systematically and comprehensively prove compliance with the Certification Basis. A compliance program consists of the following steps:

a. produce a compliance matrix, as described in 2.1.2.S1.7;

b. submit the compliance matrix for TAA approval;

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ADVISORY NOTES

1. *Submission of the compliance matrix initially only results in TAA approval-in-principle. To ensure the compliance matrix remains valid throughout the compliance program, changes may be necessary as a result of several factors including:*

   a. *amendments or additions to the Certification Basis;*

   b. *design approaches and technologies incorporated during design development; and*

   c. *inadequacy of initial proposed means of compliance.*

2. *TAA approval-in-principle of the compliance matrix provides:*

   a. *agreement with the listed airworthiness certification requirements and the proposed means of compliance; and*

   b. *authorization of the named finding authorities to make a finding of compliance on behalf of the TAA.*

3. *Final TAA approval is normally not granted until all entries in the compliance matrix are completed and it becomes the compliance record, in accordance with the 2.1.2.S1.9.*

c. conduct and document demonstrations of compliance; and

d. record findings of compliance in the compliance matrix.

7. For each requirement in the Certification Basis, the compliance matrix shall include provisions for:

   a. the airworthiness certification requirement, including a description of the requirement and identification, revision number and date of the applicable airworthiness standard;

   b. the means of compliance;

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ADVISORY NOTES

1. *A means of compliance is the technique used to demonstrate compliance with the applicable airworthiness requirement in the Certification Basis. The three basic means are: description, analysis or test. Selection of an appropriate means of compliance for each requirement in the Certification Basis should be based on the minimum effort necessary to enable a declaration of compliance to be made unless a means of compliance is specifically stated in the applicable airworthiness standard, such as ".... must be shown by test....";. For example, analysis should be selected rather than test for cost reasons provided the analysis can adequately demonstrate compliance for the particular requirement. Examples of each means of compliance are as follows:*

   a. ***Description -*** *engineering inspection, vendor data and statement, service experience, drawing or evidence of approval, such as FAA/TSO;*

   b. ***Analysis -*** *failure modes and effect analysis (FMEA), structural loads analysis, stress analysis, electrical load analysis and software evaluation and documentation; and*

   c. ***Test -*** *flight test, ground test, fatigue test, simulation, fire test, environmental test, and functional test. The publication C-05-020-007/AM-000* - Policy and Procedures - Flight Test Orders for the Canadian Forces - *defines the DND policy and requirements for flight test and evaluation, as well as related ground testing items that are subject to the requirements of the* DND/CAF Airworthiness Program *by or on behalf of the CAF.*

2. *For requirements in the Certification Basis that do not require a demonstration of compliance, the following may be used for the means of compliance:*

   a. ***Exempt -*** *may be used when an exemption has been granted by the TAA, in accordance with 2.1.2.S3.3 (may only be granted by TAA);*

   b. ***Deviation -*** *may be used when a deviation has been granted by the TAA, in accordance with 2.1.2.S3.3 (may only be granted by TAA);*

   c. ***Equivalent Safety -*** *may be used when an equivalent safety finding has been issued by the TAA (may only be granted by TAA);*

   d. ***Not Applicable -*** *may be used if the particular requirement does not apply to the type design of the aeronautical product; and*

   e. ***Noted -*** *may be used if the particular requirement applies but no demonstration of compliance is necessary (for example: 533.11 Applicability).*

c. the proof of compliance including reference to any substantiating data or report; and

d. the finding of compliance. A Finding of Compliance is a technical airworthiness function, as defined in 1.3.1.7.2, which must be performed by the TAA or an authorized individual. In performing this airworthiness function, the following requirements must be followed:

   (1) the Finding of Compliance section of the compliance matrix must include:

      (a) the finding authority identification;

      (b) the finding result;

      (c) the finding date; and

      (d) the finding authority signature.

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(2) authorized individuals may include:

(a) an individual assigned technical airworthiness authority, in accordance with Part 1, Chapter 4, to make a finding of compliance on behalf of the TAA;

(b) an individual assigned technical airworthiness authority as a member of TAA staff; or

(c) an individual authorized as a Finding Authority for the specific compliance program.

ADVISORY NOTE

An individual, other than TAA Staff, would normally not be authorized to make a Finding of Compliance if a subjective Finding of Compliance is required, or a Finding of Compliance involves the following:

1. ***Structures***

   (1) basic loads analysis;

   (2) structural test programs;

   (3) airframe fatigue and damage tolerance calculations; and

   (4) loads predicted by aerodynamic analysis.

2. ***Propulsion***

   (1) engine or propeller test programs;

   (2) engine or propeller icing programs; and

   (3) engine mounts.

3. ***Flight Sciences***

   (1) flutter and dynamic analysis; and

   (2) stores clearance.

4. ***Mechanical, Electrical or Avionics Systems***

   (1) review and approval of fault conditions in a system critical to the safe flight and landing of an aircraft.

5. ***Software***

   (1) review and approval of fault conditions in a system critical to the safe flight and landing of an aircraft.

6. ***Maintenance Programs***

   (1) airworthiness limitation; and

   (2) replacing the primary source document used to develop the maintenance schedule, as defined in Part 5, Chapter 3.

7. ***Flight Manual***

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8. An applicant shall ensure the TAA has the necessary access to an aeronautical product and associated data during the compliance program to determine or review compliance with the Certification Basis. This access may be required to:

a. make an engineering assessment;

b. conduct an inspection;

c. review a finding of compliance; and/or

d. participate in or witness any planned test.

ADVISORY NOTES

1. During the compliance program, issues may arise where a certification requirement may be insufficient (e.g., the lack of fly-by-wire certification requirements), or where a certification requirement may not be fully met. In this case, the TAA will raise Issue Papers to document the technical issues and request that the Applicant provide a response to address those issue(s). Issue Papers may be iterative, but they must be closed by the TAA prior to granting Airworthiness Approval for the Type Design.

2. Special Conditions will be promulgated by the TAA when new certification requirements are required to be added to the certification basis. TAA Special Conditions must be preceded by Issue Papers, which document the deficiency and explain the need for the Special Condition.

9. **Compliance Record.** The means of compliance, the reference to the proof of compliance, the finding result, the finding date and the finding authority signature are recorded in the compliance matrix for each requirement in the Certification Basis as the compliance demonstration progresses. When all requirements in the Certification Basis have been appropriately addressed, the compliance matrix is approved by the TAA and becomes the compliance record for the approved type design.

10. **Airworthiness Documentation.** The applicant for the airworthiness approval of a proposed type design shall submit or provide access to, for TAA review and/or approval, the applicable data and documents as specified in this chapter and detailed in the Certification Plan. This may include, as applicable, depending on the complexity and specifics of the proposed type design, the following:

a. the documents necessary to define the design features of the approved type design, as specified in 2.1.2.S1.12;

ADVISORY NOTE

Initially, the documents necessary to define the type design consist of the data or information to enable a finding of compliance to be made leading to airworthiness approval of the type design. However, additional data or information may also be required by the TAA in order to monitor that the:

a. *manufacture of aeronautical products is in conformance with the approved type design; and*

b. *in-service support to both the type design and aeronautical products such as the development of design changes is, in accordance with Part 3, Chapter 2, and the procurement or manufacture of aviation replacement parts is, in accordance with Part 5, Chapters 2 and 4, respectively.*

b. the compliance record, in accordance with 2.1.2.S1.9.

ADVISORY NOTE

The proof of compliance data and documentation which forms part of the Type Record for the approved type design as defined in 5.5.2.S1, need not be delivered if provisions are made for

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retention of the documents and TAA access as long as the aeronautical product type remains in service.

c. the Instructions for Continued Airworthiness (ICA), in accordance with 2.1.2.R4;

d. the aircraft flight manual or operating instructions, in accordance with 2.1.2.R5; and

e. the in-service support plan to address the continuing airworthiness requirements of the aeronautical product type during operational service, in accordance with 2.1.2.R6.

ADVISORY NOTES

1. *All of the above documents, data or information need not be completed prior to the granting of airworthiness approval of the proposed type design, provided a TAA-approved plan exists for their development, review and/or approval, except where they are required to demonstrate compliance. The outstanding documents should be addressed in the in-service support plan, in accordance with 2.1.2.R6.*

2. *A Master Minimum Equipment List (MMEL) is a TAA-approved document created specifically to regulate the dispatch of an aircraft type with inoperative equipment. An MMEL is not a mandatory regulatory requirement; however, if it is to be produced, it is normally developed and approved during the type design phase. Guidance for the development of an MMEL can be found in Part 2, Chapter 6.*

3. *Data approval is only granted once, in the official language in which the data was originally written. Translation of approved data does not require an airworthiness approval. It is the responsibility of the Type Certification Holder to ensure that appropriate translation services are in place, which will provide accurate translations of approved data.*

11. **Airworthiness Approval.** Airworthiness approval by the TAA of a proposed type design for an aeronautical product certifies that:

a. the Certification Basis is appropriate, and therefore, formally approved;

b. competent personnel conducted development of the design;

c. appropriate means of demonstrating compliance were utilized;

d. adequate proof of compliance was provided;

e. competent and authorized persons made the finding of compliance for each item listed in the Certification Basis; and

f. the airworthiness documentation submitted, as discussed in 2.1.2.S1.10, has been reviewed or approved as required, in accordance with this Chapter.

ADVISORY NOTE

An independent airworthiness review may be conducted prior to the granting of an airworthiness approval. The requirement for an airworthiness review is determined on a case-by-case basis by the TAA.

12. Except as provided in 2.1.2.S1.14, airworthiness approval will be granted when it is demonstrated that a proposed type design for an aeronautical product meets all of the requirements listed in the Certification Basis, and results in a TAA-approved type design. The TAA-approved type design for an aeronautical product includes:

a. the drawings and specifications, and a listing of those drawings and specifications that are necessary to define the design features and approved configurations of an aeronautical product in compliance with the requirements listed in the Certification Basis;

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b. the information on dimensions, materials and manufacturing processes that is necessary to manufacture and maintain aeronautical products in conformance with the approved type design;

c. the ICA as specified in 2.1.2.R4;

d. the approved sections of the flight manual or operating instructions, as defined in 2.1.2.R5; and

e. any other data necessary to allow the determination of the airworthiness characteristics of the aeronautical product type design.

13. If the function and reliability tests, as required in 2.1.2.R7, have not been completed, airworthiness approval may still be granted for the proposed type design if:

a. sufficient tests have been completed in the opinion of the TAA to demonstrate safe operation; and

b. a TAA-approved plan exists to ensure completion of the tests prior to TAC, in accordance with Part 2, Chapter 3.

ADVISORY NOTE

Operation of a prototype aeronautical product during development of the type design may in some cases be used to fulfill a portion of the function and reliability tests, if approved by the TAA.

14. Where a proposed type design does not meet all of the requirements listed in the Certification Basis, provisional airworthiness approval may be granted if the applicant demonstrates that:

a. the temporary non-compliance would not degrade the safe operation of the aeronautical product; and/or

b. the non-compliance is compensated for by appropriate operating limitations.

ADVISORY NOTES

1. *Provisional airworthiness approval normally requires:*

   a. *demonstration by the applicant that the proposed type design has been designed, in accordance with and substantially complies with the Certification Basis;*

   b. *that no feature, characteristic or condition makes the aeronautical product type design unsafe when operated within any operating limitations deemed necessary by the TAA;*

   c. *the portions of the ICA deemed necessary by the TAA have been submitted and approved by the TAA; and*

   d. *a flight manual, containing the operating limitations, referred to 2.1.2.S1.14, has been submitted and approved by the TAA.*

2. *The TAA's assessment of the features, characteristics, and conditions is based on experience accumulated with similar type designs, the results of ground tests or flight tests and the identified potential hazards and mitigating measures including plans for rectifying any deficiencies.*

15. Airworthiness Approval in support of a UAS Restricted Type Certificate (RTC) is based on an Airworthiness Impact Assessment (AWIA), which must include the following:

a. system design description;

b. Functional Hazard Analysis (FHA) and System Safety Assessment (SSA);

c. Reliability Summary, which includes the Unmanned Aircraft (UA) reliability, any technical airworthiness issues and the actions taken to resolve those issues;

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d. the established safety record of the UAS; and

e. identification of residual risk for each hazard.

2.1.2.R2 Certification Plan

1. An applicant shall prepare and submit to the TAA for approval a Certification Plan in the form and manner specified in 2.1.2.S2.

ADVISORY NOTES

1. *The Certification Plan is considered the application for airworthiness approval of a proposed Type Design. The date of submission of a Certification Plan is taken as the date of application for airworthiness approval.*

2. A Certification Plan is not required in support of a UAS RTC. The Compliance Program plan can be documented in the Technical Airworthiness Clearance (TAC) Plan.

2.1.2.S2 Certification Plan

1. The Certification Plan shall address the proposed management and process aspects of the intended certification program leading to TAA airworthiness approval of the proposed type design. The Certification Plan shall:

a. outline the purpose, scope, constraints and assumptions, and the applicable definitions for the Certification Program;

b. describe the proposed aeronautical product type design including:

(1) the intended operating environment and usage;

(2) the type of aeronautical product; and

(3) general design details, such as principal design features, operating characteristics and limitations.

c. describe the process for the development of the Certification Basis and submission to the TAA including:

(1) the selection of the applicable airworthiness, noise, and environmental standards, in accordance with 2.1.2.S1;

(2) the identification of areas where the potential exists for a request for a TAA exemption or deviation, in accordance with 2.1.2.S3.3;

(3) the identification of areas where the need for special conditions are anticipated, in accordance with 2.1.2.S3.1.d;

(4) the identification of areas where a finding of equivalent safety by the TAA, as described in 2.1.2.S1.7, may be necessary; and/or

(5) the identification of areas where credit for previous type certification by other airworthiness regulatory agencies is intended to be claimed.

d. outline the proposed certification program including major activities, responsibilities (TAA, PMO or WSM, contractor, and/or other), organizational relationships and schedule;

e. describe the compliance program including the means to be used for demonstrating and recording compliance, the process for obtaining TAA airworthiness authority assignments to enable personnel to make findings of compliance on behalf of the TAA and the proposed methods for tracking compliance progress;

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f. describe the process for the development and submission of the required airworthiness documentation, as described in 2.1.2.S1.10; and

g. describe the production quality process, conformity inspection procedures and the process for obtaining TAA airworthiness authority assignments to enable personnel to make product conformance certifications on behalf of the TAA, in accordance with Part 5, Chapter 4.

ADVISORY NOTES

1. *Product conformance is a technical airworthiness function, as described in 1.4.1.2.3 and performed by an authorized individual on behalf of the TAA. Product conformance is required, in accordance with Part 5, Chapter 4, after the manufacture of an aeronautical product or a part intended for installation on an aeronautical product to certify that it is in conformance with the applicable approved type design. A product conformance certification for a new or upgraded aircraft is required prior to the granting of flight authority, in accordance with Part 5, Chapter 7. The Certificate of Conformance (CofC) is one of the requirements for the issue of a Certificate of Airworthiness (CofA).*

2. *The TAA, upon receipt of a Certification Plan, may decide to form a Design Certification Board (DCB) to assist in the airworthiness approval of a proposed type design. This would normally be the case for the type certification of a new aeronautical product or the design change certification of an extensive design change to an existing approved type design. The purpose of the DCB is to bring the relevant specialists and managers together to coordinate and review certification activities and submitted airworthiness documentation with the view of making a recommendation to the TAA for airworthiness approval of the proposed type design.*

3. *TAA approval of a Certification Plan provides approval-in-principle of the compliance matrix including the proposed means of compliance and the finding authorities, as discussed in 2.1.2.S1.6.b.*

2.1.2.R3 Certification Basis for the Airworthiness Approval of a Type Design

1. The Certification Basis as specified in 2.1.2.S3, shall be submitted to the TAA for approval.

2.1.2.S3 Certification Basis for the Airworthiness Approval of a Type Design

1. Subject to 2.1.2.S3.2 and 2.1.2.S3.3, the Certification Basis for a proposed type design of an aeronautical product is:

a. the applicable standards of airworthiness for the type of aeronautical product that were effective on the date of application for the airworthiness approval;

b. the applicable noise, fuel venting and engine emission standards that were effective on the date of the granting of airworthiness approval for the proposed type design;

c. the appropriate paragraphs of this chapter; and

d. any special conditions including additional standards of airworthiness specified by the TAA as necessary to ensure that an adequate level of safety is achieved for the proposed type design.

2. An applicant may, with the approval of the TAA, elect to include any later amendments to the standards of airworthiness specified in 2.1.2.S3.1, that are made after the date of application, in accordance with that paragraph on condition that any related amendments are also included.

3. The TAA may, upon request by an applicant, grant an exemption or deviation to the applicable standards of airworthiness, in accordance with the *Aeronautics Act*, Section 5.9.

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ADVISORY NOTES

1. *Normally, an exemption or deviation is only granted by the TAA when it is demonstrated that the exemption or deviation:*

   a. *would not degrade the safe operation of the aeronautical product type;*

   b. *is justified in a manner acceptable to the TAA; and*

   c. *is in the interest of DND and the public.*

2. *The date of application is normally taken as the date of submission of the Certification Plan to the TAA, in accordance with 2.1.2.S1.5.*

3. *The date of airworthiness approval is normally taken as the date of issue of the Type Certificate, in accordance with 2.1.2.R8.*

4. *Although the noise, fuel venting, and engine emission standards are environmental rather than aviation safety-related standards, they are considered airworthiness standards for the purposes of type certification of an aeronautical product type design.*

5. *The applicable standards of airworthiness, exemptions, deviations, findings of equivalent safety, appropriate paragraphs of this chapter and special conditions collectively define the complete Certification Basis for the approved type design of an aeronautical product.*

4. The applicable standards of airworthiness for the Certification Basis to be used in the airworthiness approval of a type design shall be selected as follows:

   a. the applicable chapters of the Airworthiness Design Standards Manual (ADSM) for the particular aeronautical product type; and/or

   b. proposed standard(s) where:

      (1) chapters of the ADSM do not apply to the aeronautical product type or an associated system;

      (2) the type design incorporates novel or unusual design features; and/or

      (3) the proposed standard provides a level of safety equivalent to the standards in the ADSM for similar aeronautical product types or systems.

2.1.2.R4 Instructions for Continued Airworthiness (ICA)

1. An applicant for airworthiness approval of a proposed type design shall prepare and submit to the TAA for approval, ICA, as specified in 2.1.2.S4.1.

2. An applicant for airworthiness approval of a proposed type design shall prepare and submit to the TAA, the ICA development / supporting documentation, specified in 2.1.2.S4.2.

2.1.2.S4 Instructions for Continued Airworthiness (ICA)

ADVISORY NOTE

Most civil airworthiness regulatory authorities include ICA as a requirement in their published airworthiness standards for the various aircraft types. For example, refer to Section 529.1529 of the Transport Canada Airworthiness Manual for the ICA required for a transport category rotorcraft. Therefore, if a proposed Certification Basis is based on a civil aircraft type, an applicant should consult with the TAA regarding the applicable standards of airworthiness to use in preparing the ICA.

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1. An applicant for airworthiness approval of a proposed type design shall prepare and submit to the TAA, the ICA as follows;

a. **Airworthiness Limitations (AWL).** The AWLs portion of the ICA as detailed in 5.3.2.S1.1.a(1) shall be prepared and submitted to the TAA for airworthiness approval; and

b. **ICA.** Except for the AWL as required by 2.1.2.S4.1.a, the remainder of the ICA as detailed in 5.3.2.S1.1 shall be prepared and submitted to the TAA for review and acceptance;

ADVISORY NOTE

If the ICA as required by 2.1.2.S4.1.b, have not been completed, airworthiness approval for the proposed type design may still be granted if:

a. *the AWLs as specified in 2.1.2.S4.1.a, are TAA-approved; and*

b. *the plan to ensure the completion of all ICA, specified in 2.1.2.S4.1.b, prior to the delivery of the first aeronautical product or the granting of the first flight authority, whichever occurs later is incorporated into the in-service support plan, required by 2.1.2.R6.*

2. An applicant for airworthiness approval of a proposed type design shall prepare and submit the following additional information in support of the TAA ICA review;

a. The applicant must show that the ICA have been validated;

b. The applicant must describe how the ICA will be captured and practically arranged into a suite of maintenance manuals and the chosen format for the manuals must meet a standard acceptable to the TAA. The Airworthiness Limitations must be segregated and clearly distinguishable from the rest of the information. The Airworthiness Limitations must also have a legible TAA approval statement;

ADVISORY NOTE

Some examples of maintenance manual formats considered acceptable to the TAA are ATA Spec 2200 (formerly ATA Spec 100) or DND approved formats, such as those specified in D-01-100-204/SF-000 (Preparation of Preventive Maintenance Instructions) and D-01-100- 205/ SF-000 (Preparation of Corrective Maintenance Instructions).

c. Upon request, the applicant must provide access to the primary source documentation used to support development of the ICA (for example, Maintenance Review Board, Fault Tree Analysis, FMECA etc.); and

d. The Maintenance Concept shall be described, in accordance with 2.3.2.S1.4.

ADVISORY NOTE

The maintenance concept document describes how the ICA will be captured and managed within an approved maintenance program that satisfies the requirements listed in the Statement of Operating Intent (for example, roles, missions, environment of operation, usage spectrum and annual flying rates). It identifies the goals, levels, structure and periodicities for preventive and corrective maintenance, including the means by which scheduled maintenance requirements are monitored and initiated (that is, life-limited components).

2.1.2.R5 Flight Manual

1. An applicant shall submit to the TAA for approval a flight manual as described and specified in Part 2, Chapter 7.

ADVISORY NOTE

Part 2, Chapter 7 introduces the concept of Technical Airworthiness Data (TAWD). TAWD is that portion of the information and data contained in the aircraft Type Record that is required by a trained

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and current crew to safely operate the aircraft throughout its approved envelope. An applicant for an aircraft Type Certificate must submit to the TAA for approval a Flight Manual that contains this TAWD.

2.1.2.R6 In-service Support Plan

1. An applicant for airworthiness approval of a proposed type design shall prepare and submit to the TAA for approval a plan, in accordance with 2.1.2.S6, to address the continuing compliance of the approved type design during in-service usage.

2.1.2.S6 In-service Support Plan

1. The Plan shall provide information required to enable the TAA to assess the preparations for the continuing compliance of the approved type design after the DND Type Certificate has been issued. Continuing compliance of the approved type design is essential for the assurance of the continuing airworthiness of aeronautical products during operational service. The plan shall also describe the concepts, proposals and/or details regarding the future management of the approved type design for the aeronautical product including:

a. the proposed organization designated as the TCH for the approved type design;

b. the details of the support arrangement between the Design Authority and the TCH, including future communication with the Original Equipment Manufacturer (OEM) for the aeronautical product regarding type design issues including;

(1) service difficulties experienced by other users of the aeronautical product;

(2) service bulletins or equivalents issued by the OEM; and

(3) Airworthiness Directives or equivalent documents issued by other airworthiness regulatory authorities.

c. the assignment of Type Certificate Holder responsibilities, as described in 2.1.2.S8.4;

d. the plan for the development, review and/or approval of any outstanding airworthiness documentation requirements, as discussed in 2.1.2.S1.10, and specifically any outstanding ICA as required by 2.1.2.S4.1.b; and

e. the plan for the development of the maintenance program, in accordance with Part 5, Chapter 3.

2.1.2.R7 Function and Reliability Tests

1. An applicant shall conduct function and reliability tests for airworthiness approval of a type design for an aeronautical product as specified in 2.1.2.S7.

2.1.2.S7 Function and Reliability Tests

1. The function and reliability testing shall be conducted using a representative aeronautical product to demonstrate compliance with:

a. the applicable standards of airworthiness for the aeronautical product type; and

b. the TAA-specified Canadian unique requirements including:

(1) environmental operating conditions;

(2) summer and winter aviation life support equipment (ALSE) compatibility with the type design;

(3) cockpit conditions with particular reference to safe egress and/or ejection from the aircraft; and

(4) crew survival post egress and/or ejection.

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ADVISORY NOTES

1. *The temperature and weather extremes encountered in Canada impose severe demands on both the aircraft type design and the associated ALSE intended to be used during operations. ALSE compatibility is a particularly significant area that must be demonstrated to the satisfaction of the TAA during the function and reliability test program to enable the TAA to grant airworthiness approval.*

2. *The function and reliability program is not defined in terms of flying hours since the complexity of the aircraft type design and the associated ALSE will determine the extent of the testing required. However, the program should provide an adequate representation of the intended operating environment for the aircraft.*

2.1.2.R8 Issuance of a DND Type Certificate

1. The TAA shall issue to a designated Type Certificate Holder a DND Type Certificate for an aeronautical product type design, which has been granted airworthiness approval, in accordance with 2.1.2.S1.12 or 2.1.2.S1.14.

2. The TAA shall issue to a designated Type Certificate Holder a provisional DND Type Certificate for the aeronautical product type design if the type design has been granted provisional airworthiness approval, in accordance with 2.1.2.S1.14.

3. The TAA may issue, to a designated Type Certificate Holder, a DND Restricted Type Certificate for an Unmanned Aircraft System that has been granted airworthiness approval, in accordance with 2.1.2.S1.15.

2.1.2.S8 Issuance of a DND Type Certificate

1. A DND Type Certificate, as specified in Annex B, or a DND Provisional Type Certificate, as specified in Annex C, or a UAS Restricted Type Certificate, as specified in Annex D, shall be issued by the TAA to a designated Type Certificate Holder as the means to record the airworthiness approval of a type design.

2. A Type Certificate Data Sheet (TCDS) shall be attached to the DND Type Certificate and shall contain the following information:

   a. model and type designation;

   b. engine model and type;

   c. propeller model and type;

   d. serial numbers eligible;

   e. approved configurations;

   f. SOI reference;

   g. Certification Basis, including:

      (1) applicable airworthiness code;

      (2) Canadian-unique airworthiness standards;

      (3) special conditions;

      (4) all exemptions or deviations from the Certification Basis; and

      (5) applicable noise and emission standards.

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h. design operating limitations, including:

(1) fuel (military and civilian specification, reference the publication where this information is located);

(2) oil (military and civilian specification, reference the publication where this information is located);

(3) airspeed limits;

(4) maximum weights (taxi, maximum take-off weight (MTOW), landing, zero fuel);

(5) centre of gravity limits, datum and levelling means;

(6) minimum crew;

(7) maximum occupants (includes crew);

(8) fuel capacity;

(9) maximum operating altitude;

(10) outside air temperature limits;

(11) if applicable, ejection seat limits, including:

(a) maximum and minimum boarding weights; and

(b) maximum and minimum nude weights.

(12) life-limited components (reference the publication where this information is provided).

i. approved publications:

(1) Instructions for Continued Airworthiness (ICA) reference;

(2) flight manual and/or operating instructions reference;

(3) if applicable the Master Minimum Equipment List (MMEL) and Minimum Equipment List (MEL) reference;

(4) Aircraft Structural Integrity Management Plan (ASIMP) reference; and

(5) Engine Structural Integrity Management Plan (ESIMP) reference.

ADVISORY NOTE

For a UAS for which a Restricted Type Certificate was issued, a Restricted Type Certificate Data Sheet (RTCDS) is attached to the DND Restricted Type Certificate which contains the information listed in paragraph 2 above, with the exception of paragraph g.

3. A Restricted Type Certificate Data Sheet (RTCDS) shall be attached to the UAS Restricted Type Certificate and shall contain the following information:

a. model and type designation;

b. engine model and type;

c. propeller model and type;

d. eligible serial numbers;

e. approved configurations (including software loads);

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f. SOI reference;

g. design information, including:

(1) all applicable design or airworthiness standards, including any special conditions as a result of a new or novel design feature; and

(2) any equivalent safety items;

h.

(1) fuel (military and civilian specification);

(2) oil (military and civilian specification);

(3) airspeed limits;

(4) maximum weights (taxi, maximum take-off weight (MTOW), landing, zero fuel);

(5) centre of gravity limits, datum and levelling means;

(6) minimum crew;

(7) fuel capacity;

(8) maximum operating altitude;

(9) outside air temperature limits; and

(10) placards;

i. maintenance requirements:

(1) a listing of all life-limited components;

(2) Certification Maintenance Requirements, that is, those maintenance requirements that are mandatory inspection tasks, which are designed to detect latent failures that would result in a hazardous or catastrophic event, if occurring in combination with one or more other specific events; and

(3) structural integrity/damage tolerance inspections.

j. approved publications:

(1) Instructions for Continuing Airworthiness (ICA); and

(2) Flight Manual and/or operating instructions.

4. **Type Certificate Holder Responsibilities.** The responsibilities associated with the role of Type Certificate Holder (TCH) for the approved type design of an aeronautical product are as follows:

a. ensure the establishment, maintenance and availability to the TAA of a Type Record and Technical Record, as specified in Part 5, Chapter 5;

b. monitor aeronautical products in-service and report airworthiness-related issues to the TAA, as specified in Part 3, Chapter 4;

c. ensure that the rectifications of the unsafe conditions and/or type design capability enhancements are accomplished through the implementation of the appropriate design change, as defined in Part 3, Chapter 2 and Part 5, Chapter 3, including changes to MEL/MMEL, as defined in Part 2, Chapter 6, and changes to AOI;

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d. report and staff for the TAA approval any amendments to the data shown in the Type Certificate Data Sheet, as defined in 2.1.2.S8.2;

e. manage airworthiness risks identified during the operational service of the type design, as specified in Part 5, Chapter 1;

f. ensure that the configuration management of the type design is established and maintained in accordance with Part 3, Chapter 3;

g. establish and maintain the arrangements with the TAA-Acceptable Organizations providing the required engineering, logistic and maintenance support to maintain the airworthiness of the type design.

ADVISORY NOTES

1. *The TCH should identify the airworthiness activities required to address the specified TCH responsibilities. All identified activities should be carried out continuously by the TCH or supporting organizations. Although some of these activities could be performed by the supporting organizations only, the TCH remains directly accountable to the TAA for the technical airworthiness of the type design and should stay engaged in the oversight of the outcome of the supporting organizations' activities.*

2. *Some of the activities addressing the TCH responsibilities are normally not assigned to supporting organizations. Examples of such activities are:*

   a. *Technical Airworthiness Approval of risk management documents when the risk index is above the acceptable level of safety (Low or higher);*

   b. *performing Technical Airworthiness Clearance for design changes that result in an aircraft configuration change; and*

   c. *the communication with Operational Airworthiness Authority (OAA) staff, when OAA input is required.*

3. *TCH responsibilities are fully applicable to all DND fleets, whether a DND Type Certificate has been issued or the fleet is flying under a civilian type certificate. The TCH for fleets without a DND Type Certificate is appointed in accordance with paragraph 1.3.1.6.1.b*

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ANNEX A

STATEMENT OF OPERATING INTENT (SOI)

1. Pursuant to 2.1.2.S1, an SOI shall be prepared at the commencement of the Type Certification process. The SOI is developed by the intended operators of the aircraft and approved by the OAA prior to submission to the TAA. In general, the SOI identifies the intended roles, missions, tasks and usage of an aircraft type in sufficient detail to permit the engineering analysis and assessment of the proposed type design and allow selection of appropriate airworthiness standards. It should be noted that the operating environment and specific usage of an aircraft are fundamental to establishing and maintaining airworthiness. To assure continuing airworthiness, the SOI must be maintained and revised as necessary throughout the service life of the aircraft to reflect any changes to the roles, missions, tasks, operational usage and/or environment.

ADVISORY NOTE

The content of an SOI is provided below, although the SOI may be amended and/or expanded as necessary to adequately cover a particular aircraft type. Much of the information required within an SOI resembles that found in Sections 2 and 3 of a Statement of Operational Requirement (SOR). The difference between an SOI and an SOR is that an SOR is typically developed at the commencement of an acquisition project and is a static document that is not maintained or updated, whereas an SOI must be updated throughout the service life of the aircraft type. Given the similarity of the information required in both documents, an applicant may elect one of two options when providing the SOI. The applicant may elect to compile the SOI as a stand-alone document taking information from the SOR as required. Alternatively, the applicant may choose to use the SOR as the SOI, provided the SOR contains sufficient information and that there is a commitment to revise and maintain the document throughout the service life of the aircraft type.

2. The information within an SOI shall include, but is not limited to, the following:

a. **Introduction.** Information to orient the reader and provide a better understanding of the remainder of the SOI, including:

(1) **Background.** Summarizes any pertinent history of the aircraft type, in particular any decisions and/or policy that lead to a revision of the SOI;

(2) **Description.** Provides a brief description of the aircraft type, highlighting major features/systems and any unique features or characteristics, and includes a reference to documents where more comprehensive descriptions can be found;

(3) **Constraints.** Summarizes any constraints or conditions unique to the aircraft type that may significantly influence the airworthiness of the type design or in-service products such as contracted maintenance or the requirement to maintain approved type design in conformance with a civil Type Certificate;

(4) **Related Projects.** Briefly discusses any ongoing or potential projects likely to impact the airworthiness of the aircraft type;

(5) **Responsibilities.** Identifies individuals responsible for reviewing, maintaining or amending and approving of the SOI; and

(6) **Definitions.** Provides definitions of any unique terms, abbreviations or acronyms.

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b. **System Operation.** Information describing how the aircraft type will be used, by whom and under what operational conditions, including:

(1) **Roles, Missions, Tasks and Operational Scenarios.** Summarizes the types of missions such as search and rescue, training, and anti-submarine warfare and how the aircraft type must perform. Note that the specific missions and tasks must fall out of the assigned roles. Descriptive operational scenarios may be used to fully illustrate the operational usage, environmental conditions and threat environment for the intended operational use;

(2) **Concept of Operations.** Provides an outline of how the aircraft type will be used within the context of the previously described roles, missions and tasks. This should include, but is not limited to, any critical interoperability requirements, such as shipborne operations, physical equipment integration and major operator- aircraft interface requirements necessary;

(3) **Environment.** Describes specifically the range of environmental conditions that may be encountered during the above-described roles, missions and tasks. These factors shall include, but are not limited to, temperature range, lighting, noise, vibration, humidity, precipitation, sea spray, and electromagnetic environment (EME), including electromagnetic compatibility (EMC), electromagnetic interference (EMI) and high intensity radio frequency (HIRF);

ADVISORY NOTE

One useful reference that provides a list and description of possible environmental conditions is RTCADO-160D (or later amendment).

(4) **Crew Key Roles.** Provides a brief general description of crew composition and responsibilities;

(5) **Crew Key Tasks.** Provides a comprehensive description of the actual work to be performed by each crew member during the roles, missions and tasks detailed above. Obviously there are a multitude of tasks to be conducted, but this section should focus on only the critical tasks to ensure mission completion;

(6) **User Characteristics.** Provides details regarding the "typical" user, in terms of, for example, anthropometrics, training and experience;

ADVISORY NOTE

This Section may be combined with "Key Roles" and may include a description of specialized equipment that the user must wear or use, such as Aviation Life Support Equipment (ALSE), that may affect the type design.

(7) **Crew Station Interface.** Describes any unique design requirements or novel crew interface characteristics or considerations;

(8) **Configuration.** Describes the various configurations for particular missions or tasks; and

(9) **Usage Spectrum.** Describes in detail the flight conditions and manoeuvres, including frequency of occurrence, severity, mission profile diagrams, and flying rates for each mission and/or configuration.

c. **Systems.** Information describing the systems included in the approved type design and their intended usage to allow selection of relevant and appropriate standards for the type certification process. The specific systems to be addressed will vary depending upon the complexity of the type design and the intended use, and shall include, as applicable, the following:

(1) aircraft management systems and software, including indicating/warning/ recording sub-systems;

(2) navigation system(s);

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(3) communication system(s);

(4) automatic flight control system, including various modes of operation;

(5) surveillance systems (i.e., radar, identification friend or foe (IFF));

(6) engine and engine control systems;

(7) electro-optical systems, such as night vision goggles (NVG) and forward looking infrared radar (FLIR);

(8) lighting systems;

(9) crew egress systems;

(10) environmental systems, including air conditioning, heating, avionics cooling and oxygen;

(11) mission equipment; and

(12) crew survival systems and clothing compatibility with the aircraft.

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ANNEX B

DEPARTMENT OF NATIONAL DEFENCE TECHNICAL AIRWORTHINESS AUTHORITY - TYPE CERTIFICATE

NUMBER _____

This certificate certifies that the type design specified herein meets the requirements for airworthiness approval as described in the Technical Airworthiness Manual, Part 2, Chapter 1, with the design operating limitations, airworthiness limitations and approved publications listed in the Type Certificate Data Sheet.

Unless surrendered, suspended or cancelled, this certificate shall remain valid as long as the approved type design remains in compliance with the applicable airworthiness standards listed in the Certification Basis.

Signature _____

Name
Title
Department of National Defence
Technical Airworthiness Authority
Date of Issue: _____

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ANNEX C

DEPARTMENT OF NATIONAL DEFENCE TECHNICAL AIRWORTHINESS AUTHORITY - PROVISIONAL TYPE CERTIFICATE

NUMBER _____

This certificate certifies that the type design specified herein meets the requirements for provisional airworthiness approval as described in the Technical Airworthiness Manual, Part 2, Chapter 1, with the design operating limitations, airworthiness limitations and approved publications listed in the Type Certificate Data Sheet.

Unless surrendered, suspended or cancelled, this certificate shall remain valid;

a. until the certificate expiry date specified herein;

b. as long as the provisionally approved type design remains in compliance with the applicable airworthiness standards listed in the Certification Basis; and

c. the design operating limitations specified herein are implemented.

Design operating limitations:

Certificate expiry date:

Signature _____

Name
Title
Department of National Defence
Technical Airworthiness Authority
Date of Issue: _____

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ANNEX D

DEPARTMENT OF NATIONAL DEFENCE TECHNICAL AIRWORTHINESS AUTHORITY - RESTRICTED TYPE CERTIFICATE

DATE: _____ **NUMBER: _____**

Under the authority granted to the Minister of National Defence by the Aeronautics Act, this Restricted Type Certificate is issued to the CU <number and name> Unmanned Aircraft System (UAS) Weapon System Manager.

This certifies that the

CU<number and name>

UAS meets the requirements for airworthiness approval, as described in the Technical Airworthiness Manual Part 2, Chapter 1, with the design operating limitations, airworthiness limitations and approved publications listed in the CU<number and name> Restricted Type Certificate Data Sheet (RTCDS).

This certificate and the RTCDS, which is a part hereof, shall remain in effect until surrendered, suspended, revoked or otherwise terminated by the Technical Airworthiness Authority of the Department of National Defence

Signature _____

<Rank and Name>
Technical Airworthiness Authority
For the Minister of National Defence

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SECTION 3

ADVISORY MATERIAL

NOTE

In an effort to provide Advisory Material to TAM users as rapidly as possible, all applicable Advisory Material will be published in the form of TAA Advisories, and will be posted on the DTAES websites, which are updated regularly.

2.1.3.1 Type Certification Process

1. Type certification information for the issuance of a UAS Restricted Type Certificate is available in TAA Advisory 2014-02 *Technical Airworthiness Clearance Requirements for UAS – Type Design and Aeronautical Product.*

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PART 2
INITIAL AIRWORTHINESS

CHAPTER 2 - AIRCRAFT REGISTRATION AND MARKING

SECTION 1

INTRODUCTION

2.2.1.1 Background

1. The purpose of this chapter is to provide the rules and standards pertaining to the registration and marking of DND-registered aircraft and Unmanned Aircraft Systems (UAS).

2. The *Aeronautics Act* requires that all aircraft be registered. The purpose of registration is to identify the aircraft and the regulatory organization that has jurisdiction over it.

3. The aircraft registration and marking process consists of the following:

   a. issuing of a type designation to an aircraft type design;

   b. issuing of a registration number to each aircraft;

   c. issuing of a Certificate of Registration for selected aircraft;

   d. ensuring the placement of mandatory aircraft markings to the aircraft finish scheme;

   e. maintaining an accurate Military Aircraft Register; and

   f. ensuring the removal of DND/CAF identifiers when aircraft are disposed of.

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SECTION 2

RULES AND STANDARDS

2.2.2.R1 Type Designation

1. The Director of Technical Airworthiness and Engineering Support (DTAES) shall, upon submission of an application by the intended Type Certificate Holder (TCH) for a proposed aircraft type design for which a DND Type Certificate will be issued, assign a type designation in accordance with 2.2.2.S1, to use for the identification of the aircraft type.

2.2.2.S1 Type Designation

1. An aircraft type designation shall consist of a prefix letter "C", a second letter indicating the primary role of the aircraft and a three-digit numeric code. A suffix letter shall designate a model type, if required.

2. The letters used to indicate the primary role of the aircraft type are as follows:

C - Transport

E - Electronic Support

F - Fighter

H - Helicopter

P - Patrol

T - Trainer

U - Unmanned Aircraft System (UAS)

3. The model suffix letter and successive letters are used to designate base model and other models or versions of the base model aircraft. Examples of this are:

a. CF188A Hornet - single seat model;

b. CF188B Hornet - dual seat model;

c. CP140 Aurora - base model; and

d. CP140A Arcturus - trainer.

Exceptions are the letters "I" and "X" which are not used.

2.2.2.R2 Registration Number

1. The TAA (DTAES staff) shall assign a registration number, in accordance with 2.2.2.S2, to each individual aircraft for which a Type Designation exists.

2.2.2.S2 Registration Number

1. The registration number shall consist of six digits, the first three of which shall be the numeric code used in the aircraft type designation. The last three digits of the registration number shall form the official aircraft call sign and no call sign shall duplicate the call sign of any other DND-registered aircraft.

ADVISORY NOTE

Registration numbers for UAS may consist of seven digits, the first three of which will be the numeric code used in the type designation. In this case, the last four digits will form the official UAS call sign.

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2. The DTAES shall allocate a registration number to each aircraft upon receipt of a request from the Applicant for the DND Type Certificate. The TAA (DTAES staff) will activate the registration number by adding it to the DND Military Aircraft Register.

3. The TCH, as described in 2.1.2.S8, shall maintain a record of the registration numbers assigned and inform the DTAES immediately of any change in status of a particular aircraft. A summary of changes shall be provided in the Annual Aircraft Report submitted to the DTAES in accordance with Part 3, Chapter 4.

2.2.2.R3 Certificate of Registration

1. A Certificate of Registration shall be issued for each aircraft when requested by the Applicant. A single Certificate of Registration may be used for UAS types with large numbers of Unmanned Aircraft (UA).

2.2.2.S3 Certificate of Registration

1. Certain aircraft types may require a Certificate of Registration to be carried in the aircraft. The Applicant shall determine if this requirement exists and request the Certificate from the TAA (DTAES staff).

2.2.2.R4 Aircraft Markings

1. All DND-registered aircraft shall display the identification, registration and safety markings, as specified in 2.2.2.S4.

2.2.2.S4 Aircraft Markings

1. **Identification Markings.** Identification markings, the colours and proportions of which shall be as individually specified in Canadian Forces Technical Order (CFTO) C-05-005-038/AM-000 and DND-approved drawings, shall be displayed on all DND-registered aircraft as follows:

ADVISORY NOTE

Specific details concerning aircraft finish scheme and identification marking colours, minimum sizes and precise placement are found in Canadian Forces Technical Order (CFTO) C-05-005-038/AM-000.

a. The Canadian flag shall be displayed on both sides of the aircraft. For single and multi-engine fixed-wing aircraft and large rotary-wing aircraft, it shall be on the vertical stabilizer. For small rotary-wing aircraft, it shall be suitably placed on the vertical stabilizer, or aft section, when it is not practical to place it on the vertical stabilizer.

b. The Roundel shall be suitably located on the upper surface port side and lower surface starboard side of the wings and on both sides of the fuselage, with the tip of the maple leaf facing towards the leading edge. The Roundel placed on both sides of the fuselage shall contain the acronyms “RCAF”, to the left of the roundel, and “ARC”, to the right side (i.e., RCAF – Roundel – ARC), as per the applicable aircraft drawing. On rotary wing aircraft, the "RCAF - Roundel - ARC" configuration shall be placed on both sides of the fuselage as per the applicable aircraft drawing the Roundel alone shall be placed in a suitable location on the underside of the fuselage with the tip of the maple leaf facing towards the nose of the aircraft.

c. The last three digits (four, for UAS) of the aircraft registration numbers shall be placed on the upper surface starboard side and lower surface port side of the wings, as well as on both sides of the nose, or elsewhere, if the nose location is precluded by lack of space or other reasons. For rotary wing aircraft, the last three digits of the aircraft registration numbers shall be placed on the nose of the aircraft, below the windscreen and anti-glare area. The full registration number shall be applied directly beneath the Canadian flag, or elsewhere on the tail section, if the area beneath the flag is precluded by lack of space or other reasons. The numerals shall be as per 2.2.2.S4.2.

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d. The Canada wordmark, consisting of the word "Canada" which appears in a modified "Baskerville" typeface and has a Canadian flag symbol over the final "a", shall be prominently displayed on both sides of the aircraft, between the nose and the tail of the aircraft, in accordance with applicable aircraft drawing.

e. Unmanned Aircraft (UA) are to meet the same marking requirements as occupied aircraft, however, with the understanding that UA size and design constraints may necessitate reductions in the size and alternate placement of the markings. The applicant must submit for approval drawings for the UA Identification Markings.

2. **Registration Markings.** The full six (seven, for UAS) digits registration number shall be permanently displayed on all aircraft in a distinct manner, such that it is not obscured or able to be confused with any symbol or letter that is not part of the number. The numbers shall be of equal height formed by solid lines that contrast in colour with the background colour of the aircraft. The full registration marking shall be displayed in the following locations:

a. **Fixed Wing Aircraft.** The full registration number shall be displayed on the vertical stabilizer, below the Canadian flag symbol that shall be displayed, as per 2.2.2.S4.1.a.

b. **Rotary Wing Aircraft.** The registration number shall be displayed on the vertical stabilizer or aft section of the aircraft, if possible, below the Canadian flag symbol that shall be displayed as per 2.2.2.S4.1.a.

3. **Safety Markings.** Safety markings shall consist of servicing, maintenance, hazard and emergency markings to highlight any equipment, services or situations deemed a hazard to the aircraft or personnel safety. Safety markings will consist of symbols and text, the colours, dimensions, wording, font style and location of the safety markings shall be as stipulated in CFTO C-05-006-002/AG-001.

ADVISORY NOTE

C-05-006-002/AG-001 specifies the servicing, maintenance, hazard and emergency markings to be used on RCAF aircraft in an effort to facilitate cross servicing by Allied Nations and to promote safety. To that effect, CFTO C-05-006-002/AG-001 is the implementing document for ratified North Atlantic Treaty Organization (NATO) standardization agreements and Air and Space Interoperability Council (ASIC) Air Standards.

2.2.2.R5 Disposal

1. When DND military aircraft are to be removed from the DND register, all DND-related markings, as detailed in 2.2.2.S4 are to be removed.

2.2.2.S5 Disposal

1. When DND-registered aircraft are decommissioned and are either transferred to disposal agencies, sold to commercial contractors or foreign services, or scrapped, the following RCAF identifiers and DND-related markings are to be removed:

a. Canada wordmarks;

b. Roundels;

c. Canadian flags;

d. aircraft registration numbers;

e. all Squadron crests/badges;

f. NATO symbols/designation;

g. Military specifications;

h. Governor General crests;

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i. United Nations;

j. Red Cross; and

k. Multi-National Force.

2. When aircraft are being disposed of as scrap, the aircraft data plate is to be removed and returned to the TAA (DTAES staff).

3. DTAES staff will remove an aircraft from the DND Military Aircraft Register upon notification by the Weapon System Manager of the aircraft being transferred to a disposal agency, sold or scrapped.

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SECTION 3

ADVISORY MATERIAL

NOTE

In an effort to provide Advisory Material to TAM users as rapidly as possible, all applicable Advisory Material will be published in the form of TAA Advisories, and will be posted on the DTAES websites, which are updated regularly. The Advisory Material presented in this section will eventually be converted into a TAA Advisory.

2.2.3.1 Registration

1. The following TAA Advisory is available on the DTAES Intranet and TAA Internet websites: 2013-16 *Certificate of Registration (CofR)*.

2. This advisory provides the following information:

   a. a MS Word-formatted template for the CofR;

   b. instructions for completing the template;

   c. guidance for the approval of the certificate; and

   d. a sample of a completed certificate.

3. Registration and marking information for UAS operating with a Restricted Type Certificate is available on the DTAES Intranet and TAA Internet websites, in TAA Advisory 2014-02 - *Technical Airworthiness Clearance Requirements for UAS — Type Design and Aeronautical Product*.

2.2.3.2 Naming of Aircraft - Popular Name

1. A popular name means a description designation by which the aircraft will be known within the DND. It is the responsibility of the Project Management Office, in conjunction with 1 Canadian Air Division, to name a newly acquired aircraft fleet.

2. The following list contains some of the precepts to consider when deciding on a popular name for a DND aircraft:

   a. Only aircraft that have reached the production stage, or have immediate prospects of being procured, and which have been officially designated will be named.

   b. If acquisition aircraft already have a suitable official and commonly used name, that name will be retained.

   c. The name selected must impart a Canadian connotation.

   d. For the purpose of brevity, the name shall consist of only one word and be selected to conform to the characteristics of the aircraft and its basic mission, rather than the source of the manufacture.

   e. The name should appeal to the imagination without sacrificing dignity and should suggest confidence in the capabilities of the aircraft.

   f. The name must not supplant the designation nor duplicate those approved or in use for other types of equipment.

   g. Previously associated names may be utilized if suitable (i.e., Musketeer - Musketeer II and Harvard - Harvard II).

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h. Each name under consideration shall be checked against a master list of popular names maintained by TAA (DTAES staff). Once a name has been assigned, it will not be changed without the approval of the TAA (DTAES staff).

i. Each basic model will retain the name originally assigned, regardless of its subsequent manufacturer or operational use. All aircraft series within a basic mission and type will retain the one name assigned thereto (i.e., CC130 Hercules).

j. A family of names for future models may be reserved (on request) for the exclusive use of Canadian manufacturers.

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PART 2
INITIAL AIRWORTHINESS

CHAPTER 3 - TECHNICAL AIRWORTHINESS CLEARANCE (TAC)

SECTION 1

INTRODUCTION

2.3.1.1 Purpose

1. The purpose of this chapter is to provide the rules, standards and advisory material associated with the Technical Airworthiness Clearance (TAC) process. The objective of the TAC process is to provide the DND/CAF airworthiness authorities with the assurance that all of the requirements of the Technical Airworthiness Program have been addressed prior to granting Airworthiness Clearance for a new aircraft type and the release to operational service. The TAC process is considered as the "master" process in the technical airworthiness program in that the scope of the TAC encompasses virtually all of the technical airworthiness requirements contained in the TAM.

2. In terms of the certification and introduction to service of a new aircraft type, the issuance of a TAC by the TAA is considered to be the culmination or final step of the Technical Airworthiness Program as it applies to the Release To Service (RTS) of a new aircraft type. The TAC process also has a prominent role throughout the in-service operating life of an aircraft type. All major design changes to a DND-registered aircraft type require that a TAC be issued by a TAA-authorized individual before the modified aircraft type can be released back into operational service. For a design change, the objective of the TAC is to ensure that, not only has a design change approval been properly completed, but that any of the original TAC in-service support or aeronautical product areas that are affected by the design change have been addressed. For example, the individual issuing the TAC must ensure that the required changes to the flight manual, Instructions for Continued Airworthiness, aircraft configuration record, approved parts list and any other required changes have been completed.

3. The TAC also has an important role in the Airworthiness Review Board (ARB) process. The purpose of the annual ARB is to ensure that each aircraft type remains airworthy, which is accomplished by the review of the Airworthiness Clearance for that type. The process used by the ARB to review the Airworthiness Clearance involves examining all of the airworthiness aspects for each aircraft type to verify that requirements to qualify for a TAC and an Operational Airworthiness Clearance (OAC) continue to be met.

4. The approval of a TAC is considered a technical airworthiness function requiring assignment of airworthiness authority from the TAA. Individuals may be assigned technical airworthiness authority to conduct TAC either directly by the TAA or through a TAA-approved process within a TAA-Acceptable Organization.

2.3.1.2 Overview

1. **Airworthiness Clearance.** The TAC is one of the two major components of the Airworthiness Clearance process. Each new aircraft type that is to be operated on the DND registry must have a valid Airworthiness Clearance prior to its RTS. An Airworthiness Clearance is issued by the DND Airworthiness Authority (AA) to declare that the requirements of the airworthiness program have been met and that, from both a technical and operational airworthiness perspective, the aeronautical product is ready to RTS. An RTS is an authorization by the chain-of-command, normally the Chief of the Air Staff (CAS) for a new aircraft type, to enter into operational service.

2. The AA shall approve an Airworthiness Clearance for each aircraft type based upon:

   a. an OAC having been issued by the Operational Airworthiness Authority (OAA);

   b. a TAC having been issued by the Technical Airworthiness Authority (TAA); and

   c. the Airworthiness Review Board (ARB) recommending an Airworthiness Clearance be approved.

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3. An Airworthiness Clearance will also normally be required for an existing aircraft type following the completion of a major upgrade project where the design changes are so extensive as to require a review of the original RTS. The Airworthiness Clearance process and its relationship to the RTS, is illustrated in Figure 2-3-1-1.

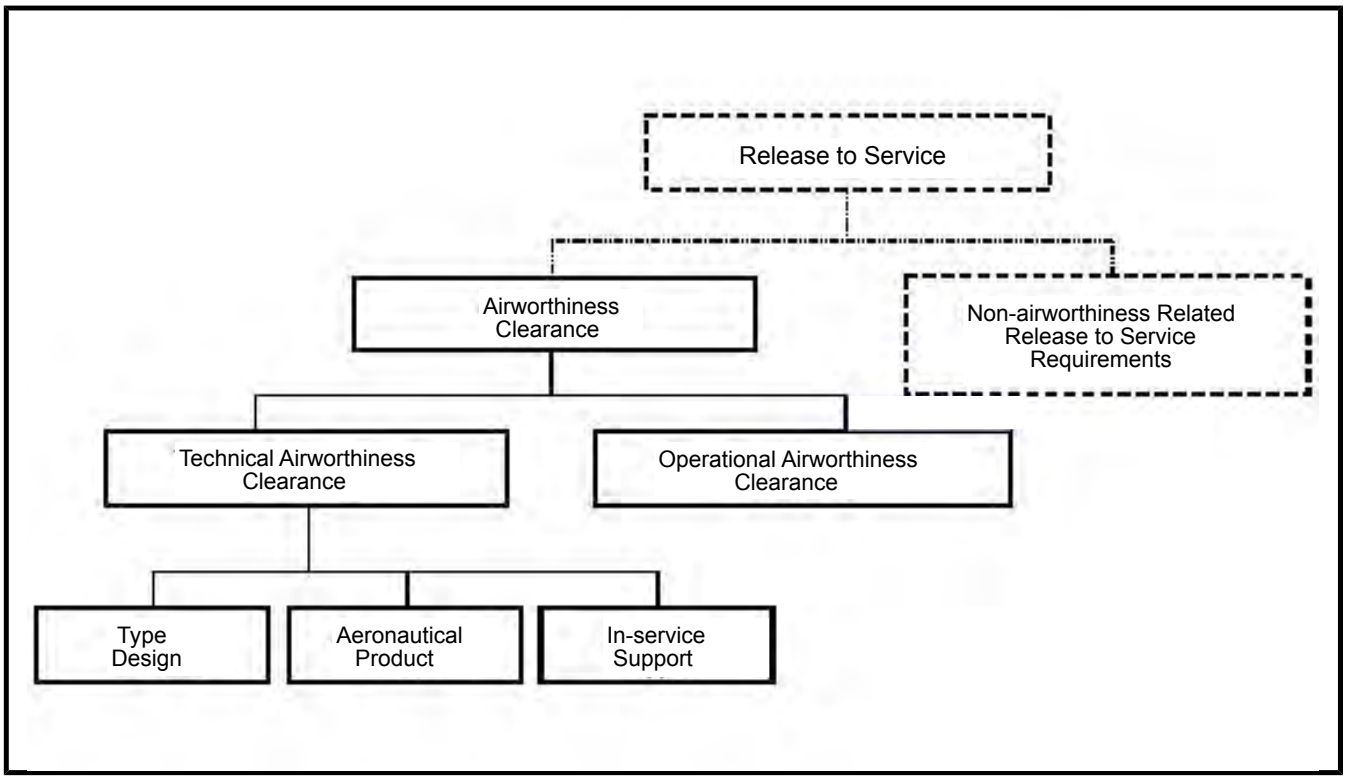

Figure 2-3-1-1 The Technical Airworthiness Clearance (TAC) in Relation to Airworthiness Clearance and Release to Service

4. **Operational Airworthiness Clearance (OAC).** An OAC is issued by the OAA to declare that the operational requirements of the airworthiness program have been met and that, from an operational airworthiness perspective, an aircraft type (or a design change to an aeronautical product) is ready to enter into operational service. An OAC is required before any new aircraft type is permitted to enter into operational service. The requirements that must be satisfied to obtain an OAC are provided in B-GA-104-000/FP-001 *Operational Airworthiness Manual (OAM)*, paragraph 312. As described therein, the OAC addresses operational airworthiness requirements including: operating manuals, training standards, operator training aids, and operational test and evaluation.

5. **Technical Airworthiness Clearance (TAC).** A TAC is issued by the TAA, or an authorized individual, to declare that the technical requirements of the airworthiness program have been met and that, from a technical airworthiness perspective, the aeronautical product (or a major design change to an existing type design) is ready to enter into operational service. A TAC is required before any new aircraft type is permitted to enter into operational service. A TAC is also required for all major design changes to an existing aircraft type prior to release of the aircraft back into operational service. A TAC may be granted when the following Technical Airworthiness Manual (TAM) requirements have been satisfied:

a. **Type Design.** The TAA has granted airworthiness approval to a new aeronautical product type design, in accordance with Part 2, Chapter 1, or an authorized individual has approved a design change to an existing aeronautical product in accordance with Part 3, Chapter 2;

b. **Aeronautical Product.** This portion of the TAC addresses those TAM requirements that are specifically related to an aeronautical product or aircraft fleet. For a new aircraft type, these include the issuing of a Certificate of Airworthiness (CofA) for each aircraft as specified in Part 5, Chapter 7; the aircraft has been added to the DND Military Aircraft Register; and the technical record, including aircraft configuration

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documentation, has been updated to demonstrate fleet conformance to the approved design change, in accordance with Part 5, Chapter 5; and

c. **In-Service Support.** The appropriate in-service support arrangements are in place to ensure the continuing airworthiness of the aircraft type.

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SECTION 2

RULES AND STANDARDS

2.3.2.R1 Technical Airworthiness Clearance (TAC) of a New Aircraft Type

1. All new aircraft / aircraft types that will be operated under the DND Military Aircraft Register must obtain a TAC prior to release into operational service. The TAA shall grant TAC to an aircraft type that meets the requirements specified in 2.3.2.S1.

ADVISORY NOTES

1. *The approval of TAC for a new aircraft type will normally be reserved specifically for the TAA.*
2. *The DND/CAF Airworthiness Program also requires that an OAC be obtained from the OAA before any new aircraft type will be permitted to enter into operational service.*
3. *Other aeronautical products such as Aviation Life Support Equipment (ALSE) or common avionics equipment may also be separately issued a TAC and OAC prior to entry into operational service.*

2.3.2.S1 Technical Airworthiness Clearance (TAC) of a New Aircraft Type

1. The requirements that must be satisfied to issue a TAC for a new aircraft type are defined under the following three subject headings:

a. **Type Design.** The type certification of the type design and all associated requirements identified in 2.3.2.S1.2, must be completed;

b. **Aeronautical Product.** The aeronautical product-related requirements identified in 2.3.2.S1.3, must be completed; and

c. **In-service Support.** Provisions have been made for the establishment of in-service maintenance, engineering and logistics support programs, in accordance with 2.3.2.S1.4.

2. **Type Design.** To obtain a TAC for a new aircraft type, a DND Type Certificate (or a Restricted Type Certificate, for UASs) must have been issued by the TAA to signify the airworthiness approval of the type design. The specific TAM requirements that must be completed are:

a. Aeronautical Product Type Certification Process - Part 2, Chapter 1;

b. Instructions for Continued Airworthiness / Maintenance Program - Part 2, Chapter 1 and Part 5, Chapter 3;

c. Design Change Certification - Part 3, Chapter 2;

d. Flight Manual - Part 2, Chapter 1;

e. Type Record - Part 5, Chapter 5;

f. Type Design Examination - Part 2, Chapter 5; and

g. Master Minimum Equipment List (not mandatory) - Part 2, Chapter 6.

3. **Aeronautical Product.** To obtain a TAC for a new aircraft type, the following TAM requirements related to the aeronautical product must be completed:

a. Certificate of Airworthiness - Part 5, Chapter 7;

b. Certificate of Conformance - Part 5, Chapter 4;

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c. Aircraft Registration and Marking - Part 2, Chapter 2;

d. Aircraft Technical Record - Part 5, Chapter 5;

e. Product Status Documentation - Part 5, Chapter 5;

f. Maintenance Records - Part 5, Chapter 3; and

g. Configuration Status Records - Part 3, Chapter 3.

ADVISORY NOTE

Certificates of Airworthiness will not be issued for UAS operating with a Restricted Type Certificate.

4. **In-service Support Program.** To obtain a TAC for a new aircraft type, an in-service support program acceptable to the TAA, shall be developed and implemented to assure the continuing airworthiness of in-service aeronautical products. The in-service support program shall demonstrate that:

a. Type Certificate Holder (TCH) responsibilities, as defined in 2.1.2.S8.4, have been assigned to a TAA-Acceptable Organization, in accordance with 1.4.2.R1;

b. appropriate communication links have been established between:

(1) DA, TCH and the Original Equipment Manufacturer (OEM), to address airworthiness-related issues, in accordance with 2.1.2.S6.1.b; and

(2) TAA and any other regulatory organizations, if the DND Type Certificate is based on a Type Certificate or similar document, issued by that organization.

ADVISORY NOTE

The communications links between organizations may include the establishment of a service level agreement or Memorandum of Understanding (MOU), for the provision of future support and exchange of information and data relating to the aeronautical product type.

c. assignment of Type Certificate Holder responsibilities as defined in 2.1.2.S8.4, is acceptable to the TAA; and

d. the implementation of the necessary in-service engineering, maintenance and logistics support arrangements shall be acceptable to the TAA by demonstrating compliance to the following:

(1) **Engineering Support Program.** The engineering support program shall demonstrate that:

(a) the organizations that will provide engineering support to the designated TCH have been deemed Acceptable by the TAA, in accordance with 1.4.2.R1;

ADVISORY NOTE

The organizations that provide engineering support to a designated TCH are normally part of a formal Design Support Network (DSN), acceptable to the TAA established as described in 1.3.1.10.

(b) a process acceptable to the TAA has been established for the management of the Type Record for the approved type design, as described in Part 5, Chapter 5;

(c) a process acceptable to the TAA has been established for the control and management of an organizational record, in accordance with Part 5, Chapter 5;

(d) a process acceptable to the TAA has been established to control proposed design changes to the approved type design, including modifications, alterations, maintenance program changes and role, mission and task changes, in accordance with Part 3, Chapter 2;

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(e) a process acceptable to the TAA has been established to control the configuration of in-service aeronautical products, in accordance with Part 3, Chapter 3;

(f) a process acceptable to the TAA has been established for the training, qualification and authorization of personnel within the organization, in accordance with Part 1, Chapter 4 (Annex A of Section 2);

(g) a process acceptable to the TAA has been established for the management of the maintenance program, in accordance with Part 5, Chapter 3;

(h) a process acceptable to the TAA has been established to monitor in-service aeronautical products, in accordance with Part 3, Chapter 4; and

(i) a process acceptable to the TAA has been established for risk management, in accordance with Part 5, Chapter 1.

(2) **Maintenance Support Program.** The maintenance support program shall demonstrate that:

(a) the organizations which will conduct and control maintenance, in accordance with Part 3, Chapter 1 have been deemed Acceptable by the TAA, in accordance with 1.4.2.R1;

(b) the maintenance plan produced during the development of the approved maintenance program in accordance with Part 5, Chapter 3, has been implemented, in a manner acceptable to the TAA;

(c) a process acceptable to the TAA has been established by the TCH for the management of aeronautical product Technical Records, as described in Part 5, Chapter 5, including the procedures for the recording and reporting of maintenance, in accordance with Part 3, Chapter 1; and

(d) a process acceptable to the TAA has been established for the training, qualification and authorization of personnel within the organization, in accordance with Part 1, Chapter 4 (Annex C of Section 2);

(3) **Logistics Support Program.** The logistics support program shall demonstrate that:

(a) the organizations which will provide logistics support have been deemed Acceptable by the TAA, in accordance with 1.4.2.R1;

(b) the airworthiness documentation as defined in 2.1.2.S1.10, necessary to manufacture aviation replacement parts in accordance with Part 5, Chapter 4 and/or the logistic support information necessary to procure aviation replacement parts in accordance with Part 5, Chapter 2, have been delivered to the designated organizations and arrangements acceptable to the TAA have been made for its storage, issue and amendment;

(c) the necessary packaging, handling, storage, shelf life control and transport requirements of aviation replacement parts, as described in Part 5, Chapter 2, have been established; and

(d) a process acceptable to the TAA has been established for the disposal of aviation parts, in accordance with Part 4, Chapter 1.

2.3.2.R2 Provisional Technical Airworthiness Clearance (PTAC) of a New Aircraft Type

1. In some cases, due to operational requirements, it may be necessary to permit the operation of equipment before all technical or operational airworthiness requirements are fully addressed. If necessary, the TAA may issue a provisional TAC (PTAC), until the full TAC requirements are fulfilled. A PTAC may be issued when appropriate measures have been taken to ensure that an acceptable level of safety is provided, including restrictions and/or limitations on the operation of the aircraft and its systems as required.

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2.3.2.S2 Provisional Technical Airworthiness Clearance (PTAC) of a New Aircraft Type

1. The requirements that must be addressed to obtain a PTAC are identical to those listed in the 2.3.2.S1. However, the TAA may issue a PTAC where compliance to all the requirements listed in the standard have not been fully demonstrated provided that an alternate method can be demonstrated to be acceptable to the TAA. The PTAC may be granted when the following conditions have been satisfied:

   a. A Provisional Type Certificate has been issued. A Provisional Type Certificate will normally support only PTAC until such time that a full Type Certificate has been approved. The PTAC shall always include a statement indicating when the full TAC will be granted or the PTAC expires.

   b. It can be demonstrated that any of the incomplete TAC requirements will not present an unacceptable hazard to the in-service operation of the aircraft. A risk assessment may be required to obtain the Operational Commander's acceptance of any residual risk associated with not completing the full TAC requirements.

   c. Any required limitations or restrictions on the operation of the aircraft type have been identified and applied; and

   d. Any required interim or temporary measures have been identified and implemented, including the provision of interim arrangements (engineering, maintenance or logistics support), temporary flight manuals, or temporary maintenance manuals.

2.3.2.R3 Technical Airworthiness Clearance (TAC) of a Design Change

1. All design changes classified as "major" in accordance with 3.2.2.R1 shall receive a TAC prior to the release of the aircraft back into operational service. A TAA authorized individual shall grant a TAC to a design change that meets the requirements specified in 2.3.2.S1.

ADVISORY NOTES

1. *After the TAC for Initial Aircraft Clearance has been granted, all subsequent TACs are normally the responsibility of the TCH, regardless of the design change classification.*

2. *The DND/CAF Airworthiness Program also requires that an Operational Airworthiness Clearance (OAC) for a major design change be obtained from the OAA, prior to release of the aircraft back into operational service.*

2.3.2.S3 Technical Airworthiness Clearance (TAC) of a Design Change

1. The requirements that must be satisfied to issue a TAC for a major design change, are as follows:

   a. **Type Design.** Requires the completion of the design change certification process in accordance with Part 3, Chapter 2. A TAC for a design change shall ensure that any necessary adjustments or changes to the requirements identified in 2.3.2.S1.2, that are affected by the design change to the type design be completed;

   b. **Aeronautical Product.** A TAC for a design change shall ensure that any necessary adjustments or changes to the requirements identified in 2.3.2.S1.3, that are affected by the design change to the type design be completed; and

   c. **In-service Support.** A TAC for a design change shall ensure that any necessary adjustments or changes to the requirements identified in 2.3.2.S1.4, that are affected by the design change to the type design be completed.

2.3.2.R4 Provisional Technical Airworthiness Clearance (PTAC) of a Design Change

1. In some cases, due to operational requirements, it may be necessary to permit the operation of equipment before all technical or operational airworthiness requirements are fully addressed. If necessary, the TCH may require

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that a provisional TAC (PTAC) be granted, until the full TAC requirements are fulfilled. A PTAC may be issued when appropriate measures have been taken to ensure that an acceptable level of safety is provided, including restrictions and/or limitations on the operation of the aircraft and its systems as required.

2.3.2.S4 Provisional Technical Airworthiness Clearance (PTAC) of a Design Change

1. The requirements that must be addressed to obtain a PTAC are identical to those listed in the 2.3.2.S3. However, the TCH may require that a provisional TAC (PTAC) be granted where compliance to all the requirements listed in the standard has not been fully demonstrated, provided that an alternate method can be demonstrated to be acceptable to the TCH. The PTAC may be granted when the following conditions have been satisfied:

a. it can be demonstrated that any of the incomplete TAC requirements will not present an unacceptable hazard to the in-service operation of the aircraft. A risk assessment may be required to obtain the Operational Commander's acceptance of any residual risk associated with not completing the full TAC requirements;

b. the Design Change Certification is complete;

c. any required limitations or restrictions on the operation of the aircraft type have been identified and applied; and

d. any required interim or temporary measures have been identified and implemented, including the provision of interim arrangements (engineering, maintenance or logistics support), temporary flight manuals, or temporary maintenance manuals.

2.3.2.S5 ALSE and Other Equipment - Technical Airworthiness Clearance (TAC)

1. ALSE, including the escape system and other aircraft equipment that is destined for installation in an aircraft, but are not certified as part of an aircraft type shall obtain both a TAC and OAC, prior to release to operational service.

ADVISORY NOTE

The TAC shall address any of the elements in 2.3.2.S1.2 to 2.3.2.S1.4 that are applicable to the equipment in question. The authority to issue a TAC for an item of ALSE equipment is normally assigned to the authorized individual responsible for the specific equipment.

2.3.2.R6 Technical Airworthiness Clearance (TAC) Data Package

1. To obtain a TAC from the TAA, the Applicant shall provide the TAA with a TAC data package, in accordance with 2.3.2.S6.

2.3.2.S6 Technical Airworthiness Clearance (TAC) Data Package

1. The Applicant requesting TAC for a new aircraft type shall submit evidence to demonstrate that compliance with the TAC requirements identified in this chapter have been fulfilled. For new aircraft types requiring TAA approval of the TAC, a data package that provides evidence of compliance shall be submitted to the TAA. Normally, the specific information to be included in the data package will be negotiated between the TAA and the Applicant, and documented in the certification/TAC planning documents.

2. **New Aircraft Type.** To obtain TAA approval of aTAC for a new aircraft type, the TAC data package shall provide documentation to demonstrate that the requirements of 2.3.2.S1 have been completed.

3. **Design Changes.** Where a TAC for a design change is approved by an Authorized Individual in an Acceptable Organization, the TAC data package shall be developed and managed in accordance with the process included in the organization's Engineering Process Manual (EPM). The TAC data package shall provide documentation to demonstrate that the requirements of 2.3.2.S3 have been completed.

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SECTION 3

ADVISORY MATERIAL

NOTE

In an effort to provide Advisory Material to TAM users as rapidly as possible, all applicable Advisory Material will be published in the form of TAA Advisories, and will be posted on the DTAES websites, which are updated regularly. The Advisory Material presented in this section will eventually be converted into a TAA Advisory.

2.3.3.1 Purpose

1. This section sets forth a method of compliance with the requirements of this chapter. This advisory material is for guidance purposes and provides a method of compliance that has been found acceptable to the TAA. The applicant for a TAC may elect to follow an alternate method, provided the alternate method can be demonstrated to be acceptable to the TAA.

2.3.3.2 Technical Airworthiness Clearance (TAC) of a New Aircraft Type

1. The objective of the TAC process is to provide assurance that all of the applicable requirements of the Technical Airworthiness Program have been addressed prior to the release to operational service of a new aircraft type. The Technical Airworthiness Program requirements that apply to obtaining a TAC are identified in the TAM chapters listed in 2.3.2.S1. These requirements have been organized under the following subject areas.

2. **Type Design.** The TAC requirements identified under the type design are predominantly those defined in Part 2, Chapter 1. This area includes requirements for providing evidence that the approved type design has demonstrated compliance with the approved Certification Basis.

3. **Aeronautical Product.** The TAC requirements identified under this heading are predominantly those associated with the individual aircraft in a DND fleet. The requirements include:

a. obtaining a Certificate of Airworthiness for each aircraft in the fleet;

b. entry of each aircraft on the DND aircraft register;

c. ensuring that each aircraft is painted with appropriate DND aircraft marking and identification symbols; and

d. aircraft configuration and maintenance records are available.

4. **In-service Support.** The TAC requirements identified under this section include the technical airworthiness aspects that will constitute the in-service support program for the aircraft type. These requirements address the engineering, maintenance and logistics support arrangements required to maintain the type design and all of the associated aeronautical products. The primary documents that will be developed and approved to address this requirement are the Maintenance Process Manual (MPM) and Engineering Process Manual (EPM) that will be used by the Acceptable Organization supporting the aircraft type.

5. TAC information for UAS operating with a Restricted Type Certificate is available on the TAA internet and DTAES intranet websites, in TAA Advisory 2014-02 – *Technical Airworthiness Clearance Requirements for UAS – Type Design and Aeronautical Product*. In-Service Support information for UAS is available in TAA Advisory 2013-05 – *Continuing Airworthiness Requirements for Uninhabited Air Vehicle Systems*.

2.3.3.3 Technical Airworthiness Clearance (TAC) of a Design Change

1. The TAC process also has a prominent role throughout the in-service operating life of the aircraft fleet. All major design changes to a DND-registered aircraft require that a TAC be issued by an authorized individual before the modified aircraft type can be released back into operational service. For a design change, the objective of the TAC is to ensure that, not only has a design change approval been completed as required in accordance with 3.2.2.R2,

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but that all the other areas affected by the design change have been addressed as well. For example, the individual issuing the TAC must ensure that the required changes to the flight manual, Instructions for Continued Airworthiness, Approved parts list, and any other required changes have been completed. TAC table, Figure 2-3-3-1, showing the work breakdown structure and the checklists, Figures 2-3-3-2 to 2-3-3-4, may be used as the basis against which the design change is reviewed to determine if any of the listed elements have been affected by the design change.

2.3.3.4 Technical Airworthiness Clearance (TAC) - Other Aeronautical Products

1. The TAC process may also be applied where required to provide a technical airworthiness clearance or approval for those aeronautical products or equipment whose design is not subject to the type certification process described in Part 2, Chapter 1. Examples of equipment for which the TAC may be applied include ALSE and avionics systems that will be installed in multiple aircraft types. For these equipments, it would not be expected that all of the TAC requirements would be applicable. Therefore, the TAC requirements described in 2.3.2.S1 and described in the TAC-work breakdown structure would be tailored to meet the appropriate equipment certification and in-service support requirements.

2.3.3.5 Provisional Technical Airworthiness Clearance (PTAC)

1. The TAA or an Authorized Individual may issue a provisional technical airworthiness clearance when the requirements to obtain a full clearance have not been fully satisfied, but where appropriate measures have been taken to ensure that an acceptable level of safety is provided. Appropriate measures may include limitations and restrictions on the operation of the aircraft, risk assessments, or the decisions of a Design Certification Board (DCB).

2.3.3.6 Annual Airworthiness Review Board (ARB) Review of an Airworthiness Clearance

1. The TAC also makes an important contribution to the Airworthiness Review Board (ARB) process. One of the roles of the ARB is to annually review the Airworthiness Clearance for each DND-registered aircraft fleet. The purpose of the annual ARB review is to ensure that each type remains airworthy. The process used by ARB is to examine airworthiness aspects for each fleet to verify that requirements to qualify for a TAC and an Operational Airworthiness Clearance (OAC) continue to be met. One aspect of the ARB review includes assurance that a TAC has been issued for each major design change implemented on the fleet since the previous ARB.

2.3.3.7 Technical Airworthiness Clearance (TAC) Data Package

1. **New Aircraft Type.** The Technical Data Package for a new aircraft type comprises all the documents developed in support of that activity. Specifically, all the certificates issued for the fleet and for each aircraft (Type Certificate (TC), Type Certificate Data Sheet (TCDS), Certificate of Airworthiness (CofA), Certificate of Conformance (CofC) etc.) along with statements of approval or acceptance of the various plans and manuals referred to in 2.3.2.S1 should be available for review by the TAA.

2. **Design Changes.** For design changes, the relevant data package includes all those documents produced or amended in support of the design change process. Acceptable Organizations may utilize their own specific document titles as described in their approved process manual. Only those elements of Figure 2-3-3-1, work breakdown structure that have been amended, altered or changed as a result of the design change need to be included.

2.3.3.8 Technical Airworthiness Clearance (TAC) Work Breakdown Structure and Checklist

1. **TAC Work Breakdown Structure.** TAC table, Figure 2-3-3-1 shows the work breakdown structure. Each element of the work breakdown structure includes a TAM reference pointing to the applicable airworthiness requirements for that element.

2. **TAC Checklist.** A detailed expansion of the work breakdown structure elements is provided in Figure 2-3-3-2 to Figure 2-3-3-4. These tables may be used as a checklist to determine if all applicable elements and components of the TAC have been addressed.

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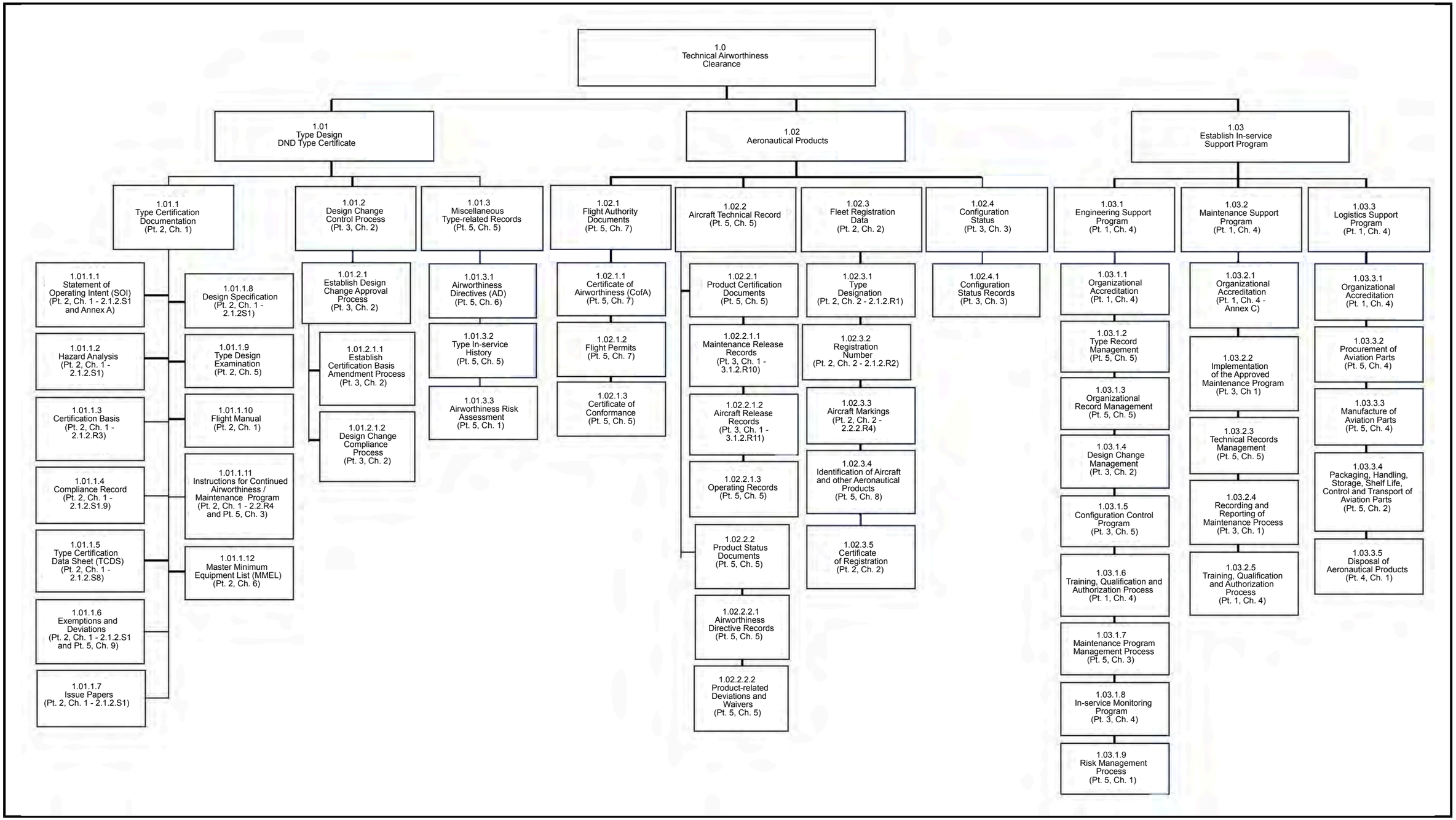

Technical Airworthiness Clearance (TAC) Table Figure 2-3-3-1

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Figure 2-3-3-2 Technical Airworthiness Clearance (TAC) - Section 1.01 - Design - Type Certification

1.01 Type Design - DND Type Certificate				Comments
1.01.1 Type Certification Documentation				
1.01 Type Design DND Type Certificate (Pt. 5, Ch. 5)	**1.01.1 Type Certification Documentation** (Pt. 2, Ch. 1)	**1.01.1.1**	**Statement of Operating Intent (SOI)** (Pt. 2, Ch. 1 - 2.1.2.S1 and Annex A)	The TCDS shall include a reference to the approved SOI document.
		1.01.1.2	**Hazard Analysis** (Pt. 2, Ch. 1 - 2.1.2.S1)	Provide a reference to the approved Hazard Analysis document.
		1.01.1.3	**(Certification Basis)** (Pt. 2, Ch. 1 - 2.1.2.R3)	Provide a reference to the approved Certification Basis document.
		1.01.1.4	**Compliance Record** (Pt. 2, Ch. 1 - 2.1.2.S1.9)	Provide a reference to the approved Compliance Record document.
		1.01.1.5	**Type Certificate Data Sheet (TCDS)** (Pt. 2, Ch. 1 - 2.1.2.S8)	Provide a copy of the Approved Type Certificate and Type Certificate Data Sheet (TCDS).
		1.01.1.6	**Exemptions and Deviations** (Pt. 2, Ch. 1 - 2.1.2.S1 and Pt. 5, Ch. 9)	Identify any exemptions, or deviations to rules and standards.
		1.01.1.7	**Issue Papers** (Pt. 2, Ch. 1 - 2.1.2.S1)	Provide an index list of the issue papers (IP) and their status.
		1.01.1.8	**Design Specification** (Pt. 2, Ch. 1 - 2.1.2.S1)	Provide a reference to the Aircraft Master Design Document (i.e., Top Level Drawing).
		1.01.1.9	**Type Design Examination (TDE)** (Pt. 2, Ch. 5)	If TDE applied during certification program, provide a reference to the TDE findings report.
		1.01.1.10	**Flight Manual** (Pt. 2, Ch. 1)	Identify the TAA approved Flight Manual, including version or revision number.
		1.01.1.11	**Instructions for Continued Airworthiness (ICA) / Maintenance Program** (Pt. 2, Ch. 1 - 2.1.2.R4 and Pt. 5, Ch. 3 - 5.3.2.R1)	Provide a reference to the document containing the approved ICA.
		1.01.1.12	**Master Minimum Equipment List (MMEL)** (Pt. 2, Ch. 6)	Provide a reference to the approved MMEL.
	1.01.2 Design Change Control Process (Pt. 3, Ch. 2)	**1.01.2.1**	**Establish Design Change Approval Process** (Pt. 3, Ch. 2)	Identify the organization responsible for the control of design changes to the type design. Provide a brief description of the process that will be used to manage the certification of in-service design changes, including a description of the Design Support Network (DSN). If the design management processes and procedures are described in an Engineering Procedures Manual (EPM), then it would only be necessary to make reference to the relevant section of the EPM.
		1.01.2.1.1	**Establish Certification Basis Amendment Process** (Pt. 3, Ch. 2)	
		1.01.2.1.2	**Design Change Compliance Process** (Pt. 3, Ch. 2)	
	1.01.3 Miscellaneous Type-related Records (Pt. 5, Ch. 5)	**1.01.3.1**	**Airworthiness Directive (AD)** (Pt. 5, Ch. 6)	Identify any AD issued against this aircraft type.
		1.01.3.2	**Type In–service History** (Pt. 5, Ch. 5)	If this is an existing aircraft type, summarize its Service History.
		1.01.3.3	**Airworthiness Risk Assessments** (Pt. 5, Ch. 1)	List any Risk Assessments conducted.

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1.02 Aeronautical Product				Comments
1.02.1 Flight Authority Documents				
1.02.1 Flight Authority Documents (Pt. 5, Ch. 7)	**1.02.1.1**	**Certificate of Airworthiness (CofA)** (Pt. 5, Ch. 7)		Ensure a CofA is issued for each tail number.
	1.02.1.2	**Flight Permits** (Pt. 5, Ch. 7)		List any Flight Permits issued against this aircraft type.
	1.02.1.3	**Conformance Certificates** (Pt. 5, Ch. 5)		Ensure a CofC has been issued for each tail number.
1.02.2 Aircraft Technical Record				
1.02.2 Aircraft Technical Record (Pt. 5, Ch. 5)	**1.02.2.1 Product Certification Documents** (Pt. 5, Ch. 5)	**1.02.2.1.1**	**Maintenance Release Records** (Pt. 3, Ch. 1 - 3.1.2.R10)	As described in MPM.
		1.02.2.1.2	**Aircraft Release Records** (Pt. 3, Ch. 1 - 3.1.2.R11)	As described in MPM.
		1.02.2.1.3	**Operating Records** (Pt. 5, Ch. 5)	As described in MPM.
	1.02.2.2 Product Certification Documents (Pt. 5, Ch. 5)	**1.02.2.2.1**	**Airworthiness Directive (AD) Records** (Pt. 5, Ch. 5)	Ensure all applicable AD and compliance activities are recorded.
		1.02.2.2.2	**Product–related Deviations and Waivers** (Pt. 5, Ch. 5)	Ensure any deviations or waivers are recorded in applicable technical record.
1.02.3 Fleet Registration Data				
1.02.3 Fleet Registration Data (Pt. 2, Ch. 2)	**1.02.3.1**	**Type Designation** (Pt. 2, Ch. 2 - 2.2.2.R1)		Ensure Type Designation has been provided by the TAA.
	1.02.3.2	**Registration Number** (Pt. 2, Ch. 2 - 2.2.2.R2)		Ensure each tail number has been provided by the TAA.
	1.02.3.3	**Aircraft Markings** (Pt. 2, Ch. 2 - 2.2.2.R4)		Ensure all required CAF markings are applied.
	1.02.3.4	**Identification of Aircraft and Other Aeronautical Products** (Pt. 5, Ch. 8)		
1.02.4 Configuration Status				
1.02.4 Configuration Status (Pt. 3, Ch. 3)	**1.02.4.1**	**Configuration Status Records** (Pt. 3, Ch. 3)		

Figure 2-3-3-3 Technical Airworthiness Clearance (TAC) - Section 1.02 - Aeronautical Product

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1.03 Establish In-service Support Programs		Comments
1.03.1 Engineering Support Program		
1.03.1 Engineering Support Program (Pt. 1, Ch. 4)	1.03.1.1 Organizational Accreditation (Pt. 1, Ch. 4 - 1.4.2A)	Ensure organizations are deemed Acceptable by the TAA.
	1.03.1.2 Type Record Management (Pt. 5, Ch. 5 - 5.5.2.R1)	As described in the Engineering Process Manual (EPM).
	1.03.1.3 Organizational Record Management (Pt. 5, Ch. 5 - 5.5.2.R3)	As described in the EPM.
	1.03.1.4 Design Change Management (Pt. 3, Ch. 2)	As described in the EPM.
	1.03.1.5 Configuration Control Program (Pt. 3, Ch. 3)	As described in the EPM.
	1.03.1.6 Training, Qualification and Authorization Process (Pt. 1, Ch. 4 - 1.4.2A)	As described in the EPM.
	1.03.1.7 Maintenance Program Management Process (Pt. 5, Ch. 3)	As described in the EPM.
	1.03.1.8 In–service Monitoring Program (Pt. 3, Ch. 4)	As described in the EPM.
	1.03.1.9 Risk Management Process (Pt. 5, Ch. 1)	As described in the EPM.
1.03.2 Maintenance Support Program		
1.03.2 Maintenance Support Program (Pt. 1, Ch. 4)	1.03.2.1 Organizational Accreditation (Pt. 1, Ch. 4 - 1.4.2, 1.4.2C)	Ensure organizations are deemed Acceptable by the TAA.
	1.03.2.2 Implementation of the Approved Maintenance Program (Pt. 3, Ch. 1 - 3.1.2.R1)	As described in the Maintenance Process Manual (MPM).
	1.03.2.3 Technical Records Management (Pt. 5, Ch. 5 - 5.5.2.R2)	As described in the MPM.
	1.03.2.4 Recording and Reporting of Maintenance Process (Pt. 3, Ch. 1)	As described in the MPM.
	1.03.2.5 Training, Qualification and Authorization Process (Pt. 1, Ch. 4 - 1.4.2C)	As described in the MPM.
1.03.3 Logistics Support Program		
1.03.3 Logistics Support Program (Pt. 1, Ch. 4)	1.03.3.1 Organizational Accreditation (Pt. 1, Ch. 4)	Ensure organizations are deemed Acceptable by the TAA.
	1.03.3.2 Procurement of Aviation Parts (Pt. 5, Ch. 2 - 5.2.2.R1)	As described in the EPM.
	1.03.3.3 Manufacture of Aviation Parts (Pt. 5, Ch. 4)	As described in the EPM.
	1.03.3.4 Packaging, Handling, Storage, Shelf Life Control and Transport of Aviation Parts (Pt. 5, Ch. 2 - 5.2.2.R2)	As described in the EPM.
	1.03.3.5 Disposal of Aeronautical Products (Pt. 5, Ch. 4)	As described in the EPM.

Figure 2-3-3-4 Technical Airworthiness Clearance (TAC) - Section 1.03 - In-service Support Programs

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PART 2
INITIAL AIRWORTHINESS

CHAPTER 4 - (NOT ALLOCATED)

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PART 2
INITIAL AIRWORTHINESS

CHAPTER 5 - TYPE DESIGN EXAMINATION (TDE)

SECTION 1

INTRODUCTION

2.5.1.1 Purpose

1. The purpose of this chapter is to provide the rules, standards and advisory information related to obtaining credit for certification activities performed by organizations acceptable to the Technical Airworthiness Authority (TAA). The process used to obtain credit is called Type Design Examination (TDE).

2. Individuals who may be authorized to conduct type design examinations and grant credits include the Senior Design Engineer (SDE) in an Acceptable Technical Organization (ATO) or Acceptable Design Organization (ADO). This chapter has been written to provide the information required by:

   a. SDE, and other individuals, who are authorized to perform airworthiness-related activities related to design change certification, which may include the authority to perform TDE and grant credit for certification activities performed by other organizations.

   b. Applicants to the TAA for airworthiness approvals, where the design includes aspects for which the applicant is requesting credit for certification activities performed by other organizations.

3. The TDE process does not grant any airworthiness approvals. This process is to be used to establish the amount of credit that will be given to previous certification work. This credit may be applied, in whole or in part, towards obtaining airworthiness approval. Once the TDE has been successfully completed, the results may be applied towards gaining airworthiness approval, in accordance with Part 3, Chapter 2 or Part 2, Chapter 1.

4. This chapter contains three sections that address the following subjects:

   a. **Section 1 - Introduction.** This section provides an executive summary of the TDE process. This section also contains the TDE process flow chart diagram and a table that describes each step in the process.

   b. **Section 2 - Rules and Standards.** This section provides the rules and standards that apply to TDE and identifies the requirements that must be met to obtain credit.

   c. **Section 3 - Advisory Material.** This section provides advisory and guidance information to assist in meeting the rules and standards identified in Section 2.

2.5.1.2 Background

1. Certifying a new aeronautical product or a major design change requires significant effort by both the applicant and the airworthiness authority. Since DND regularly acquires aeronautical products or adopts design changes that are based on previously certified or qualified designs, much of the work to certify those designs has already been completed by another airworthiness authority or competent design organization.

2. In order to minimize duplication of effort, the TAA is prepared to give maximum credit to certification work performed by other airworthiness authorities and design organizations, provided that the work is acceptable to the TAA. Once credit for previous work has been established, effort can then be concentrated on any remaining certification requirements.

3. The aim of a TDE is to give certification work performed by other organizations the same validity as if the work had been performed by the TAA or by a TAA-Acceptable Organization. However, until the TDE activities have been

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successfully completed, it cannot be automatically assumed that airworthiness approval from other airworthiness authorities are acceptable to the TAA.

4. The TDE process described herein incorporates many of the elements of the validation process used by Transport Canada Civil Aviation (TCCA) to certify foreign designs. However, there are some significant differences between the DND TDE process and the comparable TCCA process. One of the differences is that TCCA has the benefit of bilateral agreements with many of the civil aviation authorities of other nations. These agreements constitute Transport Canada's formal recognition of the acceptability of the certification processes and procedures used by those authorities. Additional information about the TDE process used by TCCA can be found in the references provided in 2.5.3.7.

5. To compensate for the absence of agreements between DND and other airworthiness authorities, the DND TDE process includes an activity called "Assessment of Acceptability". This assessment allows the TAA to become familiar with the standards, processes and procedures used by the other airworthiness authorities.

6. The other significant difference between DND's TDE process and the TCCA process concerns the type of organizations that TCCA will credit. While TCCA will only grant credit for certification activities performed by other civil airworthiness authorities with whom they have bilateral agreements, such as the U.S. Federal Aviation Authority (FAA), the TDE process used by DND expands the definition of the organizations whose work may be acceptable to include foreign military airworthiness authorities, original equipment manufacturers, and competent design organizations.

2.5.1.3 Type Design Examination (TDE) Process

1. The DND TDE process has two main components:

   a. Part 1 - Assessment of Acceptability and Applicability; and

   b. Part 2 - Type Design Review.

2. **Part 1 - Assessment of Acceptability and Applicability.** The first part of the TDE process involves an assessment to establish the extent of Type Design Review to be performed:

   a. **Assessment of Acceptability.** The purpose of the assessment of acceptability is to determine if the standards, processes and procedures used during the original certification program are acceptable to the TAA.

   b. **Assessment of Applicability.** The purpose of the assessment of applicability is to establish that the original design and associated certification work are applicable to a DND registered aeronautical product.

3. **Part 2 - Type Design Review.** The second part of the TDE process is called Type Design Review. The purpose of the Type Design Review is to conduct a review of some or all of the documentation from the original certification program to ensure that it complies with the requirements of the DND/CAF Technical Airworthiness Program. The results from the review will be used to determine what credit will be given to the original certification work and to identify any additional certification activities that must be performed to obtain TAA approval.

4. **Level of Review.** The extent of the type design review to be undertaken will be primarily determined from the results from the assessments of acceptability and applicability. Three different levels of review have been established and may be applied, in whole or in part, to the original certification work. Using a risk management approach, the Levels 1 and 2 reviews will examine selected aspects of the original certification work. Review Level 3 will be applied where a more detailed evaluation of the design is required. The following are the three levels of review:

   a. **Level 1 - Minimum Review.** A Level 1 review would be appropriate when the TAA or an authorized individual is able to give full credit for the original certification work without examining the technical data from the compliance program. This will require that the airworthiness standards that form the Certification Basis, the means and methods used to demonstrate compliance, and the processes for making the original findings of compliance are acceptable to the TAA. A Level 1 review is indicated when the assessments from Part 1 have been successfully completed without identifying any questions,

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problems or issues that need to be resolved. A Level 1 review will include the examination of the information contained in top-level documentation from the original certification program. Examples of this documentation include the original Type Certificate, Supplemental Type Certificate (STC), Type Certificate Data Sheet (TCDS), Approved Flight Manual (AFM), and Master Minimum Equipment List (MMEL).

b. **Level 2 - Limited Review.** A Level 2 review requires the examination of selected aspects of the original certification program. A Level 2 review would normally be performed when the results from the assessments in Part 1 indicate that specific aspects of the compliance program need further examination. The Level 2 review includes the following:

(1) the Level 1 review activities described above; and

(2) a limited examination of the documentation and technical data for selected areas of the original certification program to address any questions or issues arising from the assessments or the Level 1 review. The TAA may also require the specific aspects of the original work be reviewed.

c. **Level 3 - Comprehensive Review.** A Level 3 review is a comprehensive examination of selected aspects of the original certification program to validate the adequacy of the results of the program. The requirement for a Level 3 review will be established based upon the results from the Part 1 assessments and further investigate any issues arising from the Level 2 review. A Level 3 review would be indicated when:

(1) it is not possible to establish the acceptability of the original certification work or the applicability of the original design for incorporation into a DND aeronautical product;

(2) issues arising from the Part 1 assessments could not be satisfactorily resolved during meetings between the applicant and the TAA;

(3) there are significant physical design or operational usage differences between the design that was originally certified and the final version of the design that will be incorporated into a DND-registered aeronautical product; or

(4) the TAA requires that specific aspects of the original work be subjected to a comprehensive review.

2.5.1.4 Use of the Results from the Type Design Examination (TDE)

1. Upon completion of the TDE process, the results may be applied towards obtaining airworthiness approval, as follows:

a. **New Aircraft Type.** In the case of a new type design, the results from the TDE will be included into the certification plan and compliance program, as described in Part 2, Chapter 1.

b. **Design Change to an Existing DND-registered Aeronautical Product.** When considering a design change to an existing DND-registered aeronautical product, the TDE process will identify the credit that can be applied towards obtaining airworthiness approval of the design change as described in Part 3, Chapter 2.

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SECTION 2

RULES AND STANDARDS

2.5.2.R1 Type Design Examination (TDE)

1. The TAA is prepared to give maximum credit to certification activities performed by other organizations, where these activities have been demonstrated to be acceptable to the TAA. To obtain credit, in whole or in part, the certification activities shall meet the requirements of the Type Design Examination process specified in 2.5.2.S1.

ADVISORY NOTE

Type Design Examination may be performed by the TAA or by an authorized individual. The TAA will make assignments of authority for airworthiness activities related to Type Design Examination, as follows:

a. ***Acceptable Organizations.*** *Individuals who are members of a TAA-Acceptable Organization and authorized by the TAA to approve design changes may also be authorized to perform TDE activities. As a component of the individual's airworthiness approval authority, the authority to perform TDE must be included in their TAA-approved Engineering Process Manual (EPM); and*

b. ***Certification Plan.*** *Where the type design or design change certifications are conducted in accordance with a TAA-approved certification plan, the plan may include an assignment of authority for TDE-related activities.*

2. The completion of the TDE process does not in itself grant any airworthiness approvals. The process only establishes the amount of credit that will be given to the previous certification work. Once the TDE has been successfully completed, the results must be applied towards obtaining an airworthiness approval in accordance with Part 3, Chapter 2 or Part 2, Chapter 1.

3. Only the TAA or authorized individuals shall grant credit for certification activities performed by other organizations. However, only the TAA shall grant TDE credit when TDE results are to be applied towards the airworthiness approval of a design change where the magnitude and complexity of the design change meets the criteria of 3.2.2.S1.3, or where the TDE is to be applied towards the type certification of an aeronautical product in accordance with 2.1.2.S1.

2.5.2.S1 Type Design Examination (TDE)

1. Obtaining credit for certification work performed by other organizations requires the completion of a TDE process consisting of two parts:

a. Part 1 - Assessment of Acceptability and Applicability; and

b. Part 2 - Type Design Review.

2. **Part 1 - Acceptability and Applicability.** An assessment of the original design and associated certification work shall be performed as follows:

a. **Assessment of Acceptability.** The standards, processes and procedures used during the original certification program, must be assessed to determine if they are acceptable to the TAA. The assessment shall verify that:

(1) the airworthiness standards and certification requirements identified in the Certification Basis used to certify the original design or design change are acceptable;

(2) the processes, procedures and finding authorities used by the original certification authority are acceptable;

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(3) the system safety assessment that was completed during the original certification activity is acceptable.

(4) the process for defining the required compliance documentation is acceptable and can be used to establish a high degree of confidence in the certification process. This requires that:

(a) the airworthiness standards are clearly identifiable;

(b) the means and methods of compliance are adequately described; and

(c) the proof of compliance documentation clearly establishes that the airworthiness standards have been met.

ADVISORY NOTE

The acceptability of other airworthiness organizations is addressed in the recognition and accreditation portions of Part 1, Chapter 4. For the TDE process the following additional information is provided:

a. ***Design Changes Managed within an ATO/ADO.*** *Where the EPM for an ATO/ADO identifies a DSN with organizations that are deemed Acceptable by the TAA, these organizations may be considered to have satisfied the "Assessment of Acceptability" requirements listed in 2.5.2.S1.2. This is based on the assumption that as a prerequisite to obtaining their accreditation or recognition that a TAA-approved Certification Basis exists and that the associated DSN design change management processes and procedures for the aeronautical product are acceptable to the TAA; and*

b. ***New Type Designs.*** *For new type designs, where the original certifying organization has not been previously recognized or found to be acceptable the TAA, the TDE process will require the TAA to make an assessment of acceptability.*

b. **Assessment of Applicability.** The original design and its associated certification work must be shown to be applicable to the DND-registered aeronautical product for which it is intended. The assessment of applicability must establish the suitability of the design against the intended operational roles and operating environment. The assessment of applicability shall address the following areas:

(1) **Configuration.** The design must be suitable for the configuration of the DND-registered aeronautical product for which it is intended. Any significant design or physical configuration differences between the design that was originally certified and the version of the design that will be incorporated into a DND registered aeronautical product must be addressed during the assessment. The assessment must also identify any proposed additional technical requirements or special conditions required to satisfy Canadian or DND peculiar requirements;

(2) **Role.** The assessment must identify any significant operational usage differences between the design that was originally certified and the version of the design that will be incorporated into a DND aeronautical product. The factors to be considered include the following: flight profiles, usage spectrum, configurations, stores (internal and external), weights, day/night operations, speed and altitude ranges, etc.; and

(3) **Environment.** The assessment must include a comparison of the operating environment that was assumed during the original certification program with the proposed DND operating environment. The environmental factors to be considered include: atmospheric, acoustic, vibration, humidity, corrosion and electromagnetic.

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3. **Part 2 - Type Design Review.** The process that shall be used to examine the results of the original certification work is called Type Design Review. The level of review to be undertaken will be determined based upon the following criteria:

a. the results of the assessment of acceptability conducted under 2.5.2.S1.2.a;

b. the results of the assessment of applicability conducted under 2.5.2.S1.2.b;

c. the complexity of the design;

d. whether there are any novel or unusual features associated with the design; and

e. the in-service history of the design, including the resolution of any service difficulty trouble reports.

4. **Review Levels.** Based on the results of the assessments of acceptability and applicability one or more of the following review levels shall be applied to examine the results from the original certification program:

ADVISORY NOTE

The type design review process has been structured to allow the use, where appropriate, of different levels of review during the examination of the original certification work. Therefore, based on the assessments of acceptability and applicability, portions of the design may only be subjected to a Level 1 review, while other aspects of the design may require a Level 2 or Level 3 review. The intent behind allowing different levels of review is to avoid having to default to the most rigorous level of review in those instances where there are only a few specific aspects that justify a Level 3 review.

a. **Level 1 - Minimal Review.** A Level 1 review shall be applied when the results of the Part 1 assessments indicate that credit may be given to the original certification work without formal examination of the technical data from the compliance program. A Level 1 review is indicated when the following criteria have been satisfied:

(1) another airworthiness authority has approved the design or the certification work has been performed by a TAA-Acceptable Organization;

(2) successful completion of the assessment of acceptability;

(3) successful completion of the assessment of applicability;

(4) the complexity of the design or design change category does not warrant further review;

(5) there are no novel or unique design features that require additional review; and

(6) there are no questions, issues or problems arising from the Part 1 assessments that require additional investigation or review.

b. A Level 1 review requires an examination of the information contained in the top-level certification documentation, such as the Type Certificate, Supplemental Type Certificate (STC), Type Certificate Data Sheet (TCDS), Approved Flight Manual (AFM) and Master Minimum Equipment List (MMEL). The Level 1 review shall include a review of any exemptions, deviations, equivalent safety findings and special conditions identified in the Certification Basis. Once the review has been successfully completed, the results may be applied toward obtaining a DND Type Certificate in accordance with Part 2, Chapter 1 or Part 3, Chapter 2.

c. **Level 2 - Limited Review.** A Level 2 review shall be applied as follows:

(1) whenever there are questions, problems or issues arising from the Part 1 assessments that require additional investigation or review. These may include questions about the acceptability of the airworthiness standards or processes used to approve the design or whether the design is applicable to a DND aircraft; or

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(2) whenever the TAA determines that there are specific aspects of the certification work that require a Level 2 review. The TAA will specify the scope of the review to be performed and the technical requirements to satisfy the review.

d. The scope of the Level 2 review shall include all of the elements from the Level 1 review plus a limited examination of the documentation and technical data from the compliance program. Normally, the extent of the review of the compliance program documentation will be limited to that necessary to answer the questions, resolve the problems or address the issues raised during the Part 1 assessments. As with the Level 1 review, once the Level 2 review has been successfully completed, the results may be applied toward obtaining airworthiness approval in accordance with Part 2, Chapter 1 or Part 3, Chapter 2.

e. **Level 3 - Comprehensive Review.** A Level 3 review shall be applied when the results from the Part 1 - Assessments of Acceptability and Applicability indicate that a detailed examination is required to validate any of the compliance program elements. A Level 3 review will normally be required:

(1) when it is not possible to establish the acceptability or applicability of the processes, standards or documentation employed during the original certification program;

(2) if there are novel or unique design features that require a comprehensive examination beyond that which would be addressed under a Level 2 review; and

(3) if the TAA determines that there is a need to perform a comprehensive examination of any physical differences or operational usage differences between what was originally certified and the version of the design that will be incorporated into a DND-registered aeronautical product; or

(4) whenever the TAA determines that there are specific aspects of the certification work that require a Level 3 review. The TAA will specify the scope of the review to be performed and the technical requirements to satisfy the review.

f. The scope of the Level 3 review shall include all of the elements from the Level 1 and Level 2 reviews plus, where required, a detailed examination of the documentation and technical data from selected areas of the original certification program. A Level 3 review includes many of the activities associated with making a formal finding of compliance, with one important distinction. A Level 3 review does not require the reviewer to make a formal finding of compliance or confirm that compliance with the certification requirement has been completely demonstrated. The Level 3 review shall, where required, validate that the results from the original design approval are acceptable to the TAA. Validation of the results only requires that the reviewer examine enough data to establish that the conclusions and findings of the person making the original finding are acceptable to the TAA. As with the Level 1 and Level 2 reviews, once the Level 3 review has been successfully completed, the results may be applied toward obtaining airworthiness approval in accordance with Part 2, Chapter 1 or Part 3, Chapter 2.

5. **Recording of TDE Results.** The results from Part 1 and Part 2, of the TDE process must be recorded and the documentation inserted into the appropriate section of the type record of the aeronautical product. The TDE records must, as a minimum, address the following:

a. The results of the assessments of acceptability and applicability;

b. The results of the type design review;

c. Identification of any DND or Canadian certification requirements that have either not been included in the original Certification Basis or were not completely addressed in the original certification program;

d. Identification of any questions or matters that require clarification with the original certifying organization;

e. Identification of any items from the TDE that require resolution prior to credit being granted; and

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f. Identification of any observations made during the TDE that are pertinent to the introduction of the product into DND operational service or the incorporation of a design change into a DND registered aeronautical product, but do not require resolution prior to the TAA granting credit for the original certification work.

ADVISORY NOTE

Each of the review results should include, as necessary, the following information:

a. *an identification number;*

b. *the date on which the review was performed;*

c. *the design/product affected;*

d. *the subject;*

e. *certification specialty or discipline involved;*

f. *reference airworthiness requirement (TAM/ADSM reference or certification basis item);*

g. *the review result category (Issue, Concern or Observation);*

h. *a statement of the review result; and*

i. *recommended remedial action.*

6. The results of the TDE, including all of the documentation submitted or referenced to support the TDE process must be incorporated into the type record for the DND aeronautical product associated with the design. The documentation requirements for design and design change certifications as identified in Part 2, Chapter 1 and Part 3, Chapter 2 are also applicable when the TDE results are applied toward obtaining airworthiness approval of a DND type design or design change.

7. **Application of Credit Towards Airworthiness Approval.** Upon completion of the TDE process, the amount of credit that will be given to the previous certification work will be determined by the TAA or an authorized individual. The results from the TDE process may be applied towards obtaining a DND Type Certificate or design change certification approval as follows:

a. where a Military Type Certificate is being sought for a new aircraft type, the amount of credit granted by the TAA shall be identified and included in the Certification Plan, as described in Part 2, Chapter 1; and

b. in the case of a design change to a DND-registered aeronautical product, the amount of credit granted by the TAA or by an authorized individual shall be identified and included in the approval documentation for the design change, as described in Part 3, Chapter 2.

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SECTION 3

ADVISORY MATERIAL

NOTE

In an effort to provide Advisory Material to TAM users as rapidly as possible, all applicable Advisory Material will be published in the form of TAA Advisories, and will be posted on the DTAES websites, which are updated regularly. The Advisory Material presented in this section will eventually be converted into a TAA Advisory.

2.5.3.1 Purpose

1. This advisory material sets forth a method of compliance with the requirements of 2.5.2.R1 and 2.5.2.S1, pertaining to TDE. It is for guidance purposes and provides a method of compliance that has been found acceptable to the TAA. The applicant may elect to follow an alternate method, provided the alternate method can be demonstrated to be acceptable to the TAA. It should be noted that the TDE process may be customized and streamlined to accommodate the specific project or fleet support program as long as the basic steps are addressed. It is recognized that the level of effort for examination of an initial type design approval versus a design change (repair or modification) may differ and can be addressed by specific EPM processes approved by the TAA.

2.5.3.2 Type Design Examination (TDE)

1. **General.** One precept of the Technical Airworthiness Program is to, whenever possible, minimize the duplication of effort by giving credit to certification work performed by other organizations. Certification work acceptable to the TAA and applicable to a DND-registered aeronautical product may be applied, in whole or in part, towards meeting the requirements for a DND Type Certificate, as described in Part 2, Chapter 1, or the certification of a design change as described in Part 3, Chapter 2. Credit may only be granted by the TAA or an authorized individual following the successful completion of the TDE process.

2. The following are examples of certification work performed by other organizations that may be subject to the TDE process*:*

a. Type certification of aeronautical products;

b. Supplemental type certification (STC) of design changes;

c. Limited STC (LSTC);

d. Repair design approvals / repair design certificate;

e. Parts manufacturing approvals (PMA);

f. Part design approvals (PDA);

g. Equipment certification / Technical Standard Orders (TSO);

h. Military qualification of aeronautical products;

i. Military qualification of design changes; and

j. Modification approvals.

NOTE

Foreign airworthiness organizations or military qualified design may use different terminology from that shown. The TAA is prepared to accept documentation that meets the same intent as the documents listed above.

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3. **Type Design Examination (TDE) Process.** As described in Section 1 of this Chapter, the acceptance of certification work performed by other airworthiness organizations requires the completion of a TDE. The TDE process consists of two parts:

a. Part 1 - Assessment of Acceptability and Applicability; and

b. Part 2 - Type Design Review.

4. **Type Examination Process Diagram.** Figure 2-5-3-1 depicts the TDE process. A description of each step in the TDE process is provided in Figure 2-5-3-2.

2.5.3.3 Part 1 - Assessment of Acceptability and Applicability

1. **Part 1 - Assessment of Acceptability and Applicability.** The objective of the assessment of acceptability is to establish the appropriate degree of confidence in the processes and standards used in the original certification program. The applicant is responsible for demonstrating that the design is "applicable" or suitable for incorporation into a DND aeronautical product, with particular attention to the intended military operating environment including any proposed changes to the original design. The results of this assessment will be used to determine what level of review is required. It should be noted that, if for any reason the acceptability or applicability assessment cannot be successfully completed, then the TAA may decline to give credit to any or all of the previous certification work.

2. **Designs Certified by Transport Canada.** It is the TAA's policy to accept certification work approved by Transport Canada that applies to a civil pattern aircraft on the DND registry. The acceptance is contingent upon compliance to the standards in this chapter.

3. **Designs Certified by Foreign Civil Airworthiness Authorities.** Applicants wishing to obtain credit for designs that have been previously certified by foreign civil airworthiness authorities may refer to any bilateral agreements that these authorities may have with Transport Canada. The existence of these bilateral agreements and the degree of confidence that Transport Canada has in the work performed by the foreign civil airworthiness authority may assist in obtaining the TAA's acceptance of the work. For example, given the historical interaction and the high level of confidence that Transport Canada and DND have in the U.S. Federal Aviation Administration (FAA) certification process, a design change approved by the FAA may be acceptable to the TAA with only a minimal (Level 1) review. Similarly, designs and design changes approved by other Group 1 countries listed in Transport Canada's ACPL 50 may also be accepted with only a Level 1 review.

4. **Applicant's Responsibilities.** Where TDE authority is retained by the TAA, then the individual (SDE, Project Manager, Weapon System Manager) or organization (ATO, PMO, Directorate) requesting TDE credit is considered to be the "Applicant". It is the applicant's responsibility to obtain the documentation required by the TAA to conduct the TDE. The applicant is responsible for providing the following information:

a. the name of the organization that performed the original certification work;

b. identification of the aeronautical product and type designation;

c. a summary description of the design or design change;

d. a description of the extent to which previous certification is proposed to be applied to a DND aeronautical product;

e. a summary description of the proposed strategy for obtaining a DND Type Certificate or for incorporating the design change into a DND-registered aeronautical product (may be addressed in the certification plan required in Part 3, Chapter 2 or Part 2, Chapter 1);

f. a description and explanation of any novel or unusual design features;

g. any changes proposed to the original design in order to meet the DND functional requirements or to allow installation in a DND aircraft; and

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h. a description and explanation of any significant differences between the planned DND operating environment / usage and the operating environment used by the original certification activity during the original certification program.

5. The Applicant is also responsible for providing to the TAA the following information and documentation pertaining to the original certification program:

a. **Standards.** The applicant is responsible for identifying the airworthiness standards (Certification Basis) that were applied to the original design. The standards will be assessed to determine if they are acceptable and appropriate against the proposed DND application as per Part 1, of the TDE process;

b. **Processes and Procedures.** The applicant is responsible for providing a summary description of the processes and procedures used during each phase of the certification process. Of interest are:

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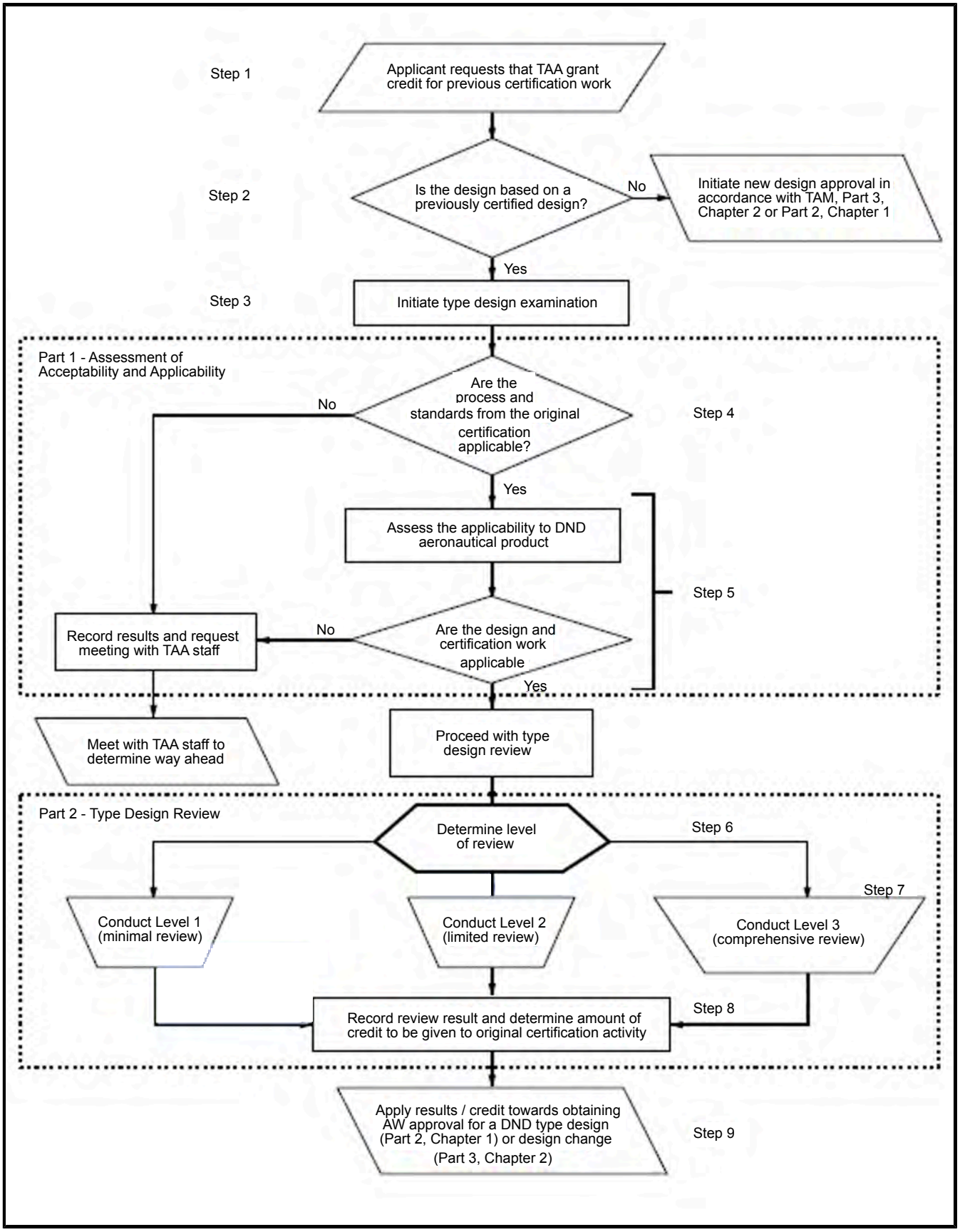

Figure 2-5-3-1 Type Design Examination (TDE) Process

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Process Steps		Comments
Applicant requests credit (Step 1)		The Applicant (Project Manager or Weapon System Manager) submits a request to the TAA for credit to be applied to the certification work for a design or design change approved by another airworthiness authority. **NOTE** *This step may be omitted if the TDE is being performed by an Authorized Individual (i.e., Senior Design Engineer) whose design change approval authority includes authority to grant credit.*
Is the design based on a previously approved design? (certified or military qualified) (Step 2)		If Yes – Then conduct a TDE. **NOTE** *This includes the situation where a formal approval has not been issued by an airworthiness authority, but where certification work has been performed that may be acceptable to the TAA. (For example, where an OEM or Design Authority has performed all or part of the compliance activities required in the design change approval process, such as making findings of compliance, then it would be appropriate to proceed with a TDE.)* If No – Then credit cannot be granted and a new certification program is required to approve the design. Refer to the design or design change certification chapters of the TAM, Part 2, Chapter 1 or Part 3, Chapter 2, respectively.
Initiate the TDE Process (Step 3)		Initiate Part 1 of the TDE process – Assessment of Acceptability and Assessment of Applicability. Refer to TAM 2.5.2.S1.
Part 1 – Assessment of Acceptability and Applicability	Acceptability. Are the airworthiness standards and processes used in the original certification program acceptable? (Step 4)	Perform an Assessment of Acceptability to determine the following: (Refer to 2.5.2.S1.2.a) 1. Are the airworthiness standards used to certify teh design acceptable to the TAA? 2. Are the processes and procedures acceptable to the TAA? 3. Are the results of the hazard and safety assessments acceptable to the TAA? 4. Is the compliance documentation from acceptable to the TAA? If all of the above are acceptable, then proceed to the Assessment of Applicability. If not, then the TAA may not give full credit to the original certification activities.

Figure 2-5-3-2 (Sheet 1 of 2) Type Design Examination (TDE) Process Steps

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Process Steps		Comments
	Applicability. Determine the extent to which the results from the original certification program can be applied towards certifying the DND design. (Step 5)	Perform an Assessment of Applicability to determine the applicability of the design and its associated certification work (Refer to 2.5.2.S1.2.b). The assessment will address the following: 1. Are there any significant differences between the original design and the design to be incorporated into the DND registered aeronautical product? 2. Are there any significant differences in the intended operating environment? 3. Are there any significant differences in the roles and functions? 4. Are there any special conditions, exemptions, deviations or limitations associated with the original design or required for the DND implementation of the design?
	Is the design applicable? (Step 5)	If Yes – Then conduct the Type Design Review. If No – Then the TAA and applicant meet to determine a way ahead.
Conduct the Type Design Review		Initiate Part 2 of the TDE process – Type Design Review. (See 2.5.2.S1.3)
Part 2 – Type Design Review	Determine level of review (Step 6)	Based upon the results of the assessment performed in Part 1, the appropriate level of review is identified. (See 2.5.2.S1.4)
	Conduct Level 1, Level 2 or Level 3 review (Step 7)	Level 1 Review: A review of the “top-level” documentation. (i.e., type, TCDS, AFM, MMEL, etc.) Level 2 Review: Level 1 review items, plus a limited review of the technical data for selected aspects of the compliance program. (i.e. special conditions, findings of equivalent safety, Canadian/DND unique requirement, exemptions or deviations.) Level 3 Review: Level 1 and Level 2 review items, plus a comprehensive review of the technical data from selected aspects of the compliance program. The objective of the Level 3 review is to “validate” the appropriateness and adequacy of the Certification Basis, means and methods of compliance, compliance findings and documentation.
	Record TDE Results (Step 8)	The TDE results must be documented in accordance with 2.5.2.S1.5.
	Determine amount of credit to be given (Step 8)	Upon Completion of the Level 1, Level 2 or Level 3 Reviews, the TAA will determine the amount of credit that can be given to the original certification activities.
Apply credit towards obtaining a DND Type Certificate or design change approval (Step 9)		Results of the TDE process may be applied towards design approval requirements of Part 2, Chapter 1 or Part 3, Chapter 2.

Figure 2-5-3-2 (Sheet 2 of 2) Type Design Examination (TDE) Process Steps

(1) the system safety assessment/hazard analysis;

(2) the processes for selecting and approving the means and methods of compliance;

(3) the process for assigning finding authorities; and

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(4) the process for reviewing compliance reports.

c. **Documentation.** The applicant is responsible for arranging access to the following certification program documents from the original certification program, or equivalent. Where the original certification program has not yet been completed, if available, draft versions of the documents should be provided:

NOTE

Not all airworthiness authorities use the listed terminology. The TAA is prepared to accept documentation that meets the same intent but uses different terminology.

(1) Type Certificate;

(2) Technical Standard Orders (TSO);

(3) Design specification;

(4) Design data list;

(5) Design data package;

(6) Supplemental Type Certificate (STC);

(7) Limited STC (LSTC);

(8) Type Certificate Data Sheet (TCDS);

(9) Technical standard;

(10) Findings of equivalent safety, exemptions and deviations;

(11) Special conditions;

(12) System safety assessment;

(13) Approved Flight Manual (AFM);

(14) Instructions for Continued Airworthiness (ICA);

(15) Compliance program document (checklist); and

(16) Airworthiness Directives (AD).

2.5.3.4 Part 2 - Type Design Review

1. The Type Design Review may be accomplished by applying one or more of the levels of review to the original certification work, in whole or in part. The levels of review to be performed will depend upon the acceptability of the certification work from the original certification program and the complexity of the design. The results from Part 1 of the TDE will be used to determine the appropriate review level.

2. As described in 2.5.2.S1.4, a Level 1 review is a review of the top-level documents from the original certification program. The Level 2 and 3 reviews add the requirement for the following:

a. a review of portions of the compliance documentation and associated technical data, with the scope and depth of the review to be determined based upon the results of the assessments of acceptability and applicability; and

b. one or more on-site visits by members of the TAA specialist staff, or delegates, to the design and/or manufacturing facilities.

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3. Where the TDE is to be conducted concurrently with the original certification program, the type design review may be performed using a staged approach to allow DND participation in design reviews or to review draft versions of compliance documentation.

4. **Establishing the Level(s) of Review.** The level of review will be determined based on the information provided in the applicant's briefing and the assessments of acceptability and applicability. A single level of review may be applied to the entire design or different review levels may be applied to individual aspects of the design. The following guidance is provided in establishing the appropriate level of review:

a. **Level 1 - Minimal Review.** Since the Level 1 review is an acceptance of the design without formal examination of the compliance documentation, it is essential that the review provide the TAA with a high degree of confidence in the processes and standards employed by the original certification activity. A prerequisite for a Level 1 review is the successful completion of the assessments of acceptability and applicability. It also assumes that there are no significant differences, either physical or operational usage differences, between the originally certified design and the manner in which this design will be incorporated into a DND aeronautical product. If the differences are minimal, then acceptance can be based solely upon examination of the documentation submitted by the applicant.

b. **Level 2 - Limited Review.** A Level 2 review expands upon the Level 1 review by adding a limited review of the original certification program documentation in specific areas of interest. A Level 2 review will normally be used when there are questions or issues associated with the previous certification activity for which the TAA requires more information. A Level 2 review is indicated when the results from the Part 1 assessments of acceptability and applicability have identified a question or issue. These questions or issues may be related to the following:

(1) acceptability of the standards, processes and procedures;

(2) acceptability of any exemptions or deviations;

(3) acceptability of any equivalent safety findings and special conditions;

(4) applicability of the original certification work;

(5) availability of data from the original certification program;

(6) differences in operational usages; and

(7) changes proposed to the design.

c. The Level 2 review is differentiated from the Level 1 review in that the Level 2 review may undertake to assess compliance documentation in specific or limited areas. In addition to the areas of interest for a Level 1 review, a Level 2 review will focus on the following areas:

(1) Determining the requirement for any additional technical conditions to address any DND or Canadian specific certification requirements;

(2) Assessing any novel or unusual design features that required, or would require the use of special conditions;

(3) Differences, physical or operational, between the originally certified design and how this design will be incorporated into a DND aeronautical product;

(4) Assessing any exemptions or deviations granted by the original certifying authority; and

(5) Assessing any findings of equivalent safety made by the original certifying authority.

d. The Level 2 review may concentrate on the following aspects:

(1) Review of documentation or technical data from selected areas of the certification program;

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(2) Investigating the impact of any differences, physical or operational, between the originally certified design and assessing how these differences will be incorporated into a DND-registered aeronautical product;

(3) Review of any exemptions or deviations granted by the original certifying authority;

(4) Review of any findings of equivalent safety made by the original certifying authority; and

(5) Review of any novel or unusual design features including any associated special conditions.

e. **Level 3 - Comprehensive Review.** A Level 3 review is a detailed review that will be applied to a design or design change that requires an in-depth examination of the compliance program documentation. This comprehensive review may be applied to the entire design or selected aspects of the design. A comprehensive review will be required if there are significant changes proposed to the originally certified design in order to adapt that design for incorporation into a DND aeronautical product. In addition to the areas of interest listed for the Level 1 and 2 review, the Level 3 review may require a validation of the acceptability of the following:

(1) the Certification Basis;

(2) the means used to demonstrate compliance;

(3) the compliance documentation; and

(4) the conclusions and decisions of the original finding authorities.

5. **On-site Visits to Design and/or Manufacturing Organizations.** On-site visits by the TAA to the design authority's location and/or the site of manufacturing may be undertaken, where necessary, for the purpose of:

a. obtaining an understanding of the design;

b. reviewing compliance documentation;

c. assessing the requirement for any follow-on certification activity;

d. obtaining adequate knowledge of the manner in which the product design complies with the type certification basis;

e. determining the adequacy of the proposed DND Certification Basis;

f. obtaining information related to the continuing airworthiness limitations; and

g. establishing that satisfactory procedures exist for controlling changes to the type design.

6. Any or all of the following activities may be required to fulfil the objectives of the compliance documentation review:

a. **Specialist Discussions.** TAA specialists may be required to meet with specialists for the original certification activity and/or OEM as a complementary activity to the review of compliance documentation. The purpose of these meetings would be to gain the in-depth understanding necessary to resolve particular questions or concerns.

b. **Group Briefings and Discussions.** The TAA may request that briefings or group discussions with original certification activity or OEM staff be organized as a preliminary to specialist discussion. The purpose of the briefings or discussion would be to ensure that the individual specialist discussions develop from a common understanding of the subject.

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c. **Design Review.** During Level 2 and Level 3 reviews, specific attention will be paid to particular areas or components of the design, including the design description documents and proof of compliance documentation.

d. **Review of Manuals.** A review of the flight manual, flight manual supplement or other manuals approved during the original certification program will be conducted to determine their acceptability and to define any changes necessary for DND;

e. **Maintainability Review.** A review of the design and/or product will be performed to assess the impact of the DND operating environment on the Instructions for continued airworthiness and the maintainability of the aeronautical product.

7. **Documentation of Type Design Review Results.** The review results will be documented according to the following categories:

a. **Review Issues.** This category of review results is used to identify DND or Canadian certification requirements that have either not been included in the original Certification Basis or were not completely addressed in the original certification program. The following are examples of items in this category that will need to be resolved before the TAA issues a DND type certificate or approves a design change:

(1) DND/Canadian additional airworthiness requirements.

(2) DND/Canadian special conditions.

(3) DND/Canadian exemptions, deviations or findings of equivalent safety.

(4) DND/Canadian design-related operational requirements.

b. **Review Concerns.** This category of review results is used to identify questions or matters that require clarification with the original certifying organization. Concerns are open items from the TDE that require resolution prior to the applying credit for the original certification work towards a design approval. Concerns will normally be addressed during visits to the original certifying organization agency or by appropriate correspondence. This category of findings is generally related to:

(1) Any areas where the means of compliance used to certify the design requires clarification.

(2) Any areas where the finding of compliance by the original certifying organization requires clarification.

c. **Review Observations.** This category of review results is used to identify observations that are made during the TDE that are pertinent to the introduction of the product into DND operational service or the incorporation of a design change into a DND-registered aeronautical product. These observations are not considered as open items requiring resolution prior to the TAA determining how much credit will be given to the original certification work.

2.5.3.5 Application to a DND Type Certificate

1. Upon completion of the TDE, as summarized in the review findings, the TAA will determine the amount of credit that may be given to the previous certification work. This "TAA-accepted" data may be applied towards obtaining a DND Type Certificate. In the case of a design change approved by another airworthiness authority, the results from the original certification program would be submitted in accordance with the process described in Part 3, Chapter 2, for obtaining TAA approval of a design change. If the certification program was for a complete aeronautical product, then the Applicant may request the TAA issue a DND Type Certificate, in accordance with Part 2, Chapter 1. The

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TAA may also specify additional requirements that the Applicant must meet in order to obtain a DND type certificate. These additional requirements may include:

a. Addressing any Canadian or DND specific certification requirements or special conditions in the Certification Basis. For example, these may include requirements associated with extending the limits for operations in cold weather or icing conditions; and

b. Addressing any review issues, concerns or observations raised during the TDE, including the requirement to provide the TAA with supplemental data where the TAA was not able to validate compliance. For example, if the review results showed that the airworthiness standards, means of compliance or compliance data did not adequately demonstrate the airworthiness of the design, then the TAA may require that additional analysis, demonstrations or tests be performed.

2.5.3.6 Airworthiness Organizations

1. The following are three types of airworthiness organizations from whom certification activities may originate:

a. Civil Airworthiness Authorities.

b. Military Airworthiness Authorities.

c. Other organizations, such as the original Design Authority/Original Equipment Manufacturer (OEM) who may be acceptable to the TAA in specified design areas.

2. **Civil Airworthiness Authorities.** Examples (list is not complete) of civil airworthiness authorities include the following:

a. Canada (Transport Canada - TC);

b. U.S.A. (Federal Aviation Administration - FAA);

c. United Kingdom (CAA);

d. France (DGAC);

e. Germany (LBA);

f. Italy (ENAC);

g. Netherlands (RLD); and

h. Australia (CAA).

3. **Military Airworthiness Authorities.** Examples (list is not complete) of military airworthiness authorities include the following:

a. U.S.A. (U.S. DoD - USAF and USN);

b. United Kingdom (UK MoD);

c. Australia (RAAF/DGTA);

d. Germany (WTD-61);

e. Italian Ministry of Defence;

f. France (DGAD); and

g. NATO Helicopter Design and Development Production and Logistics Management Agency (NAHEMA).

4. **Other Organizations.** Other airworthiness organizations are organizations that are involved in the design and certification of aeronautical products, but are not part of a civil or military airworthiness authority. An example of

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other airworthiness organization includes the original equipment manufacturers (OEM) who have demonstrated that they are competent and capable of designing aeronautical products as well as, participating in the certification of those designs.

5. Other airworthiness organizations performing certification activities that may be given credit by the TAA include the following:

a. design and technical organizations formally approved by their civil airworthiness authorities. For example Transport Canada approved organizations (Examples include: Transport Canada Civil Aviation Approved Design Organization, Approved Engineering Organization, and FAA approved organizations;

b. design and technical organizations formally approved by their military airworthiness authorities. For example, UKMoD and U.S.DoD authorized organizations;

c. design and technical organization formally recognized by the TAA, as described in Part 1, Chapter 4;

d. design organizations, acceptable to the TAA, for equipment that is being or has been procured by DND; and

e. other competent design organizations deemed acceptable to the TAA.

6. For the TAA to give credit to work performed by a design authority that has not otherwise been formally approved, authorized or recognized by the TAA or another airworthiness authority, the design organization will be evaluated against the following criteria:

a. demonstrated expertise in the applicable design disciplines;

b. accountability for the in-service safety of the design;

c. an industry demonstrated track record;

d. use of airworthiness standards acceptable to the TAA;

e. employing practices, procedures and processes acceptable to the TAA; and

f. experience working under the oversight of airworthiness authority.

2.5.3.7 Reference Material

1. **Comparison with Transport Canada's TDE Process.** The TCCA TDE process, formerly called "Validation" and "Verification" is described in the following Transport Canada publications:

a. Airworthiness Manual Advisory (AMA) 511/2 - Type Certification of Foreign Type Designs of Aeronautical Products including Related Airworthiness Activities.

b. Aircraft Certification Policy Letter (ACPL) 50 - Canadian Type Certification - Import Aeronautical Product.

2. In accordance with the objectives of the DND/CAF Airworthiness Program, the DND Type Design Examination process has been developed to parallel the Transport Canada process and to employ similar terminology. The following Transport Canada documents are recommended reading for further background:

a. Aircraft Certification Policy Letter (ACPL), Number 50, titled: Canadian Type Certification - Import Aeronautical Products;

b. Airworthiness Manual Advisory (AMA) 511/2 - Type Certification of Foreign Type Designs of Aeronautical Products Including Related Airworthiness Activities;

c. Airworthiness Manual Advisory (AMA) 513.20 - Approval of Foreign Design Changes to the Type Design of Aeronautical Products; and

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d. Aircraft Certification Staff Instruction (ACSI) No. 23 - Acceptance and Approval of Foreign Design Change.

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PART 2
INITIAL AIRWORTHINESS

CHAPTER 6 - MASTER MINIMUM EQUIPMENT LIST (MMEL)

SECTION 1

INTRODUCTION

2.6.1.1 Purpose

1. A Master Minimum Equipment List (MMEL) is an approved document created specifically to regulate the dispatch of an aircraft type with inoperative equipment. This list:

a. identifies the conditions and minimum equipment for an aircraft to maintain conformity with the applicable approved type design;

b. identifies the conditions and minimum equipment which may be inoperative while maintaining the level of safety of the aircraft type dictated by the type of operation for which the aircraft was certified and the minimum standards specified in the Certification Basis;

c. defines the maintenance and/or operational procedures necessary to maintain the required level of safety;

d. defines the maintenance procedures necessary to secure any inoperative equipment; and

e. is tailored to the operator's aircraft, role, and operating environment.

2. A MMEL is neither a mandatory airworthiness requirement nor a condition of aircraft type certification. If produced, the MMEL is an alleviating document, permitting the operation, for short periods, of aircraft with inoperative equipment.

3. Operation of an aircraft with certain secondary airframe parts missing may be permitted through the use of an approved Configuration Deviation List (CDL). The CDL should not be confused with the Minimum Equipment List (MEL). MELs are associated with inoperative equipment and systems. If produced, a CDL will normally be included as an appendix to the Aircraft Flight Manual (AFM); however, a copy may be attached to a MEL for ease of reference by flight crews. For more information on CDLs, refer to 2.7.1.2.8.

2.6.1.2 Overview

1. Civil regulators define MMEL as a document which supports an aircraft type (green aircraft), while MELs are tailored by each operator operating the aircraft type to meet the specific configuration and its associated operating environment. Within the CAF, aircraft are normally acquired as a type design which has been modified before delivery to fit the intended operating role. In addition, there is only one operator of the aircraft type. For this reason, the DND airworthiness program does not require that an initial MMEL be converted into an MEL. Instead, a single document called an MMEL is maintained.

2. MMEL are normally developed and delivered by the Original Equipment Manufacturer (OEM) as part of a contractual agreement between the OEM and the applicant during new aircraft type certification, or as a post-certification activity by DND for in-service fleets. The development, amendment and approval of the MMEL is dependent on the aircraft manufacturer as the primary source of information on any aircraft or system.

3. It is never desirable that aircraft be dispatched with inoperative equipment. Such operations are only permitted as a result of careful analysis of each item to ensure that an acceptable level of safety, as established in the Certification Basis, is maintained. Furthermore, analysis must verify that the inoperative equipment does not

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contravene existing airspace navigation regulations and consider the impact of operating the aircraft with inoperative equipment over extended periods of time or within areas that are outside the aircraft's normal operating environment.

4. MMELs developed for revenue based-based commercial operators reflect a strict adherence to regulations established during type certification to account for structured routes and passenger carrying flights. RCAF aircraft must be provided with an MMEL that supports a wide range of military operations conducted in many global locations. Due to the nature of these operations, some degree of leniency may be required during MMEL development to allow for aircraft to be ferried to a suitable location for repairs. To accomplish this, military MMELs employ a "Category A" repair code, which permits the dispatch of an aircraft strictly for the purpose of allowing the aircraft to return to base or a repair facility on non-operational flights. To effectively reduce the exposure time associated with the inoperative equipment, the MMEL may include the imposition of additional operational limitations (e.g., VFR only).

5. Selection of items of equipment to be included on a MMEL involves both operational and technical staff. Further, the analysis required to support MMEL approval involves flight and engineering specialists. Consequently, the Operational Airworthiness Authority (OAA) and the Technical Airworthiness Authority (TAA) must jointly approve the development and/or amendment of MMEL. The rules and standards governing the content, development and/or amendment to MMEL, are provided in Section 2 of this Chapter.

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SECTION 2

RULES AND STANDARDS

2.6.2.R1 MMEL Content

1. An approved MMEL shall include the topics specified in 2.6.2.S1.

ADVISORY NOTE

TAA Advisory 2013-07 – Joint TAA-OAA Guidance for the Development of an Initial Master Minimum Equipment List provides a centralized source of guidance information to facilitate the development and approval of an initial MMEL.

2.6.2.S1 MMEL Content

1. **Introductory Information/Format.** The MMEL shall have an introductory section, which at a minimum includes the following:

   a. Cover/approval page;

   b. Log of revisions/list of effective pages;

   c. A preamble which includes direction on MMEL use specific to the aircraft type;

   d. Table of Contents;

   e. A list of abbreviations, acronyms, and symbols used; and

   f. Definition of terms (if applicable).

2. **Equipment Identification.** The MMEL shall identify the items of equipment that may be inoperative for aircraft dispatch. All items related to the airworthiness of the aircraft, and not included in the MMEL, must be operative prior to flight.

3. **Repair Codes.** The maximum time an aircraft may be operated between the discovery of an inoperative item and its repair shall be specified in the MMEL. The category of all inoperative items must be determined according to specific time intervals. These time intervals are categorized as Repair Codes. At a minimum, the following repair categories shall apply:

   a. **Category A.** The time frame allotted to this category will be such that exposure to the failure condition is minimized and the aircraft is only dispatched for return to base or to a repair facility. Each fleet's MMEL preamble will define the limitations imposed (i.e., number of ferry flights for return to base). Additionally, the "Remarks" or "Exceptions" column may provide unique "A" code requirements.

   ADVISORY NOTE

   The TAA and/or OAA may provide additional limitations for individual fleets, such as "no passenger carriage".

   b. **Category B.** Items in this category shall be repaired within three (3) consecutive calendar days (72 hours), excluding the day the malfunction was recorded in the aircraft Maintenance Record Set (MRS).

   c. **Category C.** Items in this category shall be repaired within ten (10) consecutive calendar days (240 hours), excluding the day the malfunction was recorded in the MRS.

   d. **Category D.** Items in this category shall be repaired within one hundred and twenty (120) consecutive calendar days (2 880 hours), excluding the day the malfunction was recorded in the MRS.

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ADVISORY NOTE

Categories B, C and D repair codes may be expressed in terms of flying/running hour intervals provided the required level of safety is maintained. The category D repair code may be linked to a major maintenance action (i.e. repair to be carried out on or before the next major maintenance inspection), with a logical calendar backstop, if the items selected for this category can be justified. Further guidance on repair categories may be found at TAA Advisory 2013-07.

4. **Remarks or Exceptions.** Any conditions associated with inoperative equipment required to maintain an acceptable level of safety shall be included in the MMEL. Conditions and limitations include additional operational and maintenance procedures or changes to the aircraft mission profile and objective.

ADVISORY NOTE

References provided in the "Remarks or Exceptions" Section of the MMEL should bring attention to certain inter-relationships between the subject item and other MMEL items, as specified in the Aircraft Flight Manual or Aircraft Maintenance Manual. These references are intended to assist with compliance but do not relieve the operator of the responsibility for determining and/or assessing such inter-relationships.

5. **Operational and Maintenance Procedures.** Any inoperative items in the MMEL that require an operational or maintenance procedure to ensure an acceptable level of safety shall be so identified by an appropriate symbol. The details of such procedures shall be included in the MMEL. All operating or maintenance procedures shall provide clear direction to the crew members and maintenance personnel on the action to be taken.

ADVISORY NOTE

If the operations and maintenance procedures already exist in other documents, they may be referenced in the "Remarks or Exceptions" section of the MMEL. For the flight crew on the flight deck, manuals such as the Aircraft Flight Manual, Aircraft Operating Instruction, or the Manufacturer Operations Manual may be referenced. For the maintenance crew, manuals such as the Aircraft Maintenance Manual or Maintenance Control Manual may be referenced.

2.6.2.R2 MMEL Level of Safety

1. An MMEL shall identify items of equipment which may be inoperative only when it has been demonstrated that the level of safety as established in the certification basis of the aircraft has been maintained, in accordance with 2.6.2.S2.

ADVISORY NOTES

1. *Airworthiness regulations and standards applied to support such activities as passenger carrying operations may be considered too restrictive when applied to military operations. Relief may be justified in these situations through controlling the exposure time associated with the inoperative equipment. This would normally take the form of a ferry flight to the home unit or a place where repairs can be carried out and involve non-operational, non-passenger carrying flights. This relief does not negate the requirement for a comprehensive engineering review as stipulated in 2.6.2.S2.3 and 2.6.2.S2.4.*

2. *Due to the nature/primacy of military operations (e.g., defence of the country, search and rescue, aid to the civil power, natural emergencies), operational necessity may take precedence over the limitations imposed by an MMEL. For these situations, CFTO C-05-005-P09/AM-001,* Maintenance Program Implementation - Support Activities *provides guidance.*

2.6.2.S2 MMEL Level of Safety

1. The MMEL shall identify the items of equipment that may be inoperative while maintaining the level of safety of the aircraft type dictated by the type of operation for which the aircraft was certified and the minimum standards

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specified in the certification basis. The continued reliability of an aircraft system and the probability of total system failure following the dispatch of an aircraft with inoperative equipment must be considered during the engineering assessment of candidate MMEL items. Substantiation and justification shall be provided for each item of equipment that is to be included in the MMEL.

2. **Prohibited Items.** The MMEL shall not include:

a. any item, if inoperative, that is likely to significantly affect the take-off, landing, or climb performance of the aircraft or associated landing speeds presented in the Approved Flight Manual (AFM) unless the AFM specifies the effect and the MMEL draws attention to this fact;

b. any item that conflicts with the limitations, or an emergency procedure, in:

(1) an Airworthiness Directive (AD); or

(2) the AFM, unless an AD specifies otherwise; and

c. any item reducing the aircraft survivability without specific provisions that address exposure to this hazard.

3. **Means of Substantiating Level of Safety.** The ability to maintain an acceptable level of safety shall be substantiated by one or more of the following means:

a. The adjustment of operating limitations;

b. Transfer of the function to an operating component;

c. Reference to other instruments or components performing the required function or providing the required information;

d. Change in operating procedures; and/or

e. Change in maintenance procedures.

4. **Methods of Justification.** The assessment of an acceptable level of safety for an MMEL item shall involve one or more of the following methods of justification:

a. The equipment, including mission kit, which is considered optional;

b. The equipment is considered redundant;

c. A quantitative safety analysis;

d. A qualitative analysis; and

e. Applicability of regulations and standards to military operations.

5. **Airworthiness Approval.** The applicant for the airworthiness approval of the MMEL shall submit or provide access to, for TAA and OAA review and approval, appropriate engineering justification with sufficient detail of each item of equipment identified for inclusion in the MMEL, to ensure that the level of safety of the aircraft has been maintained as established during type certification and defined in the certification basis.

ADVISORY NOTE

Data approval is only granted once, in the official language in which the data was originally written. Translation of approved data does not require an airworthiness approval. It is the responsibility of the Applicant to ensure that appropriate translation services are in place that provide accurate translations of approved data.

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2.6.2.R3 MMEL Amendments

1. Changes to the content of an MMEL shall be done in accordance with 2.6.2.S3.

2.6.2.S3 MMEL Amendments

1. **MMEL Amendments.** The following changes to aMMEL shall be submitted to the TAA and OAA for joint approval:

   a. Adding items;

   b. Changing operational and maintenance procedures; and/or

   c. Changing the assigned Repair Code to a less restrictive category.

2. **Airworthiness Approval.** The applicant for the airworthiness approval of the MMEL amendment shall submit or provide access to, for TAA and OAA review and approval, appropriate engineering justification with sufficient detail of each amendment to the MMEL, to ensure that the level of safety of the aircraft has been maintained as established during type certification and as defined in the Certification Basis.

ADVISORY NOTE

A deviation request involving a “Category A” repair interval will be subject to a risk assessment in accordance with Part 5, Chapter 1. Regardless of the risk level assigned (ALOS or Higher), the TCH will notify the TAA (DTAES 4 staff) when a deviation involving a “Category A” repair interval has been approved and issued.

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SECTION 3

ADVISORY MATERIAL

NOTE

In an effort to provide Advisory Material to TAM users as rapidly as possible, all applicable Advisory Material will be published in the form of TAA Advisories, and will be posted on the DTAES websites, which are updated regularly. The Advisory Material presented in this section has been converted into TAA Advisory 2013-07 – Joint TAA-OAA Guidance for the Development of an Initial Master Minimum Equipment List.

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PART 2
INITIAL AIRWORTHINESS

CHAPTER 7 - CANADIAN ARMED FORCES FLIGHT PUBLICATIONS

SECTION 1

INTRODUCTION

2.7.1.1 Purpose

1. This Chapter describes the high-level requirements of fleet aircrew flight publications and addresses the means for amending approved content within Flight Manuals (FMs) and Aircraft Operating Instructions (AOIs). The concept of Technical Airworthiness Data (TAWD) and its relationship with flight publications are defined below.

2.7.1.2 Definitions

1. **Technical Airworthiness Data (TAWD)** - See glossary definition.

ADVISORY NOTE

Although the Type Record includes all airworthiness documentation required for certification, the FM is required to contain only that portion specified as TAWD in Annex A to Section 2 of this Chapter.

2. **Flight Manual (FM)** - See glossary definition.

ADVISORY NOTE

The FM should include at a minimum the operating limitations, procedures, performance data and loading information specified in Annex A to Section 2 of this Chapter. However, additional performance data and loading information may also be included; whether or not such data also requires TAA approval would be assessed on a case-by-case basis during Type Certification.

3. **Aircraft Operating Instructions (AOI)** - The AOI is the operational manual provided by the aircraft operator to aircrew. It is normally issued and approved by the Operational Airworthiness Authority (OAA). In general, the AOI complements the FM by providing aircraft and mission system information that is not included in the basic FM. Any TAWD reproduced in the AOI shall be consistent with that appearing in the FM. The TAA provides no oversight of the AOI.

ADVISORY NOTE

For the majority of DND/CAF aircraft types using an AOI as their primary flight document, it should be noted that there are no "pure" AOIs that do not contain at least some, if not all, of the TAWD. Therefore, most AOIs should be more correctly referenced as a combined FM/AOI, in accordance with the definition provided in paragraph 2.7.1.2.4.

4. **Flight Manual/Aircraft Operating Instruction (FM/AOI)** – In a majority of cases, DND/CAF fleets have no FM but simply an AOI, which, while containing the operational system and mission-oriented information to serve as the AOI, also contain the TAWD. In this case, the TAWD within this sole document constitutes the FM. When a single document only is provided as the FM and AOI, the TAWD shall be clearly identified as TAA-approved information and preferably segregated from all non-TAWD. Such documents are referred to as FM/AOIs and are jointly overseen by the TAA and the OAA.

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ADVISORY NOTE

For DND/CAF aircraft types that have a FM/AOI with no standalone FM, the rules, standards and Advisory Material of this chapter concerning TAWD content apply to the FM/AOI. The TAA retains approval authority for TAWD contained within an integrated FM/AOI.

5. **Standard Manoeuvre Manual (SMM)** - The SMM is an operational document produced by the aircraft operator under the authority of the OAA to provide aircrews with guidance regarding the manner in which the aircraft is to be flown to accomplish its intended missions. A SMM is produced for each aircraft operated by DND/CAF. The TAA provides no oversight of the SMM. A statement in the foreword of each SMM shall state that, in case of any disagreement between the SMM and the TAA-approved FM (or FM/AOI), the TAA-approved document has precedence.

ADVISORY NOTE

Some fleets have flight publications that are not approved by the TAA (e.g., CC150, CC177, etc.), but require additional TAWD to be published to satisfy unique DND/CAF requirements. In these cases, the SMM shall not be used to publish this data. A Flight Manual Supplement (see 2.7.1.2.9) shall be produced detailing all of the required data in an acceptable format and submitted to the TAA and OAA for approval.

6. **Aircrew Checklists** – The aircrew checklists are produced by the aircraft operator under the authority of the OAA to provide aircrew with ready access to the most pertinent information from the AFM, AOI, SMM or other documents, whilst operating on the ground or in flight. The checklist is an aide-memoire and shall not contain any information that has not already been approved and/or published in a higher-level document. The TAA provides no oversight of the aircrew checklists.

7. **TAWD Detailed Content** - The TAWD that must be provided in a FM and approved by the TAA comprises:

a. The limitations, procedures and data listed in Annex A to Section 2 of this chapter, including:

(1) AFM content (front matter), definitions and general information specific to the AFM;

(2) operating limitations;

(3) normal operating, emergency, abnormal and maintenance test flight procedures;

(4) performance information; and

(5) loading information.

b. Other information that is necessary for safe operation because of design, operating or handling characteristics.

c. The items above must include additional limitations, procedures and data necessary for the safe operation of the aircraft in any military-specific configuration or with any installed military equipment, such as:

(1) weapons or other stores;

(2) ejection seats;

(3) helmet-mounted flight crew systems;

(4) provisions for input to control the aircraft by crew members other than flight crew; and

(5) special purpose operations.

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8. **Configuration Deviation List (CDL)** - A CDL is an optional TAA-approved list of secondary external airframe parts that may be missing for dispatch. If furnished, a CDL is part of the TAWD.

ADVISORY NOTE

1. *Operation of an airplane with certain secondary airframe parts missing may be allowed through the use of an approved Configuration Deviation List (CDL). CDLs may be regarded as the structural equivalent of MMELs. Examples of the types of items listed in a CDL include fairings, access panels, vortex generators and static Discharge Wicks. CDLs may not include primary structure and, like MMELs, they address only the presence or absence of the listed items and take no account of degraded quality, such as dents, distortion, cracks or corrosion. In certain cases, the CDL may allow deferral of rectification action for extended periods, such as the next scheduled check. If produced, the CDL should be included in the AFM as a separate appendix. A CDL must be prepared in accordance with a recognized standard or guidance document (e.g., FAAAC No: 25-7A) and must be approved by a regulatory authority. For more information on MMELs, refer to Part 2, Chapter 6.*

2. *The CDL should not be confused with the Minimum Equipment List (MEL) described in Part 2, Chapter 6. The MEL deals with the dispatch of an aircraft with equipment that is installed but is inoperative or temporarily removed; changes to external aircraft configuration are not included in the MEL.*

9. **Flight Manual Supplement** – A Flight Manual Supplement (FM Supp) may be developed to satisfy unique DND/CAF certification requirements where the aircraft is operated using a FM that is not subject to TAA oversight. A FM Supp may also be issued on the authority of the TAA where a formal change of the FM is not being made, or will be made at a later date.

10. Where a FM Supp is produced, it is recommended that the format of the supplement be consistent with the existing FM to the maximum practicable extent. The FM Supp must make reference to the approved FM to which it applies.

11. **Specific Purpose FM Supplement** - A Specific Purpose FM Supplement (SP FM Supp) may be developed for situations where the aircraft or its operations do not conform to the aircraft Type Design and it is, therefore, operating under the authority of one or more Specific Purpose Flight Permits (SPFP) issued in accordance with Part 5, Chapter 7, and:

a. in the case of multiple SPFPs, there is a potential for confusion over applicable operating restrictions and instructions; or

b. in the case of a single SPFP, the respective flight permit is expected to remain in force for an extended period (i.e., greater than 12 months).

12. The objective of a SP FM Supp is to provide consolidated operating restrictions and instructions to aircrews in a single document, without the extraneous information that typically appears on the underlying SPFP. It is recommended that the format of the supplement be consistent with the FM to the maximum practicable extent. The supplement must make reference to the enabling SPFP(s) and list their expiry dates.

2.7.1.3 AFM Amendment

1. Any amendment to FM/AOI content represents a Design Change and requires approval, in accordance with Part 3, Chapter 2. Amendments may be incorporated for a number of reasons and are generally dealt with using revisions, formal change packages or interim changes (sometimes known as temporary revisions).

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SECTION 2

RULES AND STANDARDS

2.7.2.R1 Flight Manual TAA-Approved Content

1. An applicant shall submit to the TAA for approval a Flight Manual (FM) for an aircraft type, as specified in 2.7.2.S1, when seeking airworthiness approval for a proposed type design.

ADVISORY NOTES

1. For those DND/CAF aircraft types that have an AOI or FM/AOI with no standalone FM, the terms FM, AOI and FM/AOI will be considered synonyms and used interchangeably, and the rules, standards and Advisory Material of this chapter concerning Technical Airworthiness Data (TAWD) content will apply. The TAA retains approval authority for TAWD in this case.

2. Some fleets have flight publications that are not approved by the TAA (e.g., CC150, CC177, etc.), but require additional TAWD to be published to satisfy unique DND/CAF requirements. In these cases, a Flight Manual Supplement (see 2.7.1.2.9) must be produced detailing all of the required data in an acceptable format and submitted to the TAA and OAA for approval.

2.7.2.S1 Flight Manual TAA-Approved Content

1. The FM shall contain, as a minimum, the following Technical Airworthiness Data (TAWD), in sufficient detail to allow a trained crew to safely operate the aircraft. Further direction for a FM is specified in Annex A to this Section and it applies to fixed wing and rotary wing aircraft, including Unmanned Aircraft Systems (UAS):

a. The limitations, procedures and data listed in Annex A to Section 2 of this chapter, including:

(1) FM content (front matter), definitions and general information specific to the FM;

(2) operating limitations;

(3) normal operating, emergency, abnormal and maintenance test flight procedures;

(4) performance information; and

(5) loading information.

ADVISORY NOTE

Additional performance data and loading information may also be included; whether or not such data also requires that TAA approval be assessed on a case-by-case basis during Type Certification.

b. Other information that is necessary for safe operation because of design, operating or handling characteristics.

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ADVISORY NOTES

1. *Operation of an airplane with certain secondary airframe parts missing may be allowed through the use of an approved Configuration Deviation List (CDL). CDLs may be regarded as the structural equivalent of MMELs. Examples of the types of items listed in a CDL include fairings, access panels, vortex generators and static Discharge Wicks. CDLs may not include primary structure and, like MMELs, they address only the presence or absence of the listed items, and take no account of degraded quality, such as dents, distortion, cracks or corrosion. In certain cases, the CDL may allow deferral of rectification action for extended periods, such as the next scheduled check. If produced, the CDL should be included in the FM as a separate appendix. A CDL must be prepared in accordance with a recognized standard or guidance document (e.g., FAAAC No: 25-7A) and must be approved by a regulatory authority. For more information on MMELs, refer to Part 2, Chapter 6.*

2. *The CDL should not be confused with the Minimum Equipment List (MEL) described in Part 2, Chapter 6. The MEL deals with the dispatch of an aircraft with equipment that is installed but is inoperative or temporarily removed; changes to external aircraft configuration are not included in the MEL.*

c. The items above must include additional limitations, procedures and data necessary for the safe operation of the aircraft in any military-specific configuration or with any installed military equipment, such as:

(1) weapons or other stores;

(2) ejection seats;

(3) helmet-mounted flight crew systems;

(4) provisions for input to control the aircraft by crew members other than flight crew; and

(5) special purpose operations.

2. In order for the TAA to grant approval of the FM, the English version of the manual shall be submitted to the TAA. Approval of the FM will be granted for the English version only.

3. Any subsequent translation of the FM shall be subjected to a "Translation Accuracy Check" by a competent individual acceptable to the TAA.

4. The translated version of the FM will not be marked as "TAA-approved". Instead, it shall include a statement to the effect that "in the event of any discrepancy between this document and the TAA-approved English language version, the TAA-approved version will prevail".

5. The TAA-approved content of the AFM shall be identified as TAWD and must be clearly distinguishable from other information that may be contained within the AFM.

6. Before submitting the FM to the TAA for approval, the applicant must verify each part of the FM for traceability to the design operating limitations of the aeronautical product. This traceability document should be submitted with the FM as part of the approval process.

7. Each FM shall:

a. properly identify, cross-reference and present the system of units used, to prevent any misunderstanding;

b. present aircraft instrument readings in the same units as indicated by installed instruments;

c. provide a description of how TAWD is identified;

d. include a Table of Contents and a list of effective pages; and

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e. display the page number, the revision number and/or change date and number marked on each page.

8. Although the FM may not always be produced as a stand-alone document, it shall be the top-level document for TAWD. Reproduction of TAWD in any other aircraft operating manual, flight publication or checklist shall be consistent with TAWD that is contained in the latest version of the FM. If any discrepancy exists between the TAWD within the FM and that reproduced in other flight publications, the FM TAWD shall always take precedence.

2.7.2.R2 Flight Manual Amendments

1. Changes to the content of a FM shall be done in accordance with 2.7.2.S2.

2.7.2.S2 Flight Manual Amendments

1. **Flight Manual Amendments.** Any change to approved FM technical content and TAWD shall be submitted to the TAA and OAA for joint approval.

2. **Airworthiness Approval.** The applicant for the airworthiness approval of the FM amendment shall submit or provide access to, for TAA and OAA review and approval, appropriate engineering justification with sufficient detail of each amendment to the FM, to ensure that the level of safety of the aircraft has been maintained as established during type certification and as defined in the Certification Basis.

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ANNEX A

APPROVED FLIGHT MANUAL (AFM) TECHNICAL AIRWORTHINESS DATA (TAWD) CONTENT

1. **General.** Each aircraft shall be equipped with an AFM that will contain the following:

   a. information required by paragraphs 2 through 6 of this annex;

   b. other information that is necessary for safe operation because of design, operating, or handling characteristics;

   c. any limitation, procedure, or other information established as a condition of compliance with the applicable noise standards; and

   d. further information necessary to comply with the relevant operating rules.

ADVISORY NOTE

The terms "relevant operating rules" and "if required for certification" used in this Annex indicate that the Certification Basis for the aircraft must be consulted. The Statement of Operating Intent (SOI) may require compliance with operating rules and certification requirements that would not otherwise form part of the Certification Basis (e.g., installation of Traffic alert and Collision Avoidance System (TCAS); use of semi-prepared and snow-covered runways).

2. **AFM Contents (Front Matter).**

   a. **Table of Contents**. Each AFM shall include a table of contents.

   b. **TAA-Approved Information.** All TAWD that is appropriate to the aircraft shall be furnished, verified and approved. All TAWD shall be identified, preferably segregated, and clearly distinguished from each unapproved part of the manual.

   c. **Units**. The units used in the AFM shall be the same as those marked on the appropriate instruments and placards.

   d. **Airspeeds**. Unless otherwise specified, all AFM operating airspeeds shall be presented as indicated airspeeds.

   e. **Types of Surfaces and Contaminated Runways**. If required for certification, the AFM shall contain information in the form of approved guidance material for supplementary operating procedures, as well as performance information for operating on surfaces that are not smooth, dry, hard and level, including contaminated runways.

   f. **Multi-engine Aircraft.** One engine inoperative data required in paragraphs 2 through 6 of this annex shall be interpreted to include data for multiple engines inoperative for aircraft with more than two engines, if essential for safe flight or required for certification.

   g. **Warnings, Cautions, Notes**. The general section of each AFM shall include definitions for the warnings, cautions and notes used throughout the manual. These definitions shall be as described herein or may be submitted by the applicant for approval. The definitions shall be furnished in the same format that each WARNING, CAUTION and NOTE appears throughout the manual.

      (1) The format of each WARNING, CAUTION and NOTE shall be conspicuous such that:

         (a) the title is printed in capital letters, in a font that stands out from the remainder of the text;

         (b) the title (WARNING, CAUTION or NOTE) is the only word appearing on a line of text centred on the page; and

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(c) the text following the title is indented from both the left and right margins of the main body of text.

(2) All WARNINGs and CAUTIONs shall be written in a three-part format to include the situation causing the hazard, a description of the hazard and the mitigation of the hazard.

(3) The following definitions are acceptable:

(a) A WARNING highlights an essential operating procedure, practice, condition, statement, etc., which, if not promptly observed, could result in loss of the aircraft, or injury, long-term health hazards to, or death of, personnel. A WARNING is TAWD.

(b) A CAUTION highlights an essential operating procedure, practice, condition, statement, etc., which, if not observed, could result in damage to, or destruction of, equipment or loss of mission effectiveness. A CAUTION is TAWD.

(c) A NOTE is used to draw attention to an operating procedure, condition, or statement that is essential to emphasize and should be kept to a minimum to avoid loss of impact. A NOTE is not TAWD.

h. **Terminology.** The general section of each AFM shall include explanatory statements for the use of the words SHALL, MUST, WILL, SHOULD and MAY, as well as any other word for which the applicant determines a clarification is required. In addition, the intended meaning of the phrases *Land Immediately*, *Land as Soon as Possible* and *Land as Soon as Practicable* and *Continue Flight* shall be furnished, if used. These definitions shall be as described herein or may be submitted by the applicant for approval.

(1) **SHALL** - The instructions or procedures prefaced by SHALL are mandatory.

(2) **MUST** – The instructions indicate necessity. Used to express the compulsion, need, obligation, or duty for something in order to fulfill some need or achieve an aim. “Must” differs from “shall” in that “shall” is a mandatory command to a person or entity (“The Crew shall...” “The weight shall not exceed...”), whereas “must” is used in the sense of a statement of necessity within a statement of fact (“The water must reach 100° Celsius before it will boil.”)

(3) **WILL** - The instructions or procedures prefaced by WILL are mandatory. It is also used to indicate simple futurity and cause - effect relationships, i.e., "Loss of hydraulic power will affect operations."

(4) **SHOULD** - The instructions or procedures prefaced by SHOULD indicate a preferred, but non-mandatory method of accomplishment.

(5) **MAY** - The instructions or procedures prefaced by MAY indicate an acceptable, but non-mandatory, method of accomplishment.

(6) **LAND IMMEDIATELY** - An emergency condition exists in which the aircraft is in imminent peril and an immediate landing or ditching is imperative to prevent loss of life or loss of control of the aircraft.

(7) **LAND AS SOON AS POSSIBLE** - An emergency will be declared. A landing should be accomplished at the nearest suitable location considering the severity of the emergency, weather conditions, field facilities, ambient lighting, aircraft gross weight, and command guidance.

(8) **LAND AS SOON AS PRACTICABLE** - An emergency condition exists and, although the mission is to be terminated, the degree of emergency is such that an immediate landing at the nearest suitable location may not be necessary.

(9) **CONTINUE FLIGHT** – Completion of the mission, landing site and flight duration are at the discretion of the AC.

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i. **Helicopter Category**. All multi-engine helicopters shall be identified using the terms "Category A" and/or "Category B" with reference to helicopter limitations, procedures and performance. These terms are described briefly in the following sub-paragraphs.

(1) **Category A** provides the most rigid rules, requiring multi-engine design with independent engines, fuel systems and electrical systems. Category A design requires that no single failure can cause loss of more than one engine. Although there is no limit on maximum weight, Category A helicopters are certificated at a weight which will assure a minimum climb capability in the event of engine failure, and with adequate surface area, to assure a safe landing in the event that an engine fails anywhere in the flight envelope, including takeoff or landing operations.

(2) **Category B** helicopters may be single or multi-engine, and may not exceed a maximum weight of 20 000 pounds. Twin-engine Category B helicopters are not required to have the capability for continued flight with one engine inoperative.

j. **Unmanned Aircraft System (UAS).** A UAS includes, at a minimum, the following list of components:

(1) one or more Unmanned Aircraft (UA);

(2) one or more UAS Control Stations (UCS); and

(3) a command and control data link providing communication between the UA and the UCS.

k. Unless stated otherwise, each use of the word "aircraft" in this chapter, shall also apply to UAS. The AFM for a UAS applies to all components of the UAS and may be called a UAS Flight Manual.

l. Requirements applicable only to UAS are listed at the end of each section of the AFM.

3. **Operating Limitations**. The AFM shall contain operating limitations established during type certification, including, but not limited to, the list provided in this section.

a. **Airspeed Limitations - all aircraft.** When airspeed limitations are a function of weight, weight distribution, altitude, rotor speed (if applicable), power or other factors, airspeed limitations corresponding to the critical combinations of these factors shall be established. The following airspeed limitations as a function of other limiting factors necessary for safe operation shall be furnished:

(1) Information necessary for the marking of the airspeed and rotor speed (if applicable) limits on the indicator, the significance of each of those limits and of the colour coding used on the indicator. The airspeed limitations required shall be easily read and understood by the flight crew.

(2) If an airspeed limitation is based on compressibility effects, the AFM should include a statement to this effect, including information on any symptoms, the probable behaviour of the aeroplane, and the recommended recovery procedures.

(3) The AFM should also specify the landing gear operating speed(s), and include a statement explaining the speeds defined as follows:

(a) The established landing gear operating speed(s), V_{LO}, may not exceed the speed(s) at which it is safe to extend and to retract the landing gear. If the extension speed is not the same as the retraction speed, the two speeds shall be designated as $V_{LO(EXT)}$ and $V_{LO(RET)}$, respectively.

(b) The landing gear extended speed V_{LE} (if greater than V_{LO}), and a statement that this is the maximum speed at which the aircraft can be safely flown with the landing gear extended.

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b. **Fixed Wing Aircraft (Aeroplanes) Airspeed Limitations.** The following airspeed limitations shall be furnished.

(1) The maximum operating limit speed (V_{MO} / M_{MO}) and a statement that this speed limit may not be deliberately exceeded in any regime of flight (climb, cruise, or descent) unless a higher speed is authorized for flight test or pilot training.

(2) The manoeuvring speed (V_A) and a statement that full application of rudder and aileron controls, as well as manoeuvres that involve angles of attack near the stall, should be confined to speeds below this value, unless envelope protection is provided.

(3) The flap extended speed (V_{FE}) and the pertinent flap positions and engine power settings.

c. **Rotary Wing Aircraft (Helicopters) Airspeed Limitations.** When airspeed limitations are a function of weight, weight distribution, altitude, rotor speed, power or other factors, airspeed limitations corresponding with the critical combinations of these factors shall be established. The following airspeed limitations as a function of other limiting factors necessary for safe operation shall be furnished:

(1) an operating speed range;

(2) never-exceed speed (V_{NE});

(3) never-exceed speed power off, if different from V_{NE};

(4) maximum rearward flight speed; and

(5) maximum sideward flight speed.

d. **Rotary Wing Aircraft (Helicopters) Rotor Speed Limitations.** The following rotor speed limitations and any other limitations necessary for safe operation shall be furnished:

(1) maximum power-on;

(2) minimum power-on;

(3) maximum power-off;

(4) minimum power-off; and

(5) any rotor speed transient allowances.

e. **Powerplant Limitations.** For all aircraft, the following information shall be furnished:

(1) the powerplant and propulsion drive system limitations established during the Type Certification of the aircraft, so that they do not exceed the corresponding limits for which the engines or propellers (if applicable) are type certificated and do not exceed the values established to comply with any other requirement of the aircraft's Certification Basis. Propulsion drive system limitations include those applicable to transmissions and gearboxes;

(2) explanation of the limitations, when appropriate;

(3) information necessary for marking the instruments and displays in the aircraft or UCS as required for certification; and

(4) if an Auxiliary Power Unit (APU) is installed in the aircraft, limitations established for the APU, including the categories of operation, shall be specified as operating limitations for the aircraft.

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f. **Weight and Centre of Gravity.** The AFM shall furnish or enable the calculation of:

(1) the maximum take-off weight for each airport altitude and ambient temperature within the range for which the aircraft is certified;

(2) the maximum landing weight for each airport altitude and ambient temperature within the range for which the type is certified, if the certified design landing weight is less than the maximum weight;

(3) if applicable, the maximum zero wing fuel weight;

(4) if applicable, the maximum weight with a jettisonable external load, if greater than the maximum take-off weight specified in paragraph 3.f.(1);

(5) if applicable, the minimum weight established for certification;

(6) the centre of gravity limits established for certification; and

(7) if certification for more than one centre of gravity range is requested (such as may be required for acrobatic manoeuvres), the appropriate limitations with regard to weight and centre of gravity for each separate centre of gravity range.

g. **Flight Crew.** The number and functions of the minimum flight crew determined for safe operation shall be furnished.

ADVISORY NOTE

The minimum flight crew may vary depending on the configuration or assigned role of the aircraft.

h. **Manoeuvres.** Authorized manoeuvres, appropriate airspeed limitations and prohibited manoeuvres shall be furnished. If applicable, a list of approved acrobatic flight manoeuvres demonstrated in the type flight tests together with recommended entry speeds and any other associated limitations shall be furnished.

i. **Manoeuvre Load Factor.** For fixed wing aircraft (aeroplanes) only, the positive limit load factors and the negative limit load factor described in terms of accelerations shall be furnished.

j. **Ambient Air Temperatures.** Maximum and minimum ambient air temperatures limitations established during Type Certification shall be furnished.

k. **Operating Altitudes**. Maximum and minimum operating altitudes limitations established during Type Certification shall be furnished.

l. **Kinds of Operation**. The following information shall be furnished:

(1) a list of the kinds of operations authorized (such as, VFR, IFR, day, night or NVIS aided) and the meteorological conditions (e.g., icing) prohibited or to which the aircraft is limited; and

(2) a list of installed equipment that affects any operating limitation and identification as to the equipment's required operational status for the kinds of operation for which approval has been given.

m. **Extended Twin Engine Operations (ETOPS).** Certification for ETOPS, if applicable, shall be listed. In addition, the following shall be furnished for ETOPS:

(1) Special limitations, including those, if any, associated with operation of the aircraft up to the maximum diversion time being approved.

(2) The airborne equipment required for ETOPS.

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(3) The system time capability for the following:

(a) the most limiting fire suppression system for Class C cargo or baggage compartments; and

(b) the most limiting ETOPS significant system other than fire suppression systems for Class C cargo or baggage compartments.

(4) This statement shall appear in the flight manual: "The type-design reliability and performance of this airplane- engine combination has been evaluated and found suitable for (identify maximum approved diversion time) ETOPS when the configuration, maintenance, and procedure standards contained in (identify the Configuration Maintenance and Procedures document) are met. The actual maximum approved diversion time for this airplane may be less based on its most limiting system time capability. This finding does not constitute operational approval to conduct ETOPS."

n. **Number of Occupants.** The maximum number of occupants permitted in the aircraft or UCS shall be furnished.

ADVISORY NOTES

1. *The term "occupants" includes all flight crew and other persons embarked for take-off of an inhabited aircraft and occupying a seat equipped with a harness that provides an acceptable level of safety for the duration of the flight. The maximum number of occupants may vary depending on the configuration or assigned role of the aircraft.*

2. *For a UAS, occupants are those persons occupying the UAS Control Station (UCS). The number of UCS occupants is limited by its environmental capacity and the affect on flight crew workload.*

o. **Allowable Lateral Fuel Loading.** The maximum allowable lateral fuel loading differential shall be furnished, if less than the maximum possible.

p. **Baggage, Cargo and Payload Loading.** The following information shall be furnished for each baggage and cargo compartment or zone of an aircraft or for each payload zone of a UA:

(1) the maximum allowable load; and

(2) the maximum allowable intensity of loading.

q. **Systems.** Any limitations on the use of aircraft systems and equipment shall be furnished. The systems for which limitations shall be furnished are those essential for flight and those installed non-essential systems whose use affects flight safety and includes, but is not limited to, the following:

(1) automatic pilot;

(2) flight director;

(3) flight management system;

(4) de-icing/anti-icing equipment;

(5) electronic flight instrumentation, including head-up display;

(6) navigation equipment (e.g., Primary vs. Supplemental GPS rating); and

(7) navigation equipment providing required navigation performance (RNP) for area navigation (RNAV).

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r. **Types of Surfaces and Contaminated Runways.** A statement of the types of surfaces that are not smooth, dry, hard and level on which operations may be conducted and any applicable runway contamination limits shall be furnished, if applicable.

s. **Ditching.** If ditching or underwater egress is required for certification, any applicable limitations shall be furnished.

t. **Fluids.** A list of approved fuels, oils and other fluids shall be furnished.

u. **Configuration Deviation List (CDL).** The configuration deviation list (CDL), if applicable, shall be included as an appendix to the operating limits section of the AFM or incorporated by reference.

v. **Certification Performance Requirements.** Unless otherwise listed, the operating limitations established to meet any certification performance requirements shall be furnished.

w. **Additional Rotary Wing (Helicopter) Limitations.** For rotary wing aircraft (helicopters), the following limitations shall be furnished, if applicable:

(1) **Category A and B.** For a multi-engine helicopter, the AFM shall state whether the helicopter is certificated to: Category A; Category B with Category A design features; Category B, or both Category A and Category B.

(2) **Instrument Flight**. If certification for instrument flight is requested, the AFM shall provide the following limitations (excluding UAS):

(a) the approved Instrument Flight Rules (IFR) flight envelope, including the minimum and never-exceed speeds for instrument flight (V_{MINI} and V_{NEI});

(b) the IFR flight crew composition;

(c) the revised kinds of operation; and

(d) the steepest IFR precision approach gradient for which the helicopter is approved.

(3) **Maximum Allowable Wind.** For Category A rotorcraft, the maximum allowable wind for safe operation near the ground shall be furnished.

(4) **Limiting Height-speed Envelope.** For Category A rotorcraft, if a range of heights exists at any speed, including zero, within which it is not possible to make a safe landing following power failure, the range of heights and its variation with forward speed shall be established and furnished in the AFM, together with any other pertinent information, such as the kind of landing surface.

(5) **Take-off and Landing Surfaces.** The following information shall be furnished**:**

(a) the maximum allowable slopes for take-off and landing; and

(b) limitations applicable to elevated helipads, including vessels.

x. **Military-specific Configurations and Equipment.** For all aircraft, additional limitations in any military-specific configuration or with any installed military equipment shall be furnished, including, as applicable:

(1) **Stores.** Carriage and release of weapons or other stores including as a minimum:

(a) list of stores approved for carriage, including locations and combinations;

(b) flight envelope limitations for stores carriage and release;

(c) minimum release intervals, as applicable; and

(d) any other limitations identified during the stores clearance process.

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(2) **Ejection Seats:**

(a) occupant weight and size range; and

(b) safe ejection speed and height envelope.

(3) **Helmet-mounted Flight Crew Systems:**

(a) limitations on use as the primary source for flight data;

(b) limitations due to additional helmet weight or moment;

(c) for night vision imaging systems (NVIS), limiting cockpit lighting configuration; and

(d) changes to minimum flight crew, if applicable.

(4) **Provisions for Input to the Control of the Aircraft by Crew Members Other Than Flight Crew:**

(a) operating envelope within which such inputs are permitted; and

(b) flight crew monitoring requirements.

(5) **Special Purpose Operations.** Limitations for any authorized special purpose operations, including, but not limited to, those listed below shall be furnished, if applicable:

(a) intentional flight with one or more inoperative engines;

(b) maximum performance take-off and landing, including Short Take-off and Landing (STOL);

(c) tactical manoeuvres, including take-off, climb, nap-of-the-earth flight, descent, approach and landing;

(d) in-flight refuelling as tanker or receiver aircraft, including helicopter hover;

(e) ship-borne operations; and

(f) air-drop and external loads. Loading and flight envelope limitations associated with operations to drop, dispense, hoist, tow or sling personnel, cargo or other items (except stores) while in flight.

y. **Unmanned Aircraft Systems (UAS)**. The following limitations shall be furnished in the UAS AFM:

(1) Deployment limitations - all limitations induced by the deployment of the UCS, the command and control data link, the launch and landing elements and any ancillary systems.

(2) Communication system, and command and control data link limitations:

(a) limitations of the communication system and of the command and control data link;

(b) the effect of link loss on performance limitations; and

(c) the design operating frequencies of the communication system, and of the command and control data link.

(3) If the UCS is capable of operating more than one UA, the maximum number of UAs that can be safely controlled from the UCS.

(4) If the UA is capable of emitting radiation with potentially hazardous effects on fuel, ordinance and personnel, appropriate standoff distances.

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(5) For UAs equipped with a battery, environmental limitations and potential hazards associated with the battery.

(6) Limitations on flight performance imposed when the flight envelope protection system is enabled, if applicable. If flight with the flight envelope protection system disabled is applicable, any amended limitations shall also be furnished.

(7) Automatic Take-off and Landing (ATOL) system limitations, if applicable.

(8) Any restrictions on smoking in the UCS and in the vicinity of any UAS elements.

4. **Operating Procedures:**

a. **General.** Information concerning any normal, abnormal (if applicable) and emergency procedures, and other pertinent information necessary for safe operation and achievement of the scheduled aircraft performance shall be furnished in the AFM, including:

(1) **Take-off and Landing.** Take-off and landing procedures and associated airspeeds, including the kinds of surfaces for which the take-off and landing data are approved, shall be provided. For all aircraft, including multi-engine aircraft, where applicable, procedures, speeds and configuration(s) established during certification shall be furnished for:

(a) making a normal take-off and climb with all engines operating;

(b) abandoning take-off for any cause;

(c) making a normal approach and landing, and a transition to the balked landing condition;

(d) making an approach and landing with one engine inoperative;

(e) making a balked landing with one engine inoperative and the conditions under which a balked landing can be performed safely or a warning against attempting a balked landing;

(f) continuing a take-off following engine failure and the conditions under which take-off can safely be continued or a warning against attempting to continue the take-off; and

(g) continuing a climb following engine failure after take-off or enroute.

(2) **Handling.** An explanation of significant or unusual flight or ground handling characteristics.

(3) **Warning, Caution and Advisory System (WCAS).** The emergency procedures section of the AFM shall include a description of the WCAS, including a description of each WARNING, CAUTION and ADVISORY presented to the aircrew, and its meaning. All normal, abnormal and emergency procedures shall include relevant WCAS indications that are expected to accompany each condition. Required aircrew actions in response to each WARNING and CAUTION provided by the WCAS shall be furnished.

(4) **Fuel System Independence.** For multi-engine aircraft, information identifying each operating condition in which the fuel system independence is necessary for safety shall be furnished. Instructions shall be furnished for placing the fuel system in a configuration that achieves the required independence. Fuel system independence means allowing fuel to flow to each engine through a system that is independent of the fuel supply system and any other engine.

(5) **Battery Warning System.** For each aircraft equipped with a warning system to detect battery over-temperature or failure, the operating procedures for disconnecting the battery from its charging source shall be furnished.

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(6) **Usable Fuel Calibration.** Information shall be furnished that indicates that, when the fuel quantity indicator reads "zero" in level flight, any fuel remaining in the fuel tank cannot be used safely in flight.

(7) **Usable Fuel Quantity.** Information on the total quantity of useable fuel for each fuel tank, and the effect of a failure of any pump on the useable fuel quantity, shall be furnished.

(8) **Systems and Equipment.** Procedures for the safe operation of aircraft systems and equipment, both in normal use and in the event of any system or equipment malfunction, or known and clearly defined degraded modes for which flight crew actions/restrictions are appropriate, shall be furnished.

(9) **Engine Restarts.** Procedures for restarting any engine in flight, including the effects of altitude, shall be furnished.

(10) **Types of Surfaces and Contaminated Runways.** Procedures required, if any, for operations on surfaces that are contaminated or are other than smooth, dry, hard and level, shall be furnished.

(11) **Operations on Water.** For aircraft capable of operating on water, the applicable handling procedures and the demonstrated wave height shall be furnished.

(12) **Ditching.** If ditching or underwater egress is required for certification, associated procedures shall be furnished.

(13) **Extended Twin Engine Operations (ETOPS).** If applicable, flight operating procedures associated with the airborne equipment required for ETOPS shall be furnished.

(14) **Maintenance Test Flights.** Procedures and requirements for conducting maintenance test flights following maintenance of systems and components that cannot be fully verified as serviceable by inspection or testing on the ground shall be furnished.

b. **Fixed Wing Aircraft (Aeroplanes).** In addition to the information required in paragraph 4.a., the AFM shall furnish the following information for an aeroplane:

(1) **Crosswind.** The maximum demonstrated values of crosswind for take-off and landing, along with procedures and information pertinent to operations in crosswinds.

(2) **Buffet.** The buffet onset envelopes, if required for certification, shall be furnished. The buffet onset envelopes presented may reflect the centre of gravity at which the aeroplane is normally loaded during cruise if corrections for the effect of different centre of gravity locations are furnished.

(3) **Speed for Flight in Rough Air.** Unless buffet onset envelopes are required by certification, the recommended speed for flight in rough air shall be furnished. This speed must be chosen to protect against the occurrence of structural damage to the aeroplane and loss of control (e.g., stalling), as a result of gusts.

(4) **Spin Recovery.** If required for certification, the established spin recovery procedure shall be furnished.

(5) **Single Engine Aircraft - Gliding.** For all single-engine aeroplanes, the procedures, speeds and configuration(s) for a glide, and the subsequent forced landing following loss of thrust established during certification shall be furnished.

(6) **Multi-engine Aeroplanes.** In addition to the requirements for all aeroplanes, the following information shall be furnished for multi-engine aeroplanes:

(a) **Safe Single Engine (SSE) Speed.** If required for certification, the safe single engine speed (V_{SSE}) shall be furnished.

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ADVISORY NOTE

V_{SSE} is the minimum speed at which it is safe to perform intentional engine cuts for training purposes.

(b) **Engine Failure During Take-off.** If required for certification, the information shall include the procedures and speeds established during certification for:

i. carrying out an accelerate-stop; and

ii. continuing a take-off and following the flight path determined for safe flight following engine failure.

c. **Rotary Wing Aircraft (Helicopters).** In addition to the information required in paragraph 4.a., the flight manual shall furnish the following information for a helicopter:

(1) procedures to be followed and any associated minimum speeds in the event of an engine failure;

(2) for helicopters that have an established VNE (power-off), information to explain the VNE (power-off) and the procedures for reducing airspeed to not more than the VNE (power-off) following failure of all engines;

(3) for maximum weight, the airspeeds and corresponding rotor speeds for minimum rate of descent and best glide angle;

(4) if certification for instrument flight is requested, information required for proper operation of IFR systems and the recommended procedures in the event of stability augmentation or electrical system failures; and

(5) for helicopters certified for category A performance, the procedures to be followed if the critical engine fails during take-off or approach and landing, and required to achieve the Category A flight paths established during certification for:

(a) rejected or continued take-off; and

(b) rejected or continued approach and landing.

d. **Military-Specific Configurations and Equipment.** For all aircraft, additional procedures necessary for safe flight in any military-specific configuration or with any installed military equipment shall be furnished including, as applicable:

(1) **Stores.** Procedures for safe carriage, release and jettison of weapons or other stores.

(2) **Ejection Seats.** Procedures for strap-in, emergency ground egress and ejection.

(3) **Helmet-mounted Flight Crew Systems.** The following shall be furnished:

(a) procedures for verifying data with approved primary flight data, as applicable;

(b) normal, emergency and abnormal procedures, including any that are unique to a particular phase of flight; and

(c) for night vision imaging systems (NVIS), emergency and abnormal procedures in the event of NVIS or lighting failure or malfunction.

(4) **Provisions for Input to the Control of the Aircraft by Crew Members Other Than Flight Crew.** These shall include procedures for:

(a) transfer of control;

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(b) flight crew monitoring; and

(c) recovery from inappropriate inputs.

(5) **Special Purpose Operations.** Procedures associated with any authorized special purpose operations and necessary for safe flight.

(6) **Multi-engine Helicopters.** If intended usage includes significant exposure to hover operations from which continued flight in the event of an engine failure cannot be assured throughout the ranges of weight, altitude and temperature for which approval is requested, the AFM shall include procedures for transition from the hover to forward flight in the event of failure of one engine within the applicable performance envelope.

e. **Unmanned Aircraft Systems.**The following procedures shall be furnished in the UAS AFM:

(1) If the UCS is capable of operating more than one UA, the UAS AFM shall contain procedures for UA handover within the same UCS.

(2) A command and control data link loss (including intermittent) strategy and associated procedures.

(3) Procedures unique to ATOL, if applicable.

(4) Procedures describing how maximum capacity refuelling is to be accomplished with the requested mission loads.

5. **Performance Information:**

a. **General.** Unless otherwise prescribed, performance information shall be furnished for the weights, altitudes, temperatures, wind components, runway gradients and types of surfaces (including contaminated runways), as applicable, within the operational limits of the aircraft and shall contain, in each case, the conditions of power, configuration and speeds, and the procedures for handling the aircraft and any system having a significant effect on the performance information.

b. AFM performance information that exceeds any operating limitation shall be demonstrated only to the extent necessary for presentation clarity or to determine the effects of approved optional equipment or procedures. When data beyond operating limits are demonstrated, the limits shall be clearly indicated.

c. The AFM shall furnish:

(1) air data calibrations, including corrections to indicated values of airspeed, altitude and outside air temperature; and

(2) information to permit conversion of the indicated temperature to free air temperature, if other than a free air temperature indicator is used.

d. **Fixed Wing Aircraft (Aeroplanes).** The following information shall be furnished:

(1) The stalling speeds established during certification.

(2) The following performance information (determined by extrapolation and computed for the range of weights between the minimum landing weight and the maximum take-off weights):

(a) take-off run and distance with all engines operating;

(b) accelerate-stop distance;

(c) take-off climb rate and gradient with all engines operating and with one engine inoperative, as applicable;

(d) enroute climb with all engines operating and with one engine inoperative, as applicable;

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(e) climb in the landing configuration with all engines operating and with one engine inoperative, as applicable;

(f) climb in the approach configuration with all engines operating and with one engine inoperative, as applicable; and

(g) landing distance.

(3) An explanation of operational landing runway length factors included in the presentation of the landing distance, if appropriate.

(4) For single engine aircraft, the glide performance established during certification expressed as the maximum horizontal distance travelled in still air, in nautical miles per 1,000 feet of altitude lost in a glide at the speed necessary to achieve this with the engine inoperative, its propeller (if applicable) in the minimum drag position, and landing gear and wing flaps in the most favourable available position.

e. **Rotary Wing Aircraft (Helicopters).** The following information shall be furnished:

(1) For all helicopters, if certification for instrument flight is requested and if the instrument climb speed V_{YI} differs from the best rate of climb speed V_Y, the AFM shall provide climb performance at V_{YI} and with maximum continuous power throughout the ranges of weight, altitude and temperature for which approval is requested.

(2) **Helicopters Certified for Category A Performance.** The AFM shall contain a summary of the performance data, including data necessary for the application of any applicable operating rule together with descriptions of the conditions, such as airspeeds, under which these data were determined, and shall furnish:

(a) the indicated airspeeds corresponding with those determined for take-off;

(b) the techniques, associated airspeeds and rates of descent for autorotative landings;

(c) the normal and the rejected take-off distances established during certification;

(d) the one-engine inoperative (OEI) landing distance and OEI balked landing path established during certification and meeting the Category A flight path performance requirements;

(e) the OEI steady gradient of climb for each weight, altitude and temperature for which take-off data are to be scheduled, along the take-off path established during certification to meet required Category A flight path performance requirements; and

(f) out-of-ground-effect hover performance determined over the ranges of weight, altitude and temperature for which certification is requested with take-off power and the maximum safe wind demonstrated under the ambient conditions for data presented.

(3) **Helicopters Certified for Category B Performance.** The AFM shall furnish:

(a) the take-off distance and the climb out speed together with the pertinent information defining the flight path with respect to autorotative landing if an engine fails, including the calculated effects of altitude and temperature;

(b) the steady rates of climb and hovering ceiling, together with the corresponding airspeeds and other pertinent information, including the calculated effects of altitude and temperature;

(c) the landing distance, appropriate airspeed and type of landing surface, together with all pertinent information that might affect this distance, including the effects of weight, altitude and temperature;

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(d) the maximum safe wind for operation near the ground;

(e) the height-speed envelope, except for rotorcraft incorporating this as an operating limitation;

(f) glide distance as a function of altitude when autorotating at the speeds and conditions for minimum rate of descent and best glide angle at maximum weight;

(g) out-of-ground-effect hover performance determined over the ranges of weight, altitude and temperature for which certification is requested with take-off power and the maximum safe wind demonstrated under the ambient conditions for data presented; and

(h) any additional performance data necessary for the application of any operating rule.

f. **Military-Specific Configurations and Equipment.** For all aircraft, additional performance data in any military- specific configuration or with any installed military equipment shall be furnished, including, as applicable:

(1) performance data applicable to:

(a) intentional flight with one or more engines inoperative;

(b) maximum performance take-off and landing, including STOL;

(c) tactical manoeuvres;

(d) in-flight refuelling;

(e) ship-borne operations; and

(f) operations to drop, dispense, hoist, tow or sling personnel, cargo or other items (except stores) while in flight.

(2) effects or penalties arising due to carriage and release of weapons or other stores in all approved carriage combinations and flight conditions (e.g., icing); and

(3) for multi-engine helicopters, if intended usage includes significant exposure to hover operations from which continued flight in the event of an engine failure cannot be assured throughout the ranges of weight, altitude and temperature for which approval is requested, the AFM shall include performance data sufficient to enable determination of conditions under which safe flight may be continued with one engine inoperative when the applicable procedures are used.

g. **Unmanned Aircraft Systems.**

(1) Flight planning performance data shall be furnished in the UAS AFM.

(2) Flight performance with the flight envelope protection system enabled shall be provided. If applicable, flight performance with the flight envelope protection system disabled shall also be provided.

6. **Loading Information.**

a. The following loading information shall be provided:

(1) the weight and location of each item of equipment that can be easily removed, relocated or replaced, and that is installed when the aircraft was weighed, including any fixed ballast, unusable fuel and other replenishable fluids;

(2) sufficient loading instructions for each possible loading condition between the maximum and minimum weights to facilitate calculation of the aircraft weight and centre of gravity to ensure that they remain within the limits established during certification; and

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(3) the loading information required in this section, including the weight distribution limitations, shall be presented either in the AFM, or in a separate weight and balance control and loading document that is incorporated by reference in the AFM.

b. **Military-Specific Configurations and Equipment.** For all aircraft, the following additional loading data in any military-specific configuration or with any installed military equipment shall be furnished:

(1) loading data associated with the carriage of weapons or other stores in all approved carriage combinations; and

(2) loading data associated with operations to drop, hoist or sling cargo or personnel while in flight.

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PART 3
CONTINUING AIRWORTHINESS

CHAPTER 1 - CONDUCT AND CONTROL OF MAINTENANCE

SECTION 1

INTRODUCTION

3.1.1.1 Background

1. Maintenance activities include the technical and supporting administrative actions necessary to keep an aeronautical product, its associated systems, equipment, component parts, and software in a specified condition. Maintenance covers inspection, troubleshooting and fault isolation, repair, overhaul, calibration, testing, conditioning, modification incorporation, parts recertification, restoration, storage and reactivation, recovery or salvage of technical equipment, servicing and elementary work. In the wider sense, maintenance also covers the planning and scheduling, record-keeping and airworthiness documentation, quality control, activity control and configuration management activities required to support maintenance.

2. Within the Technical Airworthiness Program, maintenance activities are broken down as shown in Figure 3-1-1-1.

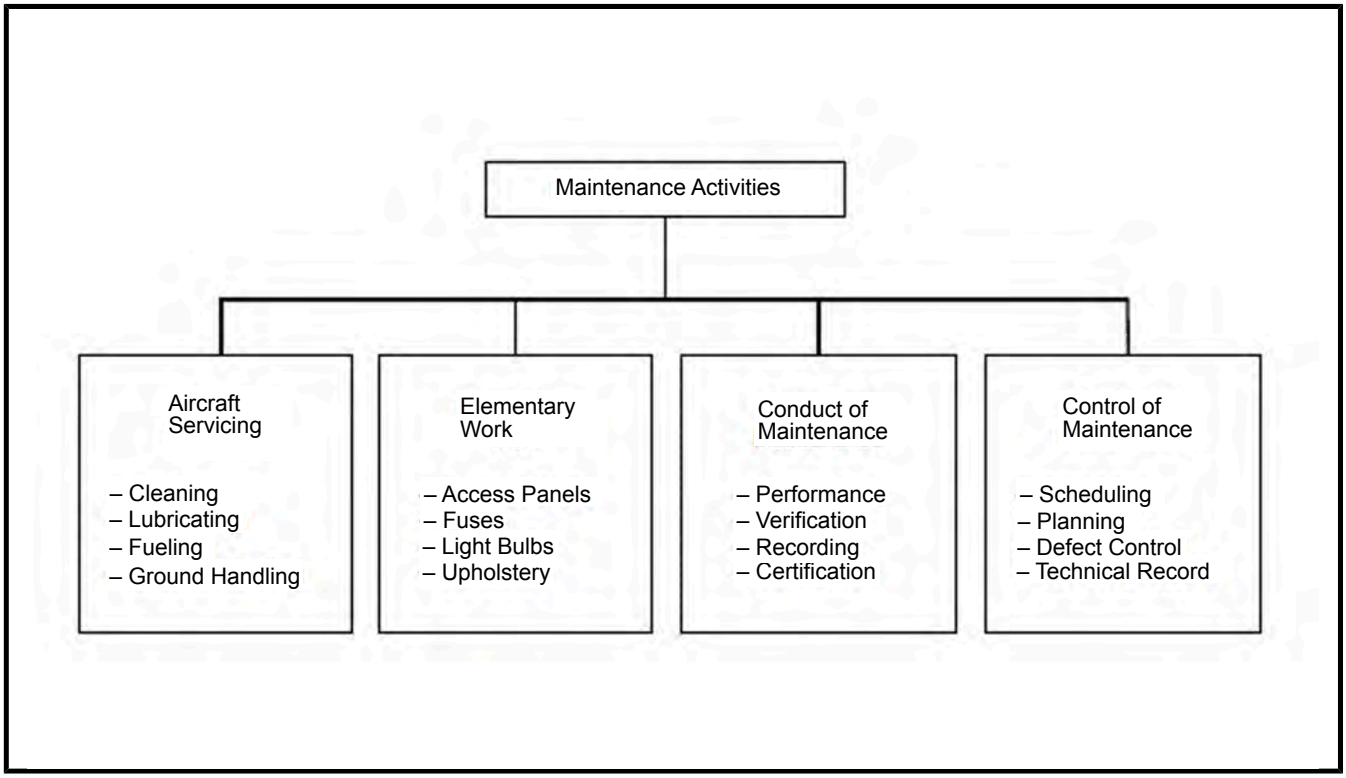

Figure 3-1-1-1 Maintenance Activities

3. Each of these maintenance activities has been defined within the Technical Airworthiness Program to ensure consistent application for all types of aeronautical products in-service. The extent of airworthiness regulation for

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each of these activities depends on its potential effects on the airworthiness of an aeronautical product. The following information provides guidance on these maintenance activities:

a. **Servicing**. Servicing in respect of an aeronautical product generally involves tasks that do not either require disassembly of the aeronautical product or affect airworthiness. The person who performs a servicing task must be authorized in accordance with the procedures specified by the applicable maintenance organization. The person who performs a servicing task must record completion of the task in the Technical Record for the aeronautical product, but the technical airworthiness function of maintenance release is not required. The technical airworthiness function of aircraft release is required following the completion of servicing on an aircraft prior to the release of the aircraft to operations. The servicing procedures for a specific aeronautical product are defined in the approved maintenance program for that product.

b. **Elementary Work.** Since elementary work involves simple work tasks that do not affect the airworthiness of an aeronautical product, they are treated in the same manner as servicing. The person who performs an elementary work task must be authorized in accordance with the procedures specified by the applicable maintenance organization. Furthermore, the person who performs an elementary work task must record completion of the task in the Technical Record for the aeronautical product but the technical airworthiness function of maintenance release is not required. The technical airworthiness function of aircraft release is required following the completion of elementary work on an aircraft prior to the release of the aircraft to operations. The elementary work tasks for a specific aeronautical product are defined in the approved maintenance program for that product.

c. **Conduct of Maintenance.** The conduct of maintenance includes the tasks to perform and verify the actual maintenance work on an aeronautical product. The conduct of maintenance can have a significant effect on the continuing airworthiness of an aeronautical product in operational service. The person who performs a maintenance task must be authorized in accordance with the procedures specified by the applicable maintenance organization. The technical airworthiness function of maintenance release is required following the completion of the performance of maintenance on an aeronautical product. Furthermore, an aircraft release is required following the completion of the performance of maintenance and prior to the release of an aircraft to operations. The minimum essential maintenance to assure the continued airworthiness of an aeronautical product is defined as the approved maintenance program during Type Certification in accordance with Part 2, Chapter 1.

d. **Control of Maintenance.** The control of maintenance involves the scheduling of maintenance, servicing and elementary work tasks within the time constraints specified in the approved maintenance program and other maintenance support activities that have an impact on airworthiness, such as defect deferral, empty weight and balance control and Technical Record maintenance. The control of maintenance can have a significant effect on the continuing airworthiness of an aeronautical product in operational service. The TAA will only assign airworthiness authority in accordance with Part 1, Chapter 4, to an organization for the conduct of maintenance, if the organization has clearly demonstrated that it has adequately addressed the control of maintenance requirements in the airworthiness control activities described in its process manual.

4. The Technical Airworthiness Program requires the conduct and control of maintenance of aeronautical products for which a DND type certificate has been issued and associated components to be accomplished:

a. by organizations acceptable to the TAA. This includes TAA-Acceptable Maintenance Organizations (AMO) and organizations recognized by the TAA, such as the OEM for the aeronautical product under specified conditions and a maintenance organization approved by another airworthiness regulatory agency;

b. in accordance with the approved maintenance program for the aeronautical product type which includes the preventive, corrective and contingency maintenance, elementary work and servicing; and

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c. in accordance with the maintenance control system of the organization which includes scheduling, deferral of defects and the control of maintenance release, aircraft release and aircraft empty weight and balance.

5. To assure that aeronautical products are airworthy following the conduct of maintenance, the Technical Airworthiness Program establishes rules for the performance of maintenance, the installation of parts, cannibalization of parts and parts substitution.

6. An important aspect of the program is the requirement for the verification of maintenance to ensure the correct and safe functioning of affected systems or equipment. This includes:

a. the inspection of work by the person who performed the maintenance task;

b. independent verification of a system or equipment that is critical to the safety of flight;

c. ground or bench testing when specified in the applicable maintenance manual; and

d. flight testing when specified in the applicable maintenance manual.

7. The recording of maintenance requires an entry to be made in the applicable Technical Record to establish the state of airworthiness of the aeronautical product and provide historical information on the servicing, elementary work and maintenance tasks which have been performed. The entry in the Technical Record includes the aeronautical product identification, work description, reference to the maintenance standard or procedure used, the date and the identity of the person who accomplished the task. The recording of maintenance is distinct from the certification of maintenance or maintenance release although both entries may be made by the same person if the person who performed the maintenance has been assigned maintenance release authority (MRA) within the maintenance organization.

8. Maintenance Release is an airworthiness certification after completion of a maintenance task certifying that the maintenance action was performed in accordance with the applicable maintenance manual in the approved maintenance program or the approved modification instruction. A Maintenance Release by a person who has been assigned MRA for the specific task on the particular aeronautical product type is required for all maintenance tasks except servicing and elementary work as specified in the approved maintenance program.

9. The final airworthiness-related requirement in the conduct of maintenance is the signing of an Aircraft Release prior to the release of an aircraft to operations following the completion of all maintenance, servicing and elementary work tasks. The purpose of the Aircraft Release is to ensure that only those aircraft that are considered airworthy are released to operations. This provides the basis upon which the pilot-in-command or aircraft captain determines the acceptability of the particular aircraft for the intended mission.

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SECTION 2

RULES AND STANDARDS

3.1.2.R1 Aeronautical Product Maintenance

1. The maintenance of an aeronautical product for which a DND Type Certificate has been issued and its associated systems, equipment, component parts and software shall be conducted:

a. by organizations acceptable to the TAA;

b. in accordance with the Approved Maintenance Program for the aeronautical product type, except as provided in 3.1.2.R1.2;

c. in accordance with specific direction issued by the Type Certificate Holder (TCH) for the aeronautical product type; and

d. in accordance with the maintenance control system of the organization.

2. The TCH for the aeronautical product type may authorize deviations from the Approved Maintenance Program when:

a. a maintenance organization submits a request to the TCH; and

b. it is demonstrated that the deviation will not affect airworthiness, in accordance with 3.1.2.S1.2.

ADVISORY NOTE

The TCH may establish contractual arrangements with Acceptable Technical or Acceptable Design Organizations to manage the engineering work associated with approving deviations to the Approved Maintenance Program. In these situations, the ATO/ADO scope and depth of authority approved by the TAA will include the approval of deviations from the Approved Maintenance Program, when requested by the TCH.

3.1.2.S1 Aeronautical Product Maintenance

1. The standards applicable to the conduct of maintenance for aeronautical products and associated systems, equipment, component parts, and software for which a DND Type Certificate has been issued are as follows:

a. organizations acceptable to the TAA for the conduct of maintenance include:

(1) a maintenance organization accredited by the TAA in accordance with 1.4.2.R1 for the specific aeronautical product type;

(2) a maintenance organization recognized by the TAA in accordance with 1.4.2.R1., provided the maintenance is performed in accordance with the Approved Maintenance Program applicable to the approved type design for the aeronautical product. Organizations recognized by the TAA for the maintenance of aeronautical products include:

(a) the Original Equipment Manufacturer (OEM) as described in 1.4.2.R1., for an aeronautical product for which the TAA has issued or intends to issue a DND Type Certificate;

(b) the Original Equipment Manufacturer (OEM) as described in 1.4.2.R1., for a part which is listed as a prime part number in the approved type design for an aeronautical product for which the TAA has issued or intends to issue a DND Type Certificate; and

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ADVISORY NOTE

Any alteration to a part number in an approved type design (i.e., use of a proprietary number or addition of a prefix or suffix) normally indicates that additional requirements exist regarding the use of the part. These additional requirements may have been introduced either during design approval of the aeronautical product or by a subsequent approved design change. Therefore, additional information must be obtained from the organization that altered the part number in the approved type design prior to maintenance of the part. The additional requirements may involve:

a. *modification of the part during manufacture or prior to use;*

b. *specific tolerances to be applied to the part; and*

c. *increased inspection and/or testing of the part.*

(c) a maintenance organization approved by a regulatory agency recognized by the TAA for the maintenance of the aeronautical product.

ADVISORY NOTE

Maintenance organizations accredited by another regulatory organization and recognized by the TAA include:

a. a TC-approved maintenance organization; and

b. a USFAA-approved repair station.

b. the contents of the Approved Maintenance Program for an aeronautical product, as described in Part 5, Chapter 3.

c. the Type Certificate Holder for the aeronautical product type may issue specific direction related to:

(1) modification implementation requirements;

(2) performance of special inspections or airworthiness directives; and

(3) deviations from the Approved Maintenance Program.

ADVISORY NOTES

1. *Deviations from the Approved Maintenance Program are defined as a limited, one-time change to the Approved Maintenance Program and may include part substitutions, shelf-life extensions, alternate maintenance procedures, extensions to the maintenance schedule,* temporary *repairs, deviations from the Minimum Equipment List or the deferral of rectifications.*

2. *The use of repair procedures that are not specified in the Approved Maintenance Program (non-standard repairs), and the incorporation of modifications which have not been issued by the Type Certificate Holder are design changes to the approved configurations as specified by the approved type design. Since the incorporation of design changes must be controlled for airworthiness and configuration management reasons, the Type Certificate Holder for a specific aeronautical product type may issue procedures for the development and subsequent use of non-standard repairs and modifications.*

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3. *For example, the Type Certificate Holder may specify that a maintenance organization may develop and incorporate non-standard repairs and/or modifications assessed as a* ***major design change*** *provided:*

   a. *the maintenance organization has been deemed Acceptable by the TAA to conduct airworthiness approval of design changes;*

   b. *the design change was developed in accordance with the design process in the TAA-approved process manual for the organization; and*

   c. *the design change was incorporated in* accordance with *the configuration management procedures issued by the Type Certificate Holder for the aeronautical product type, including provisions for TAC by the Type Certificate Holder.*

4. *Similarly, the Type Certificate Holder may specify that a maintenance organization may develop and incorporate non-standard repairs and/or modifications assessed as a* ***minor design change****, provided:*

   a. *the design change meets the criteria for assessment as minor as defined in Part 3, Chapter 2;*

   b. *the design change was developed in accordance with the design process in the TAA-approved process manual for the organization; and*

   c. *the design change was incorporated, in accordance with the configuration management procedures issued by the Type Certificate Holder for the aeronautical product type.*

5. *In addition, the configuration management procedures issued by the Type Certificate Holder may include provisions for the incorporation of temporary non-standard repairs and/or modifications for a specified period of time pending the TAC of the design change by the Type Certificate Holder.*

6. *When engineering directions such as Inspections, Non-Standard Repairs, Deviations from the Approved Maintenance Program, flight permits or other technical documents are transmitted to an AMO, they will be transmitted in accordance with the TAA-approved airworthiness policy manual for the organization providing the engineering direction. Where an e-mail is used to transmit an engineering direction, the formal released instruction will be enclosed. An e-mail by itself is not viewed by the TAA as a document that can approve data or instructions*

d. the maintenance control system of an organization shall include:

   (1) a process for scheduling the conduct of maintenance, elementary work and servicing which must be performed within the time constraints specified in the Approved Maintenance Program;

   (2) a process for scheduling the accomplishment of any technical direction issued by the Type Certificate Holder for the aeronautical product, such as Special Inspections, Modification Instructions and/or Airworthiness Directives as applicable for the aeronautical product type;

   (3) a process for the deferral of defects, in accordance with 3.1.2.R5;

ADVISORY NOTE

If an approved minimum equipment list (MEL) has been issued by the Type Certificate Holder for the aeronautical product, the process for the deferral of defects may be satisfied by reference to the MEL, provided a detailed description of the process is included within the preamble to the MEL.

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(4) a process for addressing recurring defects including:

(a) the methods used to detect and identify recurring defects while taking into account the methodology used in previous repair attempts; and

(b) reporting procedures, in accordance with 3.4.2.S1.

ADVISORY NOTES

1. *For the purposes of these standards, recurring defects occur where a failure mode is repeated three times, on a particular aircraft, within 15 flight segments of a previous repair made in respect of the particular failure mode.*

2. *The reporting procedures for recurring defects should describe the additional steps and release procedures required prior to the release of an aircraft. These steps should ensure that the ARA is informed that the recurring defect procedure has been satisfactorily completed, and that the aircraft may now be released. This procedure should also indicate when it is appropriate for SMM or TCH consultation.*

3. *The purpose of a recurring defect process is to identify problems that may be caused by faulty design, repairs, overhaul, inadequate or faulty maintenance instructions or failure to follow the approved maintenance instructions. Once recurring defects are identified, the process should then include investigation to determine the root cause and action to correct that cause.*

(5) a process for the control of maintenance release, in accordance with 3.1.2.R10;

(6) a process for the control of aircraft release, in accordance with 3.1.2.R11; and

ADVISORY NOTES

1. *The process for the control of aircraft release should include situations where an aircraft is deployed.*

2. *Civil Aviation uses the term "technical dispatch procedure" to refer to an aircraft release.*

(7) a process to ensure that the empty weight and balance of an aircraft is maintained in accordance with the Approved Maintenance Program for the aircraft type including:

(a) a means for establishing and monitoring the empty weight and balance for each individual aircraft;

ADVISORY NOTES

1. *the empty weight and balance shall be recorded in the Weight and Balance Report in accordance with the Technical Record procedures issued by the Type Certificate Holder for the aircraft type including the issue of a new Weight and Balance Report or the amendment of an existing Weight and Balance Report.*

2. *Weight and balance procedures applicable to most CAF organizations are specified in C-12-005-008/AM-000.*

(b) a means for the preparation and disposition of the necessary weight and balance forms prior to the signing of an aircraft release; and

(c) a means to ensure all personnel responsible for weight and balance control receive initial and annual weight and balance control system training.

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ADVISORY NOTES

1. *The weight and balance control system should be integrated into the operational procedures of the unit to ensure the transition from maintenance to operations complies with the weight and balance limits of the aircraft.*

2. *The intent of annual weight and balance control system training is to ensure that all personnel conducting weight and balance remain current. This training may only be required if a technician has not conducted weight and balance within a year and may be conducted as On-the-Job Training (OJT) during weighing of an aircraft. An AMO should clearly state these requirements in its MPM as an integral part of the update training, defined in 1.4.2.S1.5.j(2).*

3. *A loading schedule composed of graphs, tables, and computations and/or computer programs may be used to determine the weight and balance conditions of a loaded aircraft provided procedures are established for using the loading schedule.*

4. *A load manifest form may be used to document loading information by personnel responsible for weight and balance control provided procedures are established for its preparation.*

2. The standards applicable to the approval of a deviation to the Approved Maintenance Program are as follows:

   a. the Maintenance Organization requesting a deviation submits a formal request in accordance with their approved procedures;

   b. the TCH for an aeronautical product type may approve a deviation to an Approved Maintenance Program, provided:

      (1) it is within the scope and depth of the technical airworthiness authority assigned by the TAA;

      (2) the deviation procedure used to support this activity assesses risk using the risk management principles detailed in Part 5, Chapter 1; and

      (3) for deviations involving an Airworthiness Limitation (AWL), as described in Part 5, Chapter 3, MMEL repair interval category A, as described in Part 2, Chapter 6 and Airworthiness Directive (AD) time of compliance, as described in Part 5, Chapter 6 will be subject to a risk assessment in accordance with Part 5, Chapter 1. Regardless of the risk level assigned (ALOS or Higher), the TCH will notify the TAA (DTAES staff) when this action is taken and the reason it was required.

ADVISORY NOTES

1. *A deviation request that involves an AWL, when subject to a risk assessment, would normally be assessed as Low or higher since the certification process uses AWLs as one of the methods for establishing the certified level of safety for an aircraft.*

2. *Where the maintenance schedule does not clearly identify AWLs, CFTO C-12-XXX- 000/ NE-000 Part 1, Section 2, "Replacement Schedules Lifed Items" are considered airworthiness limitations.*

3. *There are occasions where, due to unique military requirements, a higher level of risk is deemed acceptable. This may result in the aircraft being maintained outside the normal maintenance program. Procedures for submission of requests for deviations for operational necessity for CAF military aircraft are provided in CFTO C-05-005-P09/AM-001, Part 9 and 1 Cdn Air Div Order 3-710.*

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c. the approved deviation to the maintenance program is communicated as a Specific Purpose Flight Permit (SPFP) and recorded in the Technical Record for the aeronautical product in accordance with Part 5, Chapter 5, including the following information:

(1) the validity period for the deviation in operating hours or calendar time as appropriate;

(2) any condition or inspection requirements needed to initiate the deviation;

(3) any condition or inspection requirements needed to maintain the deviation during the validity period; and

(4) the SPFP reference used by the AMO as authority for the deviation.

d. the TCH maintains a record of the approved deviation in the Organizational Record in accordance with Part 5, Chapter 5, including the information listed in 3.1.2.S1.2.c, and the identification of the aeronautical product by serial number to which the deviation applied.

3.1.2.R2 Performance of Maintenance

1. A person who performs maintenance on an aeronautical product shall ensure that the current approved methods, techniques, practices, parts, materials, tools, equipment, measuring device, test equipment and test apparatus specified in the Approved Maintenance Program for the aeronautical product are employed.

ADVISORY NOTE

An AMO's MPM should clearly describe the organization's eligibility criteria for the performance of maintenance. This should include the minimum training and qualifications required to ensure that technicians are able to carry out their responsibilities in accordance with 3.1.2.R2 and 3.1.2.S2, and that they are familiar with the maintenance control system described in 3.1.2.S1.1.d, which is in effect within the AMO.

3.1.2.S2 Performance of Maintenance

1. The Approved Maintenance Program for an aeronautical product provides the maintenance procedures, the associated aviation parts and materials and the necessary equipment and facilities to be used during the performance of maintenance to assure the continued airworthiness of an aeronautical product.

2. The performance of maintenance following any abnormal occurrence shall be in accordance with 3.1.2.R3.

3. Parts and material used in the performance of maintenance shall be in accordance with 3.1.2.R4, 3.1.2.R6, 3.1.2.R7 and/or 3.1.2.R12.

4. Any support equipment, measuring device, test equipment and test apparatus used in the performance of maintenance shall:

a. meet the specifications in the applicable maintenance manual of the Approved Maintenance Program with respect to accuracy, considering the intended use;

b. be calibrated in accordance with the calibration requirements published by the manufacturer of the measuring device, test equipment and test apparatus, and accompanied by an acceptable calibration certificate or record;

c. be calibrated by an organization who has a quality management system acceptable to the TAA as described in Part 1, Chapter 6, and whose calibration procedures are traceable to a national standard; and

d. be assessed, when the calibration certificate, record or report identifies that the measuring device, test equipment and/or test apparatus was found to be in an "Out of Tolerance" condition. In such case, the organization shall determine if any aeronautical products are affected and take appropriate action.

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5. The facilities used in the performance of maintenance shall:

a. meet the specifications in the applicable maintenance manual of the Approved Maintenance Program regarding lighting, heating and ventilation, considering the work to be performed. If the Approved Maintenance Program does not specify the required facilities and the work is to be performed on an aircraft, all maintenance, including the rectification of deferred defects, shall be performed in a hangar that is capable of completely enclosing the aircraft, where that work:

(1) involves an inspection where the interval is 12 months or greater;

(2) except where otherwise specified by the applicable maintenance manual for the aircraft type, involves the placing of the complete aircraft on jacks;

(3) requires the use of environmentally sensitive testing equipment, unless that equipment has been calibrated to take the environment into account; or

(4) involves the disassembly of components which would require lubrication upon re-assembly and could affect the safety of the aircraft if exposed to contaminants, such as dirt, water, sand and snow.

b. be suitable for the intended work requirements and any associated measuring device, test equipment and test apparatus necessary.

6. Equivalent facilities and equipment to those specified in the Approved Maintenance Program may be used if equivalence has been proven and the use is documented in the TAA-approved MPM for the organization where the maintenance is being performed.

ADVISORY NOTE

Notwithstanding these requirements, the federal or provincial regulations and standards may specify minimum requirements applicable to health and safety, fire protection and environmental protection in the work place.

3.1.2.R3 Abnormal Occurrence

1. Except as provided in 3.1.2.R3.2, an aeronautical product that has been subjected to any abnormal occurrence shall be inspected for damage in accordance with the Approved Maintenance Program.

ADVISORY NOTE

As described in Part 5, Chapter 3, an abnormal occurrence involves a situation where the design limits of an aeronautical product may have been exceeded during the operation of an aircraft outside the design operating limits or exposure to severe environmental conditions. Examples include overspeed, overtemperature and sudden stoppage. Anticipated abnormal occurrences that occur over the life-cycle of an aeronautical product are normally detailed in the Approved Maintenance Program and/or the approved operating instructions.

2. For abnormal occurrences not covered by the Approved Maintenance Program, the Type Certificate Holder for the aeronautical product type shall be consulted to obtain appropriate inspection and corrective action procedures.

3. The inspection for damage following an abnormal occurrence shall be performed by an authorized individual.

3.1.2.S3 Abnormal Occurrence

1. The person inspecting an aeronautical product to assess the circumstances of each abnormal occurrence shall decide on the appropriate course of action in accordance with the Approved Maintenance Program depending on the severity of the incident. If any doubt exists regarding the depth of inspection or the corrective action to be taken, the Type Certificate Holder for the aeronautical product type shall be consulted.

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2. Following any abnormal occurrence, an entry shall be recorded in the Technical Record for the aeronautical product in accordance with Part 5, Chapter 5, describing the event including the results of the inspection, the corrective action taken and where possible some indication of the relative severity of the incident.

ADVISORY NOTES

1. *If the abnormal occurrence inspection requirements contained in the Approved Maintenance Program are consistent with the guidelines for elementary work, a pilot may be authorized to perform and record the work provided the process is included in the TAA-approved MPM for the organization.*

2. *If in the opinion of the pilot-in-command or the person who certifies the aircraft release, the aircraft is not considered airworthy, or if the severity of the incident was such that even after a satisfactory first stage inspection doubt exists, then an authorized technician is required to inspect the aircraft and sign a maintenance release, before further flight.*

3.1.2.R4 Installation of Parts

1. No person shall install a part on an aeronautical product including an aircraft unless the part is inspected and certified as in conformance with the approved type design, in accordance with 3.1.2.S4.

ADVISORY NOTE

This rule applies to new parts, used parts, repaired parts including repaired and overhauled, standard parts, commercial parts, life limited parts and locally manufactured parts.

3.1.2.S4 Installation of Parts

1. Prior to installation on an aeronautical product, an aviation replacement part shall be inspected for the following:

a. a check for any obvious physical damage, including corrosion;

b. verifying that the appropriate plugs and caps are installed;

c. verifying that the part number (including dash numbers and letters) and model number of the part match the maintenance instructions in the Approved Maintenance Program for the aeronautical product; and

d. verifying that acceptable evidence to establish conformance to the approved type design, in accordance with 5.2.2.S1, has been supplied with the part.

ADVISORY NOTE

Organizations should have a process for serviceable items temporarily removed for access that controls and handles parts appropriately before reinstalling onto the same aeronautical product. This may include tagging parts or having controlled areas, such as shelves identifying the aircraft and serviceability status. It should also take into consideration storing electronic sensitive material, explosive devices and any other material that requires special handling.

2. An aviation replacement part that fails to meet any of the requirements of 3.1.2.S4.1. shall be considered an unapproved part and dealt with, in accordance with Part 5, Chapter 2.

ADVISORY NOTES

1. *Parts that do not meet the requirements of 3.1.2.S4.1., should be quarantined and reported to the TCH for disposition including recertification in accordance with 3.1.2.S13, or disposal in accordance with Part 4, Chapter 1.*

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2. *The provision of appropriate airworthiness certification documentation with each aeronautical product is an effective material control measure to assure that only approved parts are installed on an aircraft and its associated components. With the exception of life limited components, however, retention of the documentation is not essential from an airworthiness perspective after installation on an aircraft. In the civil aviation community, it is common practice to retain much of this documentation for the life of the aircraft or at least until the part is removed from the aircraft even though it is not a regulatory requirement. Refer to 5.2.2.S2.4, for more details on documentation retention. Some of the reasons for retention of documentation other than for airworthiness reasons include:*

   a. *increase the value of components for sale or disposal;*

   b. *ease the ability to register an aircraft with another civil aviation authority;*

   c. *aid in researching problems on a specific aircraft or fleet by providing information regarding the source of parts or repairs;*

   d. *facilitate location of problem parts;*

   e. *assist in the investigation of accidents; and*

   f. *ease the recertification of parts in the case of loss of documentation traceability.*

3. *The TCH must decide what documentation retention procedures will apply for a particular aircraft type.*

4. *Standard parts are common hardware type items, such as screws, bolts, and O-rings, and it is not feasible for airworthiness certification documentation to accompany the parts until the parts are installed on an aircraft. Therefore, it is important to adopt appropriate inventory control procedures to assure that only airworthy standard parts are available to aviation maintenance organizations. Practices to be considered include:*

   a. *procurement control;*

   b. *quality assurance provisions; and*

   c. *incoming inspections.*

3.1.2.R5 Deferral of Defects

1. The rectification of unserviceable equipment or the replacement of removed equipment may be deferred provided:

   a. the defect is assessed in accordance with the defect deferral process within the TAA-approved MPM for the organization in control and custody of the aircraft;

   b. the applicable conditions or limitations for the operation of the aircraft with the deferred defect have been determined and approved;

   c. the deferred defect with the applicable conditions or limitations does not result in a lower level of airworthiness than that specified for the original type design; and

   d. the appropriate entry is made in the Technical Record for the aircraft.

ADVISORY NOTES

1. *Deferred defects should not be used in situations where the deferred defect results in a lower level of aviation safety. These situations must be controlled through the use of Flight Permits, in accordance with Part 5, Chapter 7.*

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2. *Where a deviation to the Approved Maintenance Program is required to support the deferred defect, the provisions of 3.1.2.S1.2. apply.*

3.1.2.S5 Deferral of Defects

1. **Aircraft Type with TAA-approved MEL.** For an aircraft type where a minimum equipment list (MEL) has been approved by the TAA, the defect deferral process must ensure:

a. the aircraft is operated in accordance with any conditions or limitations specified in the MEL; and

b. a copy of the MEL is carried on board or available.

2. Where the conditions or limitations specified in the MEL are in conflict with a more restrictive operating limitation/restriction issued by the TCH, the direction of the TCH shall prevail.

3. Where the conditions or limitations specified in the MEL are in conflict with an airworthiness directive issued by the TAA or another airworthiness authority who has been deemed applicable for the aeronautical product, in accordance with Part 5, Chapter 6, the direction of the airworthiness directive shall prevail.

4. **Aircraft Type without TAA-approved MEL.** Where a MEL has not been approved in respect of an aircraft type, the defect deferral process must ensure:

a. the unserviceable or removed equipment is not required:

(1) by the approved operating instructions for the aircraft;

ADVISORY NOTE

The approved operating instructions for an aircraft are based on the TAA-approved Flight Manual and may be augmented with information from the Type Certificate Data Sheet (TCDS) and the Release to Operating Service Instructions for the aircraft type.

(2) to comply with CAF Flying Orders; such as equipment required for VFR or IFR flight as conditions for the intended mission warrant;

ADVISORY NOTE

CAF Flying Orders are contained in B-GA-100-001/AA-000. These orders specify, for example, equipment required for VFR or IFR flight as conditions for the intended mission warrant.

(3) DND/CAF airworthiness rules and orders; and

(4) any specific airworthiness directive issued by the AIA, OAA or TAA.

b. where there is a requirement to impose a limitation or condition on the aircraft to support a deferred defect, the following requirements apply:

(1) the AMO shall ensure their deferred defect procedure requires operational review and approval of imposed limitations and conditions; and

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ADVISORY NOTE

The requirement for operational review is required because the deferral of a defect may affect the design operating limitations of the aircraft as specified in the approved type design. Therefore, operating aspects of the approved type design such as handling characteristics, performance, operating envelope, systems functioning, etc. must be considered prior to approval of the deferral of the defect. Appropriate conditions or limitations that may restrict the operation of the aircraft with the deferred defect must be determined. For example, an aircraft with inoperative navigation lights that have been deferred should have a limitation that states the aircraft may be flown for day VFR missions only.

(2) the aircraft, if operated in accordance with the limitations or conditions, is no less airworthy than the original Certification Basis.

c. where the unserviceable equipment is not removed from the aircraft, it is isolated or secured so as not to constitute a hazard to any other aircraft system or to any person on board the aircraft;

d. all existing deferred defects are reviewed and the cumulative effects on the safe flight and landing of the aircraft are assessed with the addition of another deferred defect; and

e. the appropriate placards are installed as required.

5. **Technical Record Entry.** An authorized individual shall make an entry in the applicable Technical Record for the affected aircraft consisting of the following information as applicable:

a. details of the equipment unserviceability or removal;

b. reference to the appropriate section of the MEL and/or details of the actions taken, including isolation and/or securing of equipment and installation of placards; and

c. details of any conditions or limitations that apply to operation of the aircraft with the deferred defect.

ADVISORY NOTES

1. *Normally, a person should not be authorized to defer a defect unless authorized ACA for the affected equipment or system. An AMO can establish policy and procedures that involve a remote ACA deferral of defects as long as the requirements of 3.1.2.S5, are met.*

2. *Although the responsibility for deciding whether an aircraft may be operated with deferred defects rests with the pilot-in-command, an essential criterion for acceptability as a TAA-Acceptable Maintenance Organization is a formal maintenance control system as described in 3.1.2.S1.1.d. This system must provide a high degree of confidence that the airworthiness effects of all maintenance tasks including deferred defects have been assessed by an authorized technician.*

3. *A pilot who reviews and accepts an aircraft with deferred defects assessed in accordance with the maintenance control system of a TAA-Acceptable Maintenance Organization, has exercised due diligence with respect to the airworthiness of the aircraft. Whereas, a pilot who accepts an aircraft with deferred defects which have not been assessed by an authorized technician in accordance with the maintenance control system is not exercising due diligence. The final decision, however, rests with the pilot.*

3.1.2.R6 Robbing

1. An airworthy aviation part removed from one aeronautical product for use on another aeronautical product only continues to be airworthy if it is installed immediately upon removal.

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ADVISORY NOTE

The intent of this rule is to ensure that parts are not left unattended or unprotected for prolonged periods, thereby making it impossible for a technician to ensure that only serviceable parts are being installed. An AMO should define in its MPM what it considers to be "immediately" in regard to this rule. An AMO should also define what maintenance action is required to protect a part that is not installed within its definition of immediately. This maintenance may be as little as installing protective caps and tagging the part. It may be acceptable, for instance, for an AMO to have a policy that states that a robbed part will continue to be considered airworthy if it is installed within the same shift, or by the same technician that removed the part, provided that the part has not been left unattended without protective caps and plugs installed. This policy may vary widely between AMOs. It is the AMO's responsibility to ensure that its policy meets the intent of this rule.

2. Parts removed from a damaged or crashed aircraft or a component which may have been involved in an abnormal occurrence, as defined in Part 5, Chapter 3, are not considered airworthy unless the part has been recertified in accordance with 3.1.2.R13.

ADVISORY NOTE

The removal of parts, as stipulated in 3.1.2.R6.2, is sometimes referred to as cannibalization. Depending on the circumstances involved and the extent of damage or severity of the occurrence, the Type Certificate Holder for the aircraft type involved must determine the scope and depth of maintenance that is required on an individual component basis to ensure the parts are fit and safe for use on the aircraft type.

3.1.2.S6 Robbing

1. When a part is transferred from one aeronautical product to another, the documentation on both the part and the receiving aeronautical product shall indicate the aeronautical product from which the part has been removed.

2. Parts removed, which will not immediately be installed on another aeronautical product, shall be subjected to maintenance and have an appropriate airworthiness certification, such as a maintenance release provided prior to use in the future.

3. Parts removed from an aeronautical product that has not followed the approved maintenance schedule may require additional inspection prior to installation and use.

ADVISORY NOTE

1. *When parts are removed from an aeronautical product in long term storage or an aeronautical product that has been designated as a rob resource, particular attention must be paid to parts which may be subject to degradation over time. Parts with seals that may dry out or bearings that should be rotated may require maintenance prior to their installation on another aircraft. In these circumstances, the AMO must have a process in their MPM to engage the TCH for recertification requirements.*

2. *When parts are removed from a simulator that is not maintained under the same maintenance program as the aircraft or is not maintained by a TAA-Acceptable Organization, the AMO must have a process in their MPM to engage the TCH for recertification requirements.*

3. *Parts robbed from an aeronautical product are subject to verification, inspection and documentation requirements of 3.1.2.S4.1.*

3.1.2.R7 Parts Substitution

1. Substitute parts acceptable to the TAA may be used as aviation replacement parts for installation on an aeronautical product.

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ADVISORY NOTE

Parts substitution involves the use of a part with suitable characteristics to replace the one listed in the approved type design for an aeronautical product but is not specified as an authorized alternative. Usually, substitution applies to piece parts but could also apply to non-repairable assemblies that are treated as piece parts. The substitution process applies when the two parts are interchangeable without a change to the approved type design, change to the Approved Maintenance Program, or modification of the part or the aeronautical product on which it will be installed. Parts substitution is a one time use of the replacement part. Any situation that requires either a modification to install the proposed substitute part, a change in the maintenance schedule/ procedures or ongoing use of the proposed substitute part will require a formal design change. Refer to Part 3, Chapter 2, of the TAM, for more information on design change certification requirements.

3.1.2.S7 Parts Substitution

1. Substitute parts shall be considered acceptable to the TAA provided they meet the following criteria:

   a. the form, fit and function characteristics are identical or similar, but suitable;

   b. the specifications for the two items have minimal variations;

   c. the substitute was selected by an authorized individual in accordance with the Airworthiness Process Manual (APM) of an organization deemed Acceptable by the TAA;

   d. the APM of the organization contains a process for recording the substitution in the technical record; and

   e. the airworthiness category of the substitution has been assessed as minor by an authorized individual in accordance with the APM of an organization deemed Acceptable by the TAA.

ADVISORY NOTE

A proposed substitute part which does not meet the criteria of 3.1.2.S7.1, should be referred to the TCH for the aeronautical product type.

3.1.2.R8 Verification of Maintenance

1. Verification of maintenance including inspection of the work performed, independent verification, ground testing, flight testing and weight and balance check to ensure correct and safe functioning of affected systems or equipment shall be conducted as follows:

   a. The person who conducts maintenance on an aeronautical product shall inspect his or her work in accordance with the standard in 3.1.2.S8.1.a, upon completion of a maintenance task;

   b. Ground or bench testing in accordance with the standard in 3.1.2.S8.1.b, shall be conducted following maintenance on an aeronautical product when specified in the applicable maintenance manual of the Approved Maintenance Program for the aircraft or when the inspection conducted as per 3.1.2.R8.1.a, does not ensure correct and safe functioning of the affected systems or equipment;

   c. Independent verification of maintenance in accordance with the standard in 3.1.2.S8.1.c., shall be conducted when specified in the applicable maintenance manual of the Approved Maintenance Program for the aircraft or when the item or system on which maintenance was conducted is considered critical to the safety of flight;

   d. Flight testing in accordance with the standard in 3.1.2.S8.1.d., shall be conducted following maintenance on an aeronautical product when specified in the applicable maintenance manual of the Approved Maintenance Program for the aircraft or when the inspection, ground/bench testing and/or independent verification conducted as per 3.1.2.R8.1.a to 3.1.2.R8.1.c, does not ensure correct and safe functioning of the affected systems or equipment; and

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e. A weight and balance check in accordance with the standard in 3.1.2.S8.1.e, shall be conducted following maintenance on an aeronautical product when specified in the applicable maintenance manual of the Approved Maintenance Program for the aircraft type or at least once every five years.

3.1.2.S8 Verification of Maintenance

1. The standards applicable to the verification of maintenance are as follows:

a. **Inspection.** The inspection of maintenance shall be conducted as specified in the applicable maintenance manual of the Approved Maintenance Program for the aeronautical product and as a minimum the inspection shall ensure:

(1) all items are correctly assembled, installed, secured and safety locked in accordance with the Approved Maintenance Program;

(2) all controls and associated systems that were worked upon, or that may have been affected by maintenance, operate with full and free movement;

(3) all controls, linkages and applicable indicators that were worked upon, or that may have been affected by maintenance, respond correctly when controls are moved;

(4) all installed parts are approved parts;

(5) all appropriate entries have been made in the Technical Record; and

(6) no foreign objects including tools were left in the area during the conduct of maintenance which could result in Foreign Object Damage (FOD).

ADVISORY NOTES

1. *Verification as described in 3.1.2.S8.1.a, is the responsibility of the person who performs the maintenance and is to be carried out following every maintenance action.*

2. *Additional information regarding programs which are applicable to DND units and organizations for the prevention of foreign objects is provided in C-05-005-021/AM-000* Tool Control System *and C-05-040-004/TS-002* Safety Precautions and Accident Prevention of Foreign Object Damage to Aircraft and Aero-engines.

3. *For non-DND organizations, the organization's APM should address the prevention of foreign object damage during the conduct of maintenance.*

b. **Ground Testing.** Ground testing shall be conducted by authorized personnel and in accordance with the applicable maintenance manual specified in the Approved Maintenance Program for the Aeronautical Product;

ADVISORY NOTE

1. *Ground testing, which involves the ground run-up of engines by maintenance personnel, requires strict adherence to safety precautions and practices as stated in the applicable maintenance manual specified in the Approved Maintenance Program for the Aeronautical Product. Maintenance personnel performing ground run-up of engines must ensure that the aircraft is fit and safe for the intended ground test. CFTO C-05-005-P10/AM-001 provides guidance for the development of safe procedures for CAF military organizations.*

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2. *There are some ground test tasks that may be safely completed once the aircraft is in the custody of a pilot-in-command or aircraft captain (e.g., a pre-flight leak check or a functional check). The pilot-in-command or aircraft captain may accept the aircraft with these outstanding tasks recorded in the technical record and proceed with flight operations only when the results of the task are satisfactory and the technical record is certified to that effect by an authorized person.*

c. **Independent Verification.** An independent verification shall be conducted by authorized personnel who have not been employed in any manner in rectifying the condition that initiated the requirement. An AMO's MPM shall specify the eligibility criteria for persons to conduct independent verification. Independent verification shall be performed in accordance with the applicable maintenance manual specified in the Approved Maintenance Program for the aeronautical product and the following requirements:

ADVISORY NOTES

1. *An independent verification is interpreted as a quality control check over and above the normal requirements to clear maintenance whenever an engine or flight control system is disturbed. In this context "disturbed" means actual disconnection, adjustment or disruption of the system itself. It does not include adjustment of travel stops. Simple adjustments of this kind do not require an independent verification.*

2. *An independent verification should be considered to be a sub-task of the maintenance being carried out. As such, the independent verification should be completed and signed prior to maintenance release.*

3. *An AMO's MPM should clearly state the organization's minimum training and qualification requirements for the conduct of independent verification. Normally, independent verification will be accomplished by a technician who is authorized by the ACA for the affected system, or has superior knowledge of the system and is acceptable to the PRAA.*

4. *The independent verification may require reviewing the maintenance action to ensure proper assembly of components.*

(1) Items which shall be subject to an independent verification because they are considered critical to the safety of flight are:

ADVISORY NOTE

The requirements for mandatory Independent Verifications on an aeronautical product are normally specified in the Approved Maintenance Program for the aeronautical product type such as the ECIR for some CAF military aircraft types.

(a) Flight Controls:

i. main control surfaces, rudder, elevators, ailerons, flaps, flaperons, spoilers, dive brakes, and trim tabs on fixed wing aircraft; and

ii. cyclic, collective and directional control systems on rotary wing aircraft.

(b) Engines, propellers, rotors, transmission and associated drives; and

(c) Control Mechanisms:

i. all cables, drive shafts and control rods that operate 3.1.2.S8.1.c(1)(a) or 3.1.2.S8.1.c(1)(b); and

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ii. controls in the cockpit and any necessary linkages, such as electronic, electromechanical, or hydraulic mechanisms that actuate or provide input to the flight controls or power plant or power trains.

ADVISORY NOTE

Linkages include all wiring and interconnection appliances and devices that provide input to the control and actuation of flight control surfaces and propulsion systems (e.g. electric/fibre optic (Fly-By-Wire) and electrical connectors).

(2) Independent verifications shall be conducted as follows:

(a) Flight Controls:

i. ensure items are correctly assembled, installed, secured, and safety locked;

ii. ensure that all flight controls and associated systems that were worked upon, or that may have been affected by maintenance, operate with full and free movement; and

ADVISORY NOTE

Particular attention is to be paid to the installation of trim tab actuators to guard against an inadvertent reversing of aerodynamic effect.

iii. ensure control surface and applicable indicators respond correctly when cockpit controls are moved.

(b) Engines, propellers, rotors, transmissions and drives:

i. ensure items are correctly assembled, installed, secured, and safety locked;

ii. ensure that all engine, propeller, rotor, transmission and/or drive controls and associated systems that were worked upon, or that may have been affected by maintenance, operate with full and free movement; and

iii. ensure all items and applicable indicators respond correctly when cockpit controls are moved.

(c) Control Mechanisms:

i. ensure items are assembled correctly, installed, secured, and safety locked;

ii. ensure that all controls and associated systems that were worked upon, or that may have been affected by maintenance, operate with full and free movement; and

iii. ensure all components and applicable indicators respond correctly when cockpit controls are moved.

d. **Flight Testing.** Flight testing shall be accomplished in accordance with the procedures detailed in the approved operating instructions for the aircraft type (that is, the Aircraft Operating Instructions (AOI) for CAF military aircraft types) and the requirements specified in the Maintenance Process Manual (MPM) for the organization either as a maintenance flight test or a flight functional depending on the criticality of the item or system on which maintenance was conducted as follows:

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ADVISORY NOTE

For CAF aircraft types, maintenance flight test requirements are specified in C-05-020-007/ AM-000 - Flight Test Orders for the Canadian Forces.

(1) if the item or system is critical to the safety of flight of the aircraft, the flight testing shall be conducted as a dedicated maintenance flight test; and

ADVISORY NOTES

1. *The requirement for mandatory maintenance flight tests are specified in the Approved Maintenance Program for the aircraft type (i.e., ECIR for CAF aircraft types).*

2. *A maintenance flight test may either be a **Full Card,** where all elements of the maintenance flight test procedure in the AOI are conducted, or a **Partial Card,** where only the applicable elements of the maintenance flight test procedure in the AOI are accomplished.*

3. *A **dedicated flight** means that the aircraft must land following completion of the flight testing for the pilot to complete the entry required in accordance with 3.1.2.R10.5, prior to the aircraft being used on an operational mission or task. Refer to 3.1.2.R10, Certification of Maintenance for additional details on the maintenance release.*

4. *In accordance with B-GA-100-001/AA-000, passengers shall not be carried in the aircraft during a maintenance flight test.*

(2) If the item or system is not critical to the safety of flight of the aircraft the flight testing shall be conducted as a flight functional which may be accomplished on a non-interference opportunity basis with an operational mission.

ADVISORY NOTE

A flight functional may use either the elements of the maintenance flight test procedure in the AOI or an operational procedure in the AOI.

e. **Weight and Balance.** The standards applicable to weight and balance for an aircraft are as follows:

(1) the empty weight and balance for an aircraft shall be updated following maintenance when required by the TAA- Approved Maintenance Program or when the maintenance performed may impact the existing empty weight of the aircraft;

ADVISORY NOTES

1. *A modification leaflet generally requires a weight and balance to be accomplished when there is an expectation that the cumulative change in operating weight will exceed plus or minus one-half of one percent of the gross weight or the cumulative change in the centre of gravity position will exceed:*

   a. *one half of one percent of the mean aerodynamic chord for fixed wing aircraft; or*

   b. *one half of the total C of G range for rotary wing aircraft.*

2. *Further details regarding the weight and balance check, are provided in Part 5, Chapter 3, and weight and balance control system in 3.1.2.S1.1.d(7).*

3. *Further information regarding the recording requirements for weight and balance is provided in 5.5.2.S2.*

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3.1.2.R9 Recording of Servicing, Elementary Work and Maintenance

1. A person who performs servicing, elementary work and/or maintenance on an aeronautical product shall ensure that the details required by the standards in this part of the TAM are entered into the applicable Technical Record for the aeronautical product, in respect of the task performed.

2. A person who performs servicing, elementary work and/or maintenance on an aeronautical product shall ensure the Technical Record for the aeronautical product is accurate with respect to any outstanding elements of the task performed.

3.1.2.S9 Recording of Servicing, Elementary Work and Maintenance

1. A person who performs servicing, elementary work and/or maintenance on an aeronautical product shall ensure that the following information is recorded in the applicable Technical Record for the aeronautical product:

ADVISORY NOTE

Compliance with this requirement is the responsibility of the person actually performing the work. It involves recording an entry into the applicable Technical Record. This entry of work performed is distinct from the certification of maintenance or maintenance release addressed by 3.1.2.R10

a. product identification (aircraft registration marking, nomenclature, type/model number, name of manufacturer, part number and serial number), unless the entry is recorded in a Technical Record that contains this information;

b. a brief description of the work performed;

c. reference to the standard or procedure used in the performance of the work;

ADVISORY NOTES

1. *The standard quoted in the technical record is required to provide a direct link to the work performed. It is not acceptable to provide a general reference to an entire technical order.*

2. *In cases where damage is being assessed, the extent of the damage and the associated reference to the limitations as specified in the applicable maintenance manual of the Approved Maintenance Program shall be referenced.*

d. the date the work was performed and the identification of the person who accomplished the work;

e. if a repair is accomplished that involves making and installing repair parts during the performance of maintenance, a statement to that effect;

f. if a defect is found during the performance of a task, a general description of the defect, including the specific location; and

g. the final torque values applied, critical measurements and test results obtained, when specified in the maintenance instructions, including the recording of the identification number of the calibrated tool that was used.

ADVISORY NOTES

1. *Where a maintenance task requires multiple applications/measurements of the same value (i.e., torque, voltage, resistance, etc.), it is acceptable to have a single entry capturing the torque applied, or the highest value obtained by the measuring device or test equipment.*

2. *Where a maintenance task requires the application of different torques, each final torque value shall be recorded.*

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3. *Values and test results specified in the maintenance instructions are considered critical when obtained with a calibrated tool, measuring device or test equipment.*

4. *When following standard practices, not specifically identified in the maintenance instruction associated with the maintenance being performed, neither the requirements to record the calibrated tool, measuring device or test equipment, nor the final value are mandatory.*

2. Where a task is partially completed, the person who performed the task shall ensure that a general description of any outstanding work, including the specific location of any parts/systems that have been disturbed, is to be recorded.

ADVISORY NOTE

Where the open work lists, inspection sheets or job cards used to accomplish the work clearly indicate any outstanding work, these are acceptable means for meeting this requirement.

3.1.2.R10 Certification of Maintenance

1. Airworthiness certification following the performance of maintenance shall be conducted by the signing of a maintenance release.

2. No person shall sign a maintenance release, or allow anyone whom the person supervises, to sign a maintenance release, unless the maintenance was performed in compliance with the applicable maintenance manual specified in the Approved Maintenance Program and the maintenance release meets the applicable requirements specified in this Part.

3. No person shall sign a maintenance release, or allow anyone whom the person supervises, to sign a maintenance release, unless the person signing the release is specifically authorized for the particular maintenance task performed by a maintenance organization acceptable to the TAA.

4. Where a maintenance release pursuant to 3.1.2.S10 is conditional on the satisfactory completion of a maintenance flight test, the aircraft may be operated for the purpose of the flight test.

5. Following a maintenance flight test conducted pursuant to 3.1.2.S10, the pilot-in-command shall enter the results of the flight test in the Technical Record, and where the entry indicates that the results of the flight test are satisfactory, that entry completes the maintenance release required by 3.1.2.S10.

3.1.2.S10 Certification of Maintenance

1. **Maintenance Release.** A maintenance release is the airworthiness certification conducted after the completion of a maintenance task such as a repair, inspection or modification to an aeronautical product certifying that the maintenance action was performed in accordance with the applicable maintenance manual specified in the Approved Maintenance Program or the approved modification instruction as applicable. The standards applicable to a maintenance release are as follows:

a. A maintenance release is required for all maintenance tasks except servicing and elementary work, as defined in Part 5, Chapter 3;

ADVISORY NOTES

1. *Servicing and elementary work, as defined in Part 5, Chapter 3, are tasks which do not have a direct impact on airworthiness. These tasks, such as cleaning, lubrication, repair of tertiary fairings, replacement of fuses and light bulbs, repair of cabin furnishings and other elementary work approved by the Type Certificate Holder are specified in the Approved Maintenance Program for the aeronautical product involved.*

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2. *Although servicing and elementary work do not require a maintenance release as specified in 3.1.2.S10.1.a, all other rules for the conduct of maintenance as specified in this chapter apply, such as the recording of work and the authorization of personnel to perform work. In this regard, the Senior Maintenance Manager in an Acceptable Maintenance Organization is responsible for the control of the authorization of personnel to perform servicing and elementary work. An AMO's MPM should clearly state the organizations minimum training and qualification requirements for the conduct of servicing and elementary work, in accordance with 1.4.2C.2.e.(1).*

b. A maintenance release applies only to the particular maintenance task or tasks to which it relates. Therefore:

(1) it is acceptable to sign a maintenance release in respect of a single task or group of tasks, even if other work is outstanding on the aircraft, provided that the wording of the entry leaves no doubt as to the scope of work being certified; and

ADVISORY NOTE

For an outstanding independent verification, 3.1.2.S10.1.b(1), does not apply. When an independent verification is a requirement of a maintenance task, it shall be completed and certified prior to a maintenance release being signed, unless a suitable procedure is in place to ensure that the aircraft cannot be released until independent verification occurs. Certification of an independent verification attests only to the satisfactory completion of a quality control check. The person signing the maintenance release assumes full responsibility for the satisfactory completion of the task.

(2) it is the responsibility of the person signing a maintenance release to ensure that the Technical Record is correct in respect of the status of any other outstanding task.

c. Each maintenance release must include the following information:

(1) product identification (aircraft registration marking, nomenclature, type/model number, name of manufacturer, part number and serial number), unless the release is being made in an established Technical Record that contains this type of information;

(2) a brief description of the work performed including applicable reference data, the work order number and the date the work was performed; and

(3) the identification of both the signatory and the Acceptable Maintenance Organization.

d. The maintenance release for the direct installation of a part which was removed from an airworthy aircraft shall contain a statement indicating the aircraft from which it was removed.

2. **Maintenance Release Authority (MRA).** No person shall certify a maintenance release unless that person has been granted Maintenance Release Authority, in accordance with Part 1, Chapter 4 (Annex C of Section 2).

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ADVISORY NOTES

1. *Part 1, Chapter 4 (Annex C of Section 2), defines two types of Maintenance Release Authorities as follows:*

   a. ***Aircraft Certification Authority (ACA)****- a person is authorized to sign a maintenance release in respect of work performed on an aircraft.*

   b. ***Shop Certification Authority (SCA)****- a person is authorized to sign a maintenance release in respect of work performed on an aeronautical product while not installed on an aircraft.*

2. *A SCA is intended for work performed on aircraft parts in the controlled environment of a shop where integration with other aircraft systems is not a primary concern since these aspects will be dealt with during installation of the part in the aircraft. Generally, a SCA will be limited to specific parts which are maintained in a particular shop and the scope and depth of knowledge of the aircraft is not as great as that required for ACA.*

3. *Part 1, Chapter 4 (Annex C of Section 2), has provisions for Restricted Certification Authority to deal with unusual or extenuating circumstances when a person with a valid ACA or SCA is not available.*

4. *The rules and standards in Part 1, Chapter 4, provide specific criteria for personnel who can sign a maintenance release. The person who has custody and control of an aircraft is responsible for ensuring that only personnel meeting those qualifications sign a maintenance release for aircraft, engines, propeller or other installed components.*

3. **Maintenance Release Authority Responsibilities.** A person who conducts maintenance release certifies that:

   a. the maintenance task and all associated sub-tasks were completed in accordance with:

      (1) the Approved Maintenance Program; or

      (2) specific direction issued by the TCH, as per 3.1.2.S1.1.c.

   b. no outstanding work remains or an appropriate entry has been recorded in the applicable Technical Record for any remaining work;

   c. any recurring defects have been reported, in accordance with 3.1.2.S1.1.d(4);

   d. all required verification of maintenance has been carried out, in accordance with 3.1.2.R8; and

   e. the entries in the Technical Record relating to the work performed are correct.

4. A maintenance release shall include the following, or a similarly worded statement:

"The described maintenance has been performed in accordance with the applicable airworthiness requirements."

ADVISORY NOTES

1. *The intent of the term "similarly worded statement" is to provide flexibility for organizations who may prefer somewhat different wording and account for an error in wording which will not invalidate the release.*

2. *One means of compliance to this standard is to have this statement pre-printed on the maintenance release form directly above the maintenance release signature.*

5. Where a maintenance release is signed by a person in respect of work performed by another person who is not authorized to sign the maintenance release, the person signing the maintenance release must personally

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observe the work to the extent necessary to ensure that it is performed in compliance with the requirements of the applicable maintenance manual specified in the Approved Maintenance Program and any applicable standards of airworthiness, and specifically, the requirements of 3.1.2.S2, for the performance of maintenance.

6. Where a person signs a maintenance release in respect of maintenance performed on an aircraft, the satisfactory completion of which cannot be verified by inspection or testing of the aircraft on the ground, the maintenance release shall be made conditional on the satisfactory completion of a maintenance flight test, by the inclusion of the phrase "subject to satisfactory maintenance flight test". Upon completion of the maintenance flight test, the pilot shall complete the entry, by the inclusion of the phrase "Test flown satisfactory" or "Test flown unsatisfactory" as appropriate.

ADVISORY NOTE

Refer to 3.1.2.R8.1.d, and associated standard for additional information on maintenance flight tests.

3.1.2.R11 Aircraft Certification

1. An aircraft in the control and custody of a maintenance organization shall be released to operational missions/taskings following the performance of servicing, elementary work and/or maintenance by the signing of an aircraft release.

2. No person shall sign an aircraft release or permit anyone whom the person supervises to sign an aircraft release, unless the person signing the release has been assigned Aircraft Release Authority, in accordance with Part 1, Chapter 4, by the maintenance organization that has control and custody of the aircraft**.**

3. No person shall sign an aircraft release, unless the aircraft equipment required by the approved type design is serviceable, except as otherwise provided in 3.1.2.R5 and 3.1.2.S5.

4. A person who has been assigned Aircraft Release Authority may sign an aircraft release for an aircraft that has equipment that is not serviceable or from which equipment has been removed where the aircraft is operated in accordance with the conditions of a flight permit that has been issued specifically for that purpose.

3.1.2.S11 Aircraft Certification

1. **Aircraft Release.** Aircraft release is an airworthiness certification conducted after the completion of servicing, elementary work and/or maintenance tasks certifying that the aircraft is airworthy in that it is fit and safe for flight and is released for operations. The standards applicable to aircraft release are as follows:

a. an aircraft release is required following the completion of one or a series of maintenance, servicing and/or elementary work tasks; and

b. an aircraft release applies to all maintenance, servicing and/or elementary work tasks completed prior to the release of the aircraft to operations.

ADVISORY NOTE

A process may be included in an MPM for the remote release to operations of a deployed aircraft following elementary work, servicing or maintenance tasks when no ARA is available at the deployed location provided the process and any associated procedures have the following provisions:

a. *the aircraft is in the control and custody of the AMO;*

b. *a technician or aircrew is available at the deployed location, who meets the criteria established by the AMO, to make the necessary entries in the aircraft log set or journey log;*

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c. *an ARA at the AMO assumes responsibility for the aircraft release and provides the necessary direction to the technician or aircrew at the deployed location regarding any actions which must be taken prior to the aircraft release;*

d. *on completion of the actions directed by the ARA, the technician or aircrew at the deployed location* makes the *appropriate entries in the aircraft log set or journey log at the deployed location including the name of the ARA, time and date;*

e. *the ARA makes an entry in the Technical Record for the aircraft at the AMO, including the circumstances of the occurrence, name, signature, time and date; and*

f. *the AMO maintains an Organizational Record of all remote aircraft releases providing details of each occurrence including:*

(1) *situation;*

(2) *justification;*

(3) *ARA involved;*

(4) *technician or aircrew authorized to make entries at deployed location; and*

(5) *date and time.*

2. **Aircraft Release Authority (ARA).** No person shall certify an aircraft release unless that person has been granted ARA, in accordance with Part 1, Chapter 4 (Annex C of Section 2).

3. **ARA's Responsibilities.** A person who conducts aircraft release certifies that:

a. all scheduled maintenance required by the Approved Maintenance Program has been accomplished;

b. all required corrective maintenance as indicated in the Technical Record for the aircraft has been accomplished;

c. any corrective maintenance carried out was appropriate for the reported fault;

d. if required, an entry has been made in the technical record for ground test, flight test or flight functional in accordance with 3.1.2.S8.1.b and 3.1.2.S8.1.d;

e. all deferred defects are in accordance with the defect control system of the organization;

f. any recurring defect has been dealt with satisfactorily;

g. all deviations to the Approved Maintenance Program submitted in accordance with 3.1.2.S1.2 have received the appropriate approval from an Acceptable Organization and are still valid;

h. a maintenance release for all applicable maintenance actions, including modification embodiments, has been signed by authorized individuals;

i. all servicing and/or elementary work tasks have been performed by authorized individuals;

j. the flight authority for the aircraft is still valid in that the aircraft has been maintained in accordance with the Approved Maintenance Program or a new flight authority has been issued by an authorized individual in the form of a flight permit; and

k. the empty weight and balance of an aircraft has been maintained in accordance with the Approved Maintenance Program for the aircraft type and the weight and balance control system for the organization, and the current weight and balance report in the Technical Record for the aircraft is valid.

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ADVISORY NOTES

1. *The purpose of the process for the control of aircraft release is to ensure that only aircraft that are considered airworthy are released to operations. This provides a basis upon which the pilot-in-command or aircraft captain determines the acceptability of the aircraft for the intended mission.*

2. *An aircraft is considered airworthy when it is fit and safe for flight and is in conformance to the approved type design. If all maintenance work has been conducted in accordance with the Approved Maintenance Program and all modifications incorporated in accordance with approved modification instructions issued by the Type Certificate Holder for the aeronautical product, further confirmation attesting to the airworthiness of an aircraft is not required.*

3. *Since servicing and/or elementary work tasks do not affect airworthiness, ARA limited to servicing and/or elementary work tasks may be granted to a person who does not meet the eligibility criteria specified in Part 1, Chapter 4 (Annex C of Section 2). The purpose of this limited ARA is to facilitate aircraft operations during situations such as deployments. For example, a pilot-in-command or aircraft captain may be granted ARA to certify an aircraft release following the completion of servicing tasks when an aircraft is deployed away from home base.*

3.1.2.R12 Borrowing of Aviation Replacement Parts

1. A TAA-Acceptable Maintenance Organization may borrow a replacement aviation part from another user of the same type of aeronautical product and may use such a part, provided the standards in 3.1.2.S12, are met.

ADVISORY NOTES

1. *The rules for the permanent transfer of aeronautical products between maintenance programs are detailed in 5.3.2.R5.*

2. *Aviation replacement parts removed from a damaged or crashed aircraft or components that may have been involved in an abnormal occurrence are not considered airworthy and shall not be borrowed.*

3. *These rules do not apply to the robbing of parts within a TAA-Acceptable Maintenance Organization where the part is removed from and installed on aircraft with the same type certificate and maintenance program. The rules applicable to robbing of parts are detailed in 3.1.2.R6*

3.1.2.S12 Borrowing of Aviation Replacement Parts

1. Parts may be borrowed provided:

   a. the borrowed aviation part conforms to the TAA-approved type design for the aircraft;

   ADVISORY NOTE

   This review would normally be performed by the Type Certificate Holder for the aircraft type, given the requirement to ensure that the configuration status for the borrowed aviation part is identical to the current acceptable configuration maintained for the aircraft type.

   b. the part is certified with a Maintenance Release, in accordance with 3.1.2.R10;

   c. the use shall not exceed a maximum of 100 flight hours or 90 days, whichever occurs first; and

   d. a process for borrowing of aviation replacement parts exists within the TAA-approved process manual for the organization.

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2. A process must exist within the TAA-approved process manual to ensure that entries are made in the appropriate sections of the Technical Record, which includes as a minimum:

a. the source of the aeronautical product, including acceptable evidence of conformance to the approved type design;

b. historical information as necessary, such as accumulated operating hours, landings, gun firings or calendar time accumulated prior to transfer; and

c. any limits remaining on the aeronautical product or inspection requirements specified by the Type Certificate Holder for the aircraft.

3.1.2.R13 Parts Recertification

1. A replacement part may be recertified by an organization acceptable to the TAA if the required proof of conformance documentation including usage and maintenance historical information, as required for used parts in accordance with 5.2.2.S1.2, is not available.

3.1.2.S13 Parts Recertification

1. Parts recertification may be carried out by organizations acceptable to the TAA in accordance with 3.1.2.S1, provided that the maintenance required for recertification of the replacement part is within the scope and depth of authority assigned to the organization and a recertification process exists within the organization's TAA-approved APM.

ADVISORY NOTE

Parts recertification process requirements are provided at Annex A, to this chapter.

2. The standards applicable to a replacement parts recertification are as follows:

a. recertification may be performed on a replacement part that:

(1) is intended for installation on an aeronautical product for which the TAA has issued or intends to issue a DND Type Certificate in accordance with Part 2, Chapter 1; and

(2) does not have the proof of conformance documentation supplied with the part, as required by 5.2.2.S1;

b. a recertification applies only to the particular part to which it relates; and

c. each replacement part recertification shall include the following information:

(1) positive identification of the item by type, class, style, grade, model, part number, description, nomenclature and/or serial number as applicable;

(2) identification of the applicable approved type design;

(3) the specific instructions by the TCH detailing the maintenance actions required for recertification of the part;

(4) all maintenance release documentation required to complete the TCH instructions for recertification of the part;

(5) all maintenance release documentation shall refer to the TCH instructions and clearly indicate that the maintenance carried out was for the purpose of recertification; and

(6) the necessary re-created airworthiness documentation as required to permit the part to enter service.

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ADVISORY NOTES

1. *Prior to considering recertification of a part, every effort should be made to obtain replacement documentation for the part from the source of supply. Replacing missing documentation with certified true duplicates is not considered recertification. Recertification should only be considered when all attempts to acquire replacement documentation have failed.*

2. *Parts recertification is normally indicated on an airworthiness release certificate. Acceptable certificates include:*

   a. *a Transport Canada, TC Form 24-0078, Authorized Release Certificate;*

   b. *a Federal Aviation Administration, FAA Form 8130-3 or 8130-4, Airworthiness Approval Tag;*

   c. *a US DoD Form DD250, Material Inspection and Receiving Report, or a Certificate of Conformity in accordance with NATO STANAG 4107 signed by an authorized inspector; and*

   d. *an airworthiness release certificate completed in accordance with the organization's approved procedures provided it satisfies the requirements of 5.4.2.S7.1.c(3).*

3. *More than one item may be included on a recertification, provided there is only one destination for all the items, and each item is clearly identified and described.*

3. Used parts subjected to an abnormal occurrence and life limited parts shall not be recertified unless sufficient information is available to determine their past usage, status and acceptability for return to service.

ADVISORY NOTES

1. *Normal aviation practice is to avoid recertifying parts that are critical to safe flight that have been involved in significant abnormal occurrences. For example, recertification of rotor system dynamic components or propellers involved in sudden stoppage would not be appropriate.*

2. *Life-limited parts where life consumed cannot be determined, cannot be recertified. The reason for this is that, recertification will apply a process that inspects for condition and conformance to the approved type design. This will provide no indication of the life used on a life limited part. Further, policies such as establishing a conservative re-life when life usage data is missing are not appropriate and jeopardise aviation safety.*

4. Any replacement part that fails the recertification process or for which an organization that meets the criteria of 3.1.2.S13.1, cannot be found, shall be declared non-conforming and shall be disposed of in accordance with Part 4, Chapter 1.

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ANNEX A

PARTS RECERTIFICATION PROCESS REQUIREMENTS

1. This process provides generic steps that should be taken for recertification. The requirements for recertification will vary for each part depending on the complexity of the part and the circumstances that necessitate recertification. The organization's TAA-approved Airworthiness Process Manual (APM) shall include recertification policy and processes that include:

a. **Documentation Review.** Any available documentation including historical documents, tags, invoices, packing notes, maintenance records and usage information shall be reviewed to determine the authenticity of the part. If such authenticity can be proven, then the extent of subsequent inspection and/or testing, maintenance and documentation re-creation will be significantly reduced.

b. **Engineering and Technical Guidance.** Normally the inspection, testing or maintenance requirements required for recertification of a part cannot be extracted directly from the approved maintenance program. As a result, the recertification process shall include the requirement for the TCH to provide the criteria against which a part can be recertified.

c. **Inspection and/or Testing.** Inspection and/or testing shall include a check of the part for form, fit and function. If necessary, this may include comparison to a known genuine part. For primary structural parts, testing to determine if they are of the required material and have undergone the specified material processes in the approved type design may be required. This may include hardness tests to determine heat treatment and other material processes. All dimensions shall be within published wear limits. In cases where wear limits are not published, dimensions shall be limited to the tolerances for a new part.

d. **Performance of Maintenance.** If necessary, maintenance shall be performed in accordance with the approved maintenance program for the applicable aeronautical product and any specific instructions issued by the TCH. Parts that are subject to a specified overhaul frequency in the approved maintenance program may be overhauled to meet the recertification requirements. This will not apply to life-limited parts that have both retirement and overhaul frequency. The only way that a life-limited part can be recertified is to positively confirm the usage history of the part.

e. **Airworthiness Documentation.** The necessary airworthiness documentation is re-created to permit the part to enter service including the maintenance records required by the Technical Records procedure for the aeronautical product on which installation is intended.

ADVISORY NOTE

Refer to CAR Standard 571, Appendix H, for additional information on the recertification of aviation parts.

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SECTION 3

ADVISORY MATERIAL (NOT ALLOCATED)

NOTE

In an effort to provide Advisory Material to TAM users as rapidly as possible, all applicable Advisory Material will be published in the form of TAA Advisories, and will be posted on the DTAES websites, which are updated regularly. The Advisory Material presented in this section will eventually be converted into a TAA Advisory.

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PART 3
CONTINUING AIRWORTHINESS

CHAPTER 2 - DESIGN CHANGE CERTIFICATION

SECTION 1

INTRODUCTION

3.2.1.1 Background

1. The purpose of this chapter is to provide the rules, standards and procedural guidance for the management and conduct of design change certification.

2. This chapter contains three sections that address the following subjects:

   a. **Section 1 - Introduction.** Provides a summary description of the Design Change Certification process.

   b. **Section 2 - Rules and Standards.** Provides the rules and standards that apply to Design Change Certification. This section describes "what" must be done.

   c. **Section 3 - Advisory Material.** Provides the additional detail and advisory information that may include suggested means of compliance to certification requirements. This section describes the "who, how and when" of the design change certification process activities.

3. Design changes may be proposed for various reasons such as safety, product improvement, supportability, availability, capability or mission effectiveness. From a technical airworthiness perspective, a design change is defined as a change to the approved type design of an aeronautical product. Design change types include the following:

   a. **Modifications or Alterations.** These are changes to the authorized configuration as defined in the approved type design of an aeronautical product. Modifications are physical changes to the configuration. Alterations are non- physical changes to the configuration or design operating limits that do not require revision to drawings describing the aeronautical product. Examples of alterations include the clearance of stores for carriage on an aircraft, or the use of installed equipment or a functionality of a system which has not previously been authorized. The detailed approval process for this type of design change is provided in this chapter. The TAA considers the airworthiness requirements for the certification of non-standard repairs to be the same as for design changes, even though they may have limited applicability. Non-standard repairs are therefore, subject to the same certification process.

   b. **Changes to an Approved Maintenance Program.** These include changes to airworthiness limitations, maintenance instructions and the maintenance schedule. While the principles of airworthiness approval described in this chapter apply for this type of design change, the detailed processes for obtaining approval are contained in Part 5, Chapter 3.

   c. **Changes in Approved Role, Mission or Task.** These refer to a change in usage or employment of an aeronautical product. Such changes will necessitate a review of the Certification Basis to ensure continued applicability of all design airworthiness requirements in light of the change in role, mission etc. These changes would be reflected in the Statement of Operating Intent (SOI) and may necessitate that design change certification as described in 3.2.1.1.3.a and 3.2.1.1.3.b, be exercised.

4. There are two categories of design change, Minor and Major, as defined in Figure 3-2-1-1.

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Minor	A design change that has a negligible effect on the airworthiness of the approved type design of an aeronautical product.
Major	A design change that has, or may have, more than a negligible effect on the airworthiness of the approved type design of an aeronautical product.

Figure 3-2-1-1 Design Change Categories

5. To assure an acceptable level of aviation safety is maintained, the Technical Airworthiness Program requires that all proposed major design changes are subjected to a certification process to obtain airworthiness approval prior to Technical Airworthiness Clearance (TAC) and implementation. By definition, a minor design change has a negligible effect on airworthiness, and therefore, does not require certification. Minor design changes do, however, still require appropriate documentation and recording.

3.2.1.2 Design Change Certification Process

1. The objective of the Design Change Certification process is to ensure that the implementation of a proposed design change is in compliance with the approved Certification Basis for the approved type design of the aeronautical product and any aspects required for the conduct of the TAC have been appropriately addressed. To achieve this goal, it is necessary to:

a. confirm that the level of safety attained by the initial airworthiness of the approved type design is maintained with the proposed design change incorporated; and

b. ensure that the data required to update the type record for the design and the technical record for the specific aeronautical product have been identified and provided.

2. **General.** Within the Technical Airworthiness Program, the structure of the Design Change Certification Process that must be followed for a particular proposed design change depends on the following factors:

a. The type of design change;

b. The potential effects on airworthiness;

c. The magnitude and complexity of the design change;

d. The assigned scope and depth of authority of the organization conducting the design change; and

e. Any previous relevant approval or certifications of the same design change.

3. Typically, design changes for DND aeronautical products are derived from two sources. They are either developed by/for DND to meet a specific requirement or they may take the form of existing design changes developed by other agencies that are adapted and incorporated into a DND aeronautical product. In the latter case, the TAA intends to give maximum credit to previous approvals and certifications from other airworthiness authorities or competent design organizations. Credit for previously approved design changes may be granted by the TAA or an authorized individual. Part 2, Chapter 5, Type Design Examination (TDE) provides details.

4. **Elements.** The design change certification process consists of the following elements that are illustrated in Figure 3-2-1-2.

a. Identification of design change type;

b. Design Change Categorization;

c. Certification Strategy;

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d. Certification Basis;

e. Certification Plan;

f. Compliance Program;

g. Compliance Record;

h. Airworthiness Documentation; and

i. Airworthiness Approval.

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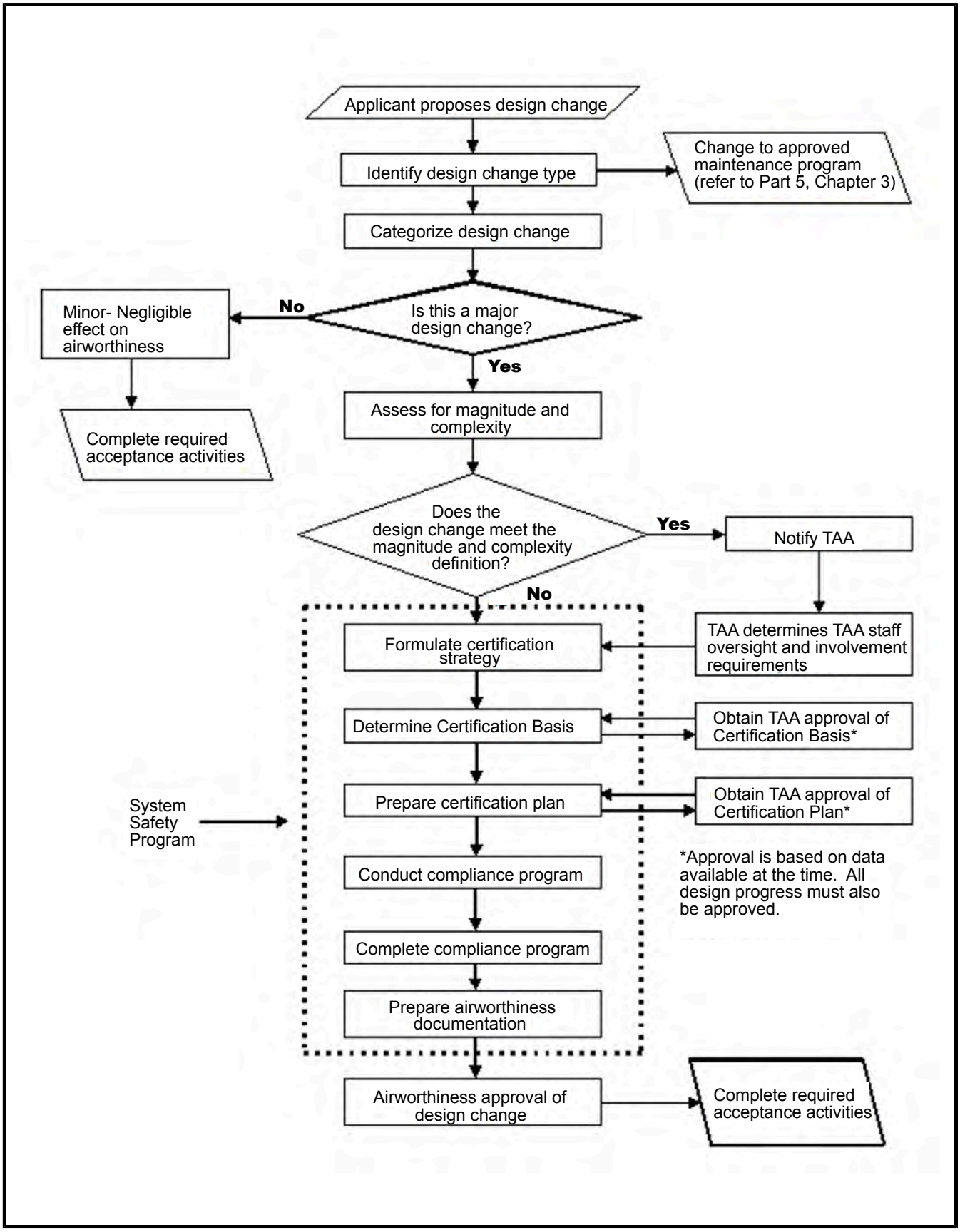

Figure 3-2-1-2 Design Change Certification Process

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5. **Identification of Design Change Type.** The applicant must determine the design change type in order to ascertain which of the design change certification processes to invoke. Modifications, alterations and non-standard repairs shall be subject to the certification process described in this chapter; changes to the approved maintenance program shall be certified as described in Part 5, Chapter 3. Changes in approved role, mission or task shall be subject to either this chapter or Part 5, Chapter 3, depending on the design change required.

6. **Design Change Categorization.** All proposed design changes must be assessed for their potential effect on airworthiness and categorized as either minor or major to determine if the design change certification process is to be followed. Proposed major design changes may require additional scrutiny and involvement of the TAA if their magnitude or complexity is such that the design change is considered extensive and the approval process requires increased control and management effort.

7. **Certification Strategy.** Once a design change has been categorized, the overall approach to the certification process must be determined. For any proposed major design change, the applicant must decide if any feature of the change indicates that consultation with TAA staff in the early certification planning stages is merited. Such consultations are required when there is any possibility that TAA staff will need to be involved in determining the certification approach.

8. Although there are no specific rules or standards governing the development of a certification strategy, the following points are to be considered:

a. The original Certification Basis or Technical Specification of the aeronautical product to which the design change applies (the host product);

b. The applicable design standards for the design change;

c. Compatibility of the design change design standards with older host product design standards; and

d. Whether the design change was specifically designed for the host product or adapted from a Commercial Off-the- Shelf (COTS) or Military Off-the-Shelf (MOTS) design.

9. When consultation with the TAA is required, the following aspects should be agreed upon for later inclusion in the Certification Plan:

a. System Safety Program standards and methodologies, including agreement on relevant standards and references;

b. Probable certification requirements and finding authorities;

c. Credit to be applied for previous airworthiness approval by another regulatory agency or OEM (Part 2, Chapter 5);

d. Applicants' initial schedule, including milestones for continued consultation with the TAA; and

e. The TAA Level of Involvement (LOI) in the approval process.

10. Where an organization has been assigned authority by the TAA, the scope and depth of that authority will vary the level of involvement of the TAA staff. Major design changes for which there are no contentious features or elements, for which the relevant standards are clearly identified and appropriate and which fall fully within the authorized organization's scope and depth of authority shall not require the involvement of the TAA regulatory staff. However, appropriate documentation for the certification process must still be raised and archived.

11. **Certification Plan.** The key activities in the design change certification process must be planned in order to provide reasonable assurance that the certification program will result in airworthiness approval of the proposed design change. The requirements for a certification plan are stated within 3.2.2.R3, and further guidance is provided in 3.2.3.3. The certification plan encompasses many of the results of the certification strategy deliberations described in 3.2.1.2.7, through 3.2.1.2.10, including identification of those compliance elements for which the TAA is likely to

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retain approval authority. The certification plan shall also describe, in general terms, how Finding Authority is to be assigned to other agencies/individuals.

12. **Certification Basis.** The Certification Basis is the collection of certification requirements that must be satisfactorily addressed in order to grant airworthiness approval. The Certification Basis for a design change must ensure that the airworthiness integrity of the original approved type design is not degraded by the incorporation of the design change. The incorporation of a proposed design change into the approved type design of an aeronautical product may introduce new safety-related hazards or increase existing hazards that may affect the safe flight of an aircraft. A system safety program must be included as part of the Certification Basis to ensure that a minimum acceptable level of safety is satisfactorily defined and addressed. The system safety program shall identify critical functions, determine the hazards that would result from the loss of those functions, and evaluate the proposed design change to ensure that the selected certification requirements address these hazards. The scope of the system safety program is limited to those areas affected by the design change. The Certification Basis must also be appropriate for the intended operating use and environment of the host aeronautical product. Additional detail on the selection of a Certification Basis is found at 3.2.3.4.

13. **Compliance Program.** The compliance program shall systematically and comprehensively prove compliance with the Certification Basis. A compliance program consists of the following:

a. Production of a compliance matrix and submission for approval by the TAA or an authorized individual.

b. Conduct and document proof of compliance.

c. Recording findings of compliance in the compliance matrix.

14. **Compliance Record.** The means of compliance, the method of demonstrating compliance, the reference to the substantiating data or documented proof, the identity of the finding authority and the compliance results or finding statement for each airworthiness requirement in the Certification Basis are recorded in the compliance matrix. When all finding authority signatures have been obtained, the compliance matrix becomes the compliance record for the particular proposed design change.

15. **Airworthiness Documentation.** The applicable data and documents shall be prepared and submitted to the TAA or an authorized individual for review and/or approval. Depending on the complexity and specifics of the proposed design change, the following may be applicable:

a. Data and documents necessary to define the design features of the design change.

b. Compliance record.

c. Supplements or amendments to the Instructions for Continued Airworthiness (ICA).

d. Supplements or amendments to the aircraft flight manual or operating instructions.

e. Amendments to the MMEL.

16. **Airworthiness Approval.** Airworthiness approval of a design change certifies that the rules and standards of Part 3, Chapter 2, have been met. This is also a critical requirement leading to TAC. See Part 2, Chapter 3, for rules and standards applicable to TAC.

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SECTION 2

RULES AND STANDARDS

3.2.2.R1 Design Change Categorization

1. Where a proposed design change is assessed for its potential effects on airworthiness and categorized as minor by an authorized individual, in accordance with 3.2.2.S1, no further airworthiness certification activity is required. Sufficient technical data must be available to substantiate and formally document the categorization.

ADVISORY NOTE

Although no technical airworthiness approval requirements are attached to a minor design change, other requirements such as the details and control of the design change must still be met. These include description documentation, publication amendments, maintenance program changes etc.

2. Where a proposed design change is assessed and categorized as Major by an authorized individual, in accordance with 3.2.2.S1, design change certification shall be conducted in accordance with the rules and standards of this chapter.

3. Notification of the TAA, by the Applicant, shall occur following categorization of Major design changes that are extensive. Major design changes that are extensive meet the considerations in 3.2.2.S1 for magnitude and complexity.

3.2.2.S1 Design Change Categorization

1. **Design Change Category.** A proposed design change shall:

   a. Be assessed for its potential effect on the airworthiness of the approved type design of an aeronautical product into which incorporation is intended and categorized as major or minor; and

   b. Have the assessment, and subsequent categorization, of the proposed design change conducted by an authorized individual.

ADVISORY NOTE

An authorized individual is someone who has been assigned authority by the TAA or the person(s) within the Acceptable Organization responsible for authorization of other personnel within the organization to perform airworthiness-related activities.

2. Design change categories are defined as follows:

   a. **Minor.** A design change that has a negligible effect on the airworthiness of the approved type design of an aeronautical product.

   b. **Major.** A design change that has, or may have, more than a negligible effect on the airworthiness of the approved type design of an aeronautical product.

ADVISORY NOTES

1. *A design change is categorized as major if it has, or may have, more than a negligible effect on:*

   a. *Design operating limitations;*

   b. *Structural strength;*

   c. *Aero-elastic properties;*

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d. *Performance;*

e. *Power plant operation;*

f. *Flight characteristics;*

g. *E3 (Electromagnetic Environmental Effects) characteristics;*

h. *Approved maintenance program;*

i. *Carriage and release of stores;*

j. *Escape systems performance or operating limitations;*

k. *Crew clothing and life support equipment interface with aircraft;*

l. *Avionics (including software and electrical);*

m. *Environmental characteristics of noise, fuel venting or engine emissions;*

n. *Equipment required by airworthiness rules or standards; and/or*

o. *Any other aspects affecting airworthiness.*

2. *For further guidance on conducting an assessment to determine the design change category, refer to 3.2.3.1.*

3. **Magnitude and Complexity Considerations.** Some major design changes may be extensive in scope and of such magnitude and/or complexity as to merit direct TAA oversight of some or all of the design change certification process elements. Design changes of this type shall be referred to the TAA for determination of TAA level of involvement.

ADVISORY NOTES

1. *Examples of such design changes include:*

   a. *A design change that affects the integration of several critical systems;*

   b. *A design change that results in a model change to the aeronautical product involved; or*

   c. *A design change that involves several design organizations resulting in a complex management structure for the completion of the required airworthiness certifications.*

2. *Additional details for defining the magnitude and complexity of a major design change are available in 3.2.3.2.*

3. *Approval of design changes that are assessed as being extensive may involve the convening of a Design Certification Board (DCB), as described in Part 2, Chapter 1.*

3.2.2.R2 Certification Basis

1. The Certification Basis for a proposed design change to an aeronautical product, as specified in 3.2.2.S2, shall be submitted for approval to the TAA or an authorized individual.

3.2.2.S2 Certification Basis

1. The Certification Basis for a proposed design change to an approved type design is:

   a. The airworthiness standards recorded in the current Type Certificate Data Sheet (TCDS) of the approved type design in which incorporation is intended;

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b. Any additional or updated standards of airworthiness required to ensure that the approved type design with the design change incorporated provides a level of safety as high as reasonably practicable but not less than that provided by the standards recorded in the current TCDS;

c. Any special conditions including additional standards specified by the TAA as being necessary to ensure an acceptable level of safety is achieve for the proposed design change;

d. The applicable noise, fuel venting, and engine emission standards that are in force on the date airworthiness approval is granted; and

e. Any exemptions or deviations to airworthiness standards due to special purpose operations, or mission specifics.

ADVISORY NOTE

Some DND legacy fleets do not have a formal Certification Basis or TCDS. Details on the development/determination of a Certification Basis in these cases is provided at 3.2.3.4.

2. With the approval of the TAA, later amendments to the airworthiness standards determined in accordance with 3.2.2.S2.1.a may be selected provided that any related amendments are also included.

ADVISORY NOTES

1. *A System Safety Program normally consists of the following elements:*

   a. *Identify critical functions related to the airworthiness of the product;*

   b. *Identify potential safety-related hazards associated with the incorporation of proposed design change;*

   c. *Establish the safety requirements of a system; and*

   d. *Evaluate the proposed design change to show that the qualitative and quantitative safety requirements are met.*

2. *It is often the case that a systems safety program has already been conducted during the initial certification of the existing aeronautical product or for a previous design change. These previously conducted analyses can be used in determining the hazards, including their criticality and severity. For aeronautical products that have not been subjected to a safety assessment, one must be conducted to a level that will clearly determine the potential safety-related hazards and ensure that the proposed design satisfactorily addresses/encompasses the minimum certification requirements to maintain an acceptable level of safety for the aeronautical product.*

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3. *Where the proposed design change affects system functionality or integration, a system safety program shall be conducted to identify and address any potential safety-related hazards associated with the incorporation of a proposed design change into an existing type design that may impact the safe operation of the aeronautical product.*

4. *There are a number of accepted techniques and methodologies that may be employed in the conduct of a system safety program. Examples are provided as follows, however, this list does not exclude the use of other equivalent means:*

   a. *MIL-STD-882C (including task 301) or 882B Notice 1;*

   b. *SAEARP 4761 for non-complex or independent systems;*

   c. *SAEARP 4754 for highly integrated and complex avionics systems;*

   d. *DEF STAN 00-56 Safety Management Requirements for Defence Systems;*

   e. *AC 25-1309-1A; and*

   f. *AC 23-1309-1C.*

3.2.2.R3 Certification Plan

1. A Certification Plan shall be prepared and approved, as specified in 3.2.2.S3.

3.2.2.S3 Certification Plan

1. The Certification Plan shall:

   a. be produced by the applicant for major design changes;

   b. be approved by the TAA or an authorized individual within the organization;

   c. outline the purpose, scope, constraints and assumptions and applicable definitions of the certification program;

   d. identify the aeronautical product to which the proposed design change applies including make, model, registration number and type certificate;

   e. describe the proposed design change including;

      (1) use and operating environment applicable to the change;

      (2) type design change; and

      (3) details such as principle design features, operating characteristics and limitations.

   f. describe the process proposed for the selection and submission of the Certification Basis, including identification of any requests for a TAA exemption and/or deviation;

   g. outline the proposed certification process, including key activities, responsibilities, organizational relationships and schedule;

   h. describe the intended compliance program including:

      (1) the compliance matrix, as per 3.2.2.S4.2.;

      (2) the process for assignment of technical airworthiness authority to personnel; and

      (3) the proposed methods for tracking compliance progress.

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i. describe the process for the development and submission of the required airworthiness documentation; and

j. describe any intention to seek credit for TDE results as described in Part 2, Chapter 5.

ADVISORY NOTES

1. *The certification plan for major design changes that have been assessed as extensive must be approved by the TAA. Upon approval, the certification plan provides the applicant with a reasonable assurance for design change airworthiness approval.*

2. *A more detailed description of the requirements and processes involved in certification planning is available at 3.2.3.3.*

3.2.2.R4 Compliance Program

1. A compliance program shall be conducted in accordance with 3.2.2.S4 to systematically and comprehensively provide documented evidence of compliance with the Certification Basis.

3.2.2.S4 Compliance Program

1. The compliance program shall include the following activities and products:

a. Production of a compliance matrix;

b. Submission of the compliance matrix for TAA or authorized individual approval;

c. Conduct and documentation of appropriate means and methods of compliance; and

d. Recording of findings of compliance in the compliance matrix.

ADVISORY NOTE

During the compliance program, issues may arise where a certification requirement may be insufficient (e.g., the lack of fly-by-wire certification requirements), or where a certification requirement may not be fully met. In this case, finding authorities will raise Issue Papers to document the technical issues and request that the Applicant provide a response to address those issue(s). Issue Papers may be iterative, but they must be closed by the TAA prior to granting Airworthiness Approval for the design change.

2. **Compliance Matrix.** For each requirement in the Certification Basis, the format of the compliance matrix (as proposed in the certification plan) shall include provision for:

a. airworthiness certification requirement, including a description of the requirement and identification, revision number and date of the applicable airworthiness standard;

b. means of compliance and method of demonstrating compliance;

c. proof of compliance, including reference to any substantiating data or report; and

d. finding of compliance including:

(1) finding authority identification;

(2) finding result;

(3) finding authority signature; and

(4) finding date.

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3. **Means of Compliance.** The three basic means of demonstrating compliance are description, analysis and test.

ADVISORY NOTES

1. *Examples for each means of compliance are:*

   a. ***Description.*** *Engineering inspection, vendor data and statement, service experience, drawing or evidence of approval such as FAA/TSO;*

   b. ***Analysis.*** *Failure Modes and Effect Analysis (FMEA), structural loads analysis, stress analysis, electrical load analysis and software evaluation and documentation; and*

   c. ***Test.*** *Flight test, ground test, fatigue test, simulation, fire test, environmental test and functional test. The publication C-05-020-007/AM-000* - Policy and Procedures - Flight Test Orders for the Canadian Forces - *defines the DND policy and requirements for flight test and evaluation, as well as related ground testing items that are subject to the requirements of the DND/CAF Airworthiness Program by or on behalf of the CAF.*

2. *Although not included as means of compliance (but they are noted on the compliance matrix) are the items included as part of the Certification Basis that do not require compliance such as:*

   a. *Exempt (by exemption granted);*

   b. *Deviation (by deviation granted);*

   c. *Equivalent safety issued;*

   d. *Not applicable (to the design of the product); and*

   e. *Noted (by example).*

4. **Methods of Compliance.** Methods of compliance expand upon the means of compliance by providing detailed information about how compliance will be demonstrated. The method of compliance refers to a procedure (for example, Test Plan) that shall contain the following information:

   a. the specific (or worst case) conditions required to demonstrate compliance;

   b. any critical assumptions used;

   c. the pass/fail criteria (usually associated with 'test' as a means of compliance);

   d. an explanation of what specific levels of performance a system or component must attain to be in compliance; and

   e. any other information considered important in describing how compliance is to be demonstrated.

5. **Findings of Compliance.** A Finding of Compliance is a technical airworthiness function, as defined in 1.3.1.7.2, that must be performed by the TAA or an authorized individual. A Finding of Compliance is certification that a specific aspect of a proposed change to an approved type design complies with the applicable certification standards identified in the Certification Basis. Each requirement listed in the Certification Basis requires one or more Findings of Compliance before airworthiness approval may be granted. A Finding of Compliance certifies that:

   a. the airworthiness certification standard for the specific requirement is appropriate;

   b. the means and methods of demonstrating compliance are appropriate; and

   c. the proof or demonstration of compliance is adequate.

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ADVISORY NOTE

Additional information on the design change Finding of Compliance is available at 3.2.3.5.

6. The TAA shall be provided access to an aeronautical product with the design change incorporated in and the associated data during the compliance program to determine or review compliance with the Certification Basis. Access may be required to:

a. make an engineering assessment;

b. conduct an inspection;

c. review a finding of compliance; and/or

d. participate in or witness any planned test.

7. **Compliance Record.** When each cell of the compliance matrix is completed with the relevant entry, the matrix, combined with all referenced data, forms the compliance record. The compliance record in turn, forms part of the type record and is subject to the requirements of Part 5, Chapter 5.

3.2.2.R5 Airworthiness Documentation

1. The applicable documents and data, as per 3.2.2.S5, shall be prepared and submitted to the TAA or an authorized individual for review and/or approval.

3.2.2.S5 Airworthiness Documentation

1. Airworthiness documentation includes the following:

a. Data and documents necessary to define the design features of the design change;

b. Compliance record including referenced documents;

And if applicable:

c. Proposed supplements or amendments to the Instructions for Continued Airworthiness (ICA) for the aeronautical product into which the design change is to be incorporated. (refer to Part 5, Chapter 3);

d. Proposed supplements or amendments to the aircraft flight manual or operating instructions for the aeronautical product in which the design change is to be incorporated (refer to 2.1.2.R5); and

e. Amendments or supplements to any other airworthiness documentation required to support the in-service aeronautical products including changes to a TAA-approved Master Minimum Equipment List (MMEL) (refer to Part 2, Chapter 6).

ADVISORY NOTES

1. *When the process (Part 2, Chapter 5) is used to provide some or all of the substantiation for approval of a design change, all of the applicable airworthiness documentation must still be provided.*

2. *Data approval is only granted once, in the official language in which the data was originally written. Translation of approved data does not require an airworthiness approval. It is the responsibility of the Type Certificate Holder to ensure that appropriate translation services are in place, which provide accurate translations of approved data.*

3.2.2.R6 Design Change Airworthiness Approval

1. The TAA or an authorized individual shall grant airworthiness approval to a major design change, in accordance with 3.2.2.S6. When credit is to be given for certification work performed by other airworthiness authorities, the

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results of the assessments of acceptability and applicability of the previous design change shall be used to satisfy some or all of the requirements of 3.2.2.S6.

3.2.2.S6 Design Change Airworthiness Approval

1. Design change airworthiness approval certifies that:

   a. The Certification Basis is appropriate;

   b. The means and methods of demonstrating compliance are appropriate;

   c. The proof or demonstration of compliance supporting the findings of compliance are adequate; and

   d. Authorized individuals made each finding of compliance.

2. The design change certification elements described in this chapter support the ultimate goal of obtaining design change approval by requiring that:

   a. the design change was assessed for its potential effects on airworthiness and categorized by an authorized individual, in accordance with 3.2.2.R1;

   b. the final version of the Certification Basis is appropriate, meets the requirements of 3.2.2.R2, and therefore is approved;

   c. a certification plan was prepared and approved, in accordance with 3.2.2.R3;

   d. the requirements of the compliance program as described in 3.2.2.R4, were met; and

   e. the airworthiness documentation required by 3.2.2.R5, was reviewed or approved.

3. Airworthiness approval shall be granted when it is demonstrated that a proposed design change to an approved type design meets all of the applicable standards. When a proposed design change does not meet all of the applicable standards, provisional airworthiness approval may be granted if it is demonstrated that:

   a. the temporary non-compliance would not degrade the safe operation of in-service aeronautical products; and/or

   b. the non-compliance is adequately mitigated by appropriate operating limitations.

4. **Type Design Examination (TDE).** In order to minimize duplication of effort, the TAA is prepared to give maximum credit to certification work performed by other airworthiness authorities and design organizations, provided that the work is acceptable to the TAA. Upon completion of the TDE the TAA or an authorized individual will determine the amount of credit that may be applied towards obtaining design change airworthiness approval.

5. **Record of Approval.** The airworthiness approval of a design change shall be documented as described in the EPM of each organization that holds the scope and depth of authority to approve design changes. For design changes for which the TAA has reserved approval, a formal notification to the applicant will be provided.

ADVISORY NOTES

1. *In the case where the TDE results address all the certification requirements for design change approval, a statement to that effect, with reference to the substantiating documentation (for example, STC, OEM, SB etc.) may be sufficient as a Record of Approval.*

2. *In cases where the TDE results provide partial substantiation for design change approval, the remaining areas must follow the compliance and approval process as described above.*

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SECTION 3

ADVISORY MATERIAL

NOTE

In an effort to provide Advisory Material to TAM users as rapidly as possible, all applicable Advisory Material will be published in the form of TAA Advisories, and will be posted on the DTAES websites, which are updated regularly. The Advisory Material presented in this section will eventually be converted into a TAA Advisory.

3.2.3.1 Assessment of the Potential Effects on Airworthiness

1. The potential effects on the airworthiness of an aeronautical product must be assessed prior to incorporating a proposed design change to ensure that all aviation safety and airworthiness requirements are adequately addressed during the development and implementation of the design change.

2. **Process for Assessing the Potential Effects on Airworthiness.** In general, a proposed design change may have a major effect on airworthiness if any of the findings of compliance to the original Certification Basis could be invalidated by the proposed design change. A design change categorized as Major has, or may have, more than a negligible effect on one or more of the following characteristics of the approved type design of the aeronautical product into which incorporation is intended:

a. Design operating limitations.

b. Structural strength.

c. Aero-elastic properties.

d. Performance.

e. Powerplant operation.

f. Flight characteristics.

g. E3 (Electromagnetic Environmental Effects) characteristics.

h. Approved maintenance program.

i. Carriage and release of stores.

j. Escape system performance or operating limitations.

k. Crew clothing and life support equipment interface with aircraft.

l. Avionics (including software changes and electrical).

m. Environmental characteristics of noise, fuel venting or engine emissions.

n. Equipment required by an airworthiness rule and/or standard and/or any other aspect affecting airworthiness.

3. The process for assessing the potential effects on the airworthiness of an approved type design for an aeronautical product can consist of asking a series of questions regarding the characteristics, listed in 3.2.3.1.2. If the answer to any of the following questions is "YES", then the proposed design change will normally be categorized as major. It should be noted that if you are unsure as to whether or not the answer to one of the following questions is "YES", then you must categorize it as major, or contact TAA staff for clarification. Major design changes necessitate that specific attention be paid to the airworthiness requirements during their development and certification to ensure the aeronautical product is fit and safe for flight. It is also important to assess the cumulative effect of a number of

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minor design changes on a particular system or area. It may be necessary to approach a package of minor design changes as if they were a single entity and thus qualified as a major category design change.

a. **Design Operating Limitations.** Does the proposed design change involve a revision to the design operating limits specified in the flight manual or operating instructions listed in the Type Certificate Data Sheet (TCDS) for the approved type design?

b. **Structural Strength.** Does the proposed design change alter:

(1) a principal component of the aircraft structure such as a frame, stringer, rib, spar, skin or rotor blade?

(2) a life-limited part or a structural element that is subject to a damage tolerance assessment or fail safe evaluation?

(3) the strength or structural stiffness of a pressure vessel?

(4) the mass distribution of a structural element (i.e., Changes which result in an increase in the maximum certified weight or the centre of gravity limits of the aircraft)?

(5) a containment or restraint system for occupants or cargo?

(6) the structure of seats, harnesses or their means of attachment?

c. **Aero-elastic Properties.** Does the proposed design change:

(1) affect the stability or controllability?

(2) induce flutter or vibration?

d. **Performance.** Does the proposed design change:

(1) increase drag or exceed aerodynamic smoothness limits?

(2) alter thrust or power output?

(3) decrease the range?

e. **Powerplant Operation.** Does the proposed design change:

(1) affect the power output or control qualities of the powerplant, engine, propeller, or their accessories (i.e. convert the aircraft engine from one approved model to another)? Involve changes in compression ratio, propeller reduction gear, impeller gear ratios or the substitution of major engine parts which require extensive rework and testing of the engine? Alter propeller blade and/or hub design? Alter the governor or control design? Install a propeller governor or feathering system? Install a propeller de-icing system? Install parts not approved for the propeller?

(2) alter the approved operating limitations (i.e., temp, press, RPM, etc.)?

(3) replace aircraft engine structural parts with parts not supplied by the OEM or parts not specifically approved by the TAA or a TAA-authorized individual?

(4) install an accessory which is not approved for the engine?

(5) remove accessories that are listed as required equipment on the aircraft or engine specification?

(6) install structural parts other than the type of parts approved for the installation?

(7) alter the powerplant in order for it to use fuel of a rating or grade other than that listed in the engine specification or TCDS?

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f. **Flight Characteristics.** Does the proposed design change:

(1) affect the handling of the aircraft?

(2) affect stability or controllability?

(3) affect the stall characteristics?

(4) significantly alter the mass distribution of the aircraft?

g. **E3.** Does the proposed design change:

(1) significantly increase, alter or induce E3 characteristics?

h. **Approved Maintenance Program.** Does the proposed design change:

(1) affect an airworthiness limitation? (life-limited parts, certification maintenance requirements, structural integrity/damage tolerance inspections)

(2) extensively (refer to Part 5, Chapter 3) alter the maintenance schedule? (is the schedule format/ structure affected?)

(3) affect a conditional inspection?

(4) derive from a change in the aircraft role, mission or utilization?

i. **Carriage and Release of Stores.** Does the proposed design change:

(1) allow the carriage and release of a new store?

(2) affect the manner in which an authorized store is carried and/or released from an aircraft?

j. **Escape System Performance or Operating Limitation.** Does the proposed design change:

(1) alter the safe ejection envelope of the ejection seat fitted to the aircraft?

(2) affect the ability of the ejection seat to perform safely over the entire range of authorized occupants?

k. **Crew Clothing and Life Support Equipment.** Does the proposed design change:

(1) affect the crew's ability to perform the required tasks?

(2) interfere with other equipment?

(3) affect the crew's crash survivability and ability to escape?

l. **Avionics (Including Software and Electrical).** Does the proposed design change:

(1) replace an existing item of electrical/electronic equipment required for airworthy operation with an item that is operationally equivalent or functionally upgraded but not certified for the approved type design?

(2) add or integrate a new item of electrical/electronic equipment required for airworthy operation that is not certified for the approved type design?

m. **Other Factors Affecting Environmental Characteristics.** Does the proposed design change increase noise levels, fuel venting or engine emissions?

n. **Equipment Required By Airworthiness Rules and/or Standards.** Does the proposed design change provide for the installation or alteration of any equipment or system required to be installed or carried on board the aircraft by an airworthiness rule or standard issued by the Technical Airworthiness Authority

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(TAA), the Operational Airworthiness Authority (OAA), or the Airworthiness Investigative Authority (AIA)?

o. **Any Other Aspect Affecting Airworthiness.** Does the proposed design change:

(1) alter any operating procedures or system operating information in the flight manual or operating instructions?

(2) affect the flight crew's visibility or their ability to control the aircraft?

(3) affect egress from the aircraft?

(4) reduce the storage capacity of an oxygen system or alter the oxygen flow rate?

(5) affect flight controls or autopilot or stability control system?

(6) alter an electrical generation device, or the electrical distribution system between the generation source and its primary distribution bus or other bus designated as essential?

(7) reduce the storage capacity of the primary battery?

(8) affect a communication or navigation system required by the approved type design?

(9) affect instruments or indicators that are installed as part of a system required by the approved type design?

(10) change the information on, or location of, a placard required by the type design or an Airworthiness Directive?

(11) alter the basic design of an appliance? (other than in accordance with the OEM instructions or applicable AD)

(12) affect hydraulic or electrical actuating system or components?

(13) affect the basic design of the fuel, oil, cooling, heating, cabin pressurization, electrical, hydraulic, de-icing or exhaust systems?

(14) affect any exemption or deviation that has previously been issued by the TAA?

4. Note that a proposed non-standard repair must be subjected to the same review of characteristics to assess its potential effects on the airworthiness of the existing aeronautical product into which it is to be incorporated. A repair does not change the approved type design; its purpose is to restore the aeronautical product to an airworthy condition. A determination of major or minor must be made in order to ensure that all safety and airworthiness certification requirements are addressed, as they would be for a similarly categorized design change.

3.2.3.2 Major and Extensive Design Change Determination

1. A design change categorized as major may vary in complexity from a relatively straightforward modification involving a single component to a complete replacement of several systems. This range of complexity must be addressed in the regulation of design change certification.

2. This section is specifically concerned with the additional assessment of a major design change in order to determine if it needs to be addressed as extensive, as discussed in 3.2.2.S1. Such a determination of the extent of a proposed design change is a subjective assessment of the magnitude and complexity of the change. In performing the assessment, both the physical and performance/functional aspects of the design change must be considered. Physical aspects may include structures, systems, equipment, and components (physical aspects can cover both "hardware" and "software"). Performance/functional characteristics may include handling qualities, emergency provisions, structural integrity, aero-elastic characteristics and crashworthiness.

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3. The following are examples of major design changes that would normally be categorized as extensive:

a. Most aircraft mid-life updates or life extension programs would be considered extensive, however it depends on the number and criticality of the systems involved and the potential interrelationships of the systems (e.g., CF188 modernization and CP140 AIMP);

b. Replacement of an engine model or type on an aircraft type (e.g., CH124 upgrade to -100 engine);

c. A change to the type design resulting in the assignment of a new model number to an existing type certified product (e.g., CC150T);

d. Incorporating numerous design changes to approved type design as a consolidated group (e.g., CP140 AIMP); or

e. Changes that affect several critical interrelated systems (e.g., CF188 ECP 583).

4. The TAA always reserves the right to review the assessment of the extent of a proposed design change. Therefore, if any doubt exists in the assessment of the extent of a proposed design change, consultation with TAA staff is highly recommended prior to the initiation of the design change certification process.

5. For existing military aircraft fleets with no formal Certification Basis, the selection of appropriate standards against which to certify design changes is always problematic. Given that some type designs are 20 or 30 years old, many of the original design standards and specifications may not be applicable or relevant to the proposed design change. This topic is covered in more detail in 3.2.3.4, however, it is mentioned here to emphasize the importance of early discussions with TAA staff to arrive at a suitable suite of standards to apply to the extensive design change.

6. Similarly, the certification strategy can vary widely, depending upon many factors. Again discussions with TAA staff will provide the agreed level of detail to be included in the certification documentation and the approach to be taken in the certification strategy. The following elements should be covered in the discussions between TAA staff and the applicant as required:

a. Identification of the (host) aeronautical product to which the design change applies including make, model, registration numbers and type certificate as applicable;

b. Description of the design change including effects on component, system, and aircraft level operations or functions. The description should address hardware, software, and interrelationship aspects introduced or affected by the design change. The following should be included:

(1) Use and operating environment applicable to the change;

(2) General details such as principal design features, operating characteristics and airworthiness limitations;

(3) Any novel or unique design features, including the use of new technology or technology applications; and

(4) The reasons why the design change is considered extensive.

c. An outline of the purpose, scope, constraints and assumptions for the proposed certification strategy, including:

(1) The existing Certification Basis for the host aeronautical product or, where no pre-existing Certification Basis is available, identify the certification standards to be applied;

(2) An outline of the certification strategy used to approve design changes developed and/or approved by other agencies, and the credit that the applicant intends to seek for that previously approved design change; and

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(3) Recommendations regarding the amendment of the existing type certificate or the issuing of a new type certificate with the design change incorporated.

d. An outline of the intended approach to the development of the Certification Basis for the design change including:

(1) Selection of the applicable certification, noise and environmental standards;

(2) Identification of areas where a potential TAA exemption and/or deviation request may be made;

(3) Identification of areas where special conditions may be required; and/or

(4) Identification of areas where TAA findings of equivalent safety may be necessary; and

(5) System safety program requirements.

e. An outline of the major activities in the certification program, responsibilities (TAA, PMO, WSM, contractor, other), organizational relationships and schedule; and

f. An outline of the proposed process for obtaining airworthiness approval (certification) of the design change including assignment of authority to make findings of compliance on behalf of the TAA.

7. In summary, a major design change that is deemed extensive requires greater attention and control than most other major design changes. This may extend to the point of being treated as a new type design and the application of the type design approval process as described in Part 2, Chapter 1, including convening a Design Certification Board (DCB). Therefore, the primary purpose of the information provided above is to ensure there is formal agreement on the approach to be taken for each specific major design change that has been assessed as extensive.

3.2.3.3 Design Change Certification Planning

1. **Introduction.** Certification planning involves identification of the certification requirements and the certification strategy for the proposed design change. The collection of the applicable airworthiness standards for a particular design change is known as the Certification Basis for that design change. Each requirement listed in the Certification Basis requires a finding of compliance to be made by an authorized individual. All the airworthiness-related activities leading to a release to service for the proposed design change should also be considered during certification planning. Certification planning should commence as soon as possible in the development of a proposed design change. This ensures that all relevant certification requirements are considered during the initial stages of development, provides an opportunity to influence the evolution of the design development and minimizes delays in the development and certification of the proposed design change.

2. The certification of a proposed design change and the manner in which a particular design change will proceed through the various airworthiness-related activities involved will be influenced by several factors such as:

a. **Type of Design Change.** Within the technical airworthiness program, specific requirements have been established for each type of design change. For example, proposed design changes involving modifications or alterations to an approved type design are processed in accordance with this chapter and changes to an approved maintenance program are processed in accordance with Part 5, Chapter 3.

b. **Complexity of Design Change.** The complexity of a proposed design change can significantly affect the requirements and the process involved in the design change certification. A proposed design change that has a negligible impact on the airworthiness of an approved type design is categorized as minor and no further airworthiness certification action is required. Whereas, a complex design change involving several integrated systems that may affect the safe flight of an aircraft will require a comprehensive investigation of the airworthiness aspects of incorporating the proposed design change into the approved type design. This may involve a detailed safety assessment or system safety program, design assurance techniques and the use of several airworthiness standards from different sources.

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c. **Aeronautical Product Functions.** The criticality of the aeronautical product functions involved and the manner in which they are affected can significantly affect the certification requirements as well as the process to be followed. An addition of a new function or an alteration of an existing function that may affect the safe flight of an aircraft will require an in-depth consideration of the airworthiness aspects involved in including it in the approved type design.

d. **Stage of Development.** The design change certification process normally begins as soon as possible in the development of the design change so that the appropriate influences on the design can be made while it is still feasible and an acceptable process can be chosen to assure airworthiness. However, in many cases design development will have progressed past the detail design stage or in fact may have been completed before the design change certification process commences. Although not ideal, the design change certification process can commence at any stage of design development. In the later stages of design development, it just means that certification requirements will have less of an influence on the development process and some analysis and testing work may have to be repeated in order to meet the necessary certification requirements. This is often the case where a design change has received airworthiness approval for incorporation in one approved type design and is being considered for an application in another approved type design.

e. **Potential Safety Risks.** A proposed design change may introduce new hazards or increase the risk (probability and/or severity) of existing hazards in an approved type design. This is particularly important if the proposed design change is affecting a part or a function that is considered essential to the safe flight of an aircraft. A hazard is defined as a characteristic of a design, its operation or its environment that is potentially dangerous. In other words, a hazard can lead to an accident or incident with negative consequences.

f. **Previous Certification Activity.** A design change that has received an airworthiness approval for incorporation in a similar approved type design may significantly reduce the effort necessary to meet the certification requirements. In these situations, the certification process can be tailored to make maximum use of previous certification activity provided:

(1) The previous certification authority is acceptable to the TAA; and

(2) The application of the proposed design change is applicable to the aeronautical product considering such factors such as the design, the host aeronautical product and the operating use and environment.

g. **Service Experience.** Service experience of the Design Change in a similar aeronautical product may be used to support the certification of a proposed design change if analysis shows sufficient similarity between the two configurations, the service history to be applicable and changes to the referenced system configuration have been appropriately controlled and documented. The similarity argument gains strength as the period of service experience increases and if no unresolved significant problems have been experienced.

h. **Maturity of Technology.** The use of innovative design trends or emerging technology can present problems during certification. The inadequacy of existing airworthiness standards or the non-existence of applicable airworthiness standards and the lack of precedent often will necessitate additional effort and time during the planning stages. The process may move considerably slower until confidence is obtained that an adequate level of safety can be assured. Furthermore, limitations and restrictions may be imposed during the initial operational period until experience with the complexity or application of the technology is obtained.

i. **Availability and Source of Type Design Data.** Incorporation of a design change generally requires knowledge of the existing Certification Basis for the approved type design into which incorporation is intended. In addition, details of the proof of compliance to this Certification Basis will facilitate the airworthiness certification of the proposed design change.

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3. **Certification Requirements.** The airworthiness-related activities that must be performed for the certification of a proposed design change are the certification requirements that are considered necessary for the incorporation of a particular design change in a specific aeronautical product approved type design. The certification requirements for a proposed design change may originate from the following:

a. System safety program requirements, including determination of safety goals and assignment of safety targets to particular parts of the design; and

b. Design assurance requirements.

4. **Certification Strategy.** The manner in which a proposed design change proceeds through the various airworthiness-related activities to satisfy the identified certification requirements is known as the certification strategy for the particular design change. The Technical Airworthiness Program incorporates flexibility in the selection of a certification strategy to accommodate variations in the certification requirements for each individual design change and the potential effects on the airworthiness of the aeronautical product approved type design in which incorporation is intended.

5. The certification strategy for a particular design change must establish:

a. a framework for the airworthiness-related activities including integration with the design development process;

b. the co-ordination and communication links between the airworthiness regulator and the applicant of the proposed design change; and

c. a level of confidence that an acceptable level of safety will be adequately demonstrated.

6. The proposed certification framework for the various airworthiness-related activities involved for a particular design change is vital to the overall success of the design change certification process. Since certification planning commences early in the development of the proposed design change detailed information may not be available. Therefore, the framework must be flexible enough to permit changes as the design change development progresses. Appropriate feedback loops must be provided to ensure new certification requirements are adequately addressed as they are identified for the proposed design change.

7. The coordination and communication links established between the regulator and the applicant of the proposed design change are vital to the overall success of the design change certification process. The regulator is the TAA or the individuals authorized to act on behalf of the TAA, who provide the necessary airworthiness certifications. The applicant is the individual or organization who develops the proposed design change and plans its incorporation into the approved type design. Effective links provide a level of assurance that the selected certification strategy will result in the necessary airworthiness certification of the proposed design change. Furthermore, it minimizes delays in the development and certification of the proposed design change and eliminates duplication of effort.

8. The selected certification strategy must provide a level of confidence that upon completion of the certification process an acceptable level of safety has been clearly demonstrated for the incorporation of the proposed design change into the existing approved type design for the aeronautical product. This includes the means of compliance, the methods of demonstrating compliance, and the integration of the certification process with the design assurance requirements in the development process for proposed design change This is particularly important in the development or modification of software where the development process must be controlled to provide the necessary assurance that the software satisfies the aviation safety requirements.

9. **Certification Planning Considerations.** In order to assess the amount of effort involved in putting a design change through the entire process as described in Part 3, Chapter 2, a number of areas should be examined. There is no particular order involved, rather the purpose is to assemble as complete a picture as possible as soon as possible. It is also worthwhile to look beyond the attainment of design change approval to the introduction to service

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in order to "pre-position" some data and documentation which may be generated during the design change approval process. Some of the areas concerned are as follows:

a. Elements affecting the certification requirements;

b. Outlining the certification strategy;

c. Impact on the preparation of a certification plan; and

d. Requirements for approval of the certification plan by the TAA or an authorized individual.

10. **Elements Affecting the Certification Requirements.** The certification requirements for a proposed design change depend on a number of factors as described in detail in 3.2.3.3.2.

11. It is important to determine if any existing systems safety assessments for the aeronautical product approved type design are available and whether it will be necessary to conduct a new safety assessment. Aspects to consider include whether the existing safety goals are adequate or if new safety goals should be set and safety targets assigned.

12. If the design change is new and not yet developed, the opportunity exists to influence the design by providing design assurance requirements that must be accomplished during the actual development of the design change. This may include but is not limited to:

a. participation in preliminary and critical design reviews;

b. independent validation and verification;

c. systems safety reviews;

d. software development process controls; and

e. DCB (if applicable).

13. Several formal technical airworthiness functions performed by the TAA or authorized individuals on behalf of the TAA will be required to assure the airworthiness of both the approved type design and in-service aeronautical products with the proposed design change incorporated. This includes, but is not limited, to the performance of the following technical airworthiness functions as described in Part 1, Chapter 3:

a. Finding of compliance; and

b. Airworthiness approval.

14. Prior to introduction into service use, a requirement exists to obtain an operational airworthiness clearance from a person authorized by the OAA. Early coordination and cooperation with the appropriate operational staffs are essential. This ensures the required operational airworthiness-related activities and tasks are completed in a timely and effective manner. This may include a review by the appropriate operational staffs of aspects of the proposed design change, such as:

a. the effects on operating characteristics of the aeronautical product, including design operating limitations and restrictions;

b. normal operating and emergency procedures;

c. amendments to the Aircraft Operating Instructions (AOI) and associated aircrew publications; and

d. aircrew training.

15. The airworthiness certification of a proposed design change requires an assessment against the criteria specified in the certification standard(s) which apply for the particular aeronautical product approved type design with the proposed design change incorporated. This may include program-related airworthiness standards or product-

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related airworthiness standards. As stated in 3.2.3.3.1, the collection of the applicable certification standards for a particular design change is known as the Certification Basis for that design change. The selection of the Certification Basis shall be done in accordance with 3.2.2.S2.

16. **Outlining the Certification Strategy.** As described in 3.2.3.3.4, the certification strategy defines the intended approach to the airworthiness certification of the proposed design change including the framework of certification activities, the communication links between the airworthiness regulator and the applicant of the proposed design change and the means of compliance. The certification strategy is developed specifically for each particular proposed design change and must be flexible to accommodate changes as the development of the design change progresses. The certification strategy for a proposed design change is influenced by the following four main factors:

a. The category of the proposed design change determined by an assessment of the effects on the airworthiness of the approved type design of the aeronautical product by the incorporation of the proposed design (refer to 3.2.3.1);

b. An assessment of the extent of the proposed design change from a complexity and/or magnitude perspective;

c. The introduction of new hazards or a change to existing hazards that may affect the safe flight of an aircraft; and

d. The source of the airworthiness certifications or the data to support the demonstration of compliance with the applicable airworthiness standards.

17. **Impact on Certification Plan.** The results of certification planning are documented in a certification plan that will be submitted as part of the formal approval process (see Figure 3-2-1-2). Agreement on the certification plan between the airworthiness regulator and the applicant for the proposed design change provides reasonable assurance that the design change certification process will be successful and all necessary airworthiness certification requirements will be satisfied.

18. The certification plan should address the proposed design change from both a design and an operating environment point of view. The amount of detail contained in the plan depends on the category of the proposed design change and the complexity of the certification strategy to be followed for the selected process.

19. Since the design change certification process depends on the design development process, information may not be immediately available for all aspects of the certification plan. However, early coordination of planning is essential to ensure success even though significant detail may be missing. Subsequent updates to the plan can provide the necessary information as it becomes available.

20. The certification plan requirements are provided in 3.2.2.S3 and include:

a. The purpose, scope, constraints and assumptions and the applicable definitions of the certification program;

b. The identification of the aeronautical product to which the proposed design change applies, including make, model, registration number and type certificate as applicable;

c. A description of the proposed design change, including its effects on component, system and aircraft operation or functions. The description should address hardware, software and interrelationship aspects affected or introduced by the proposed design change. The following should be included:

(1) Use and operating environment applicable to the change,

(2) The type of change, such as modification or alteration, change to approved maintenance program, or change to an approved role, mission or task,

(3) The category of the proposed design change,

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(4) General details, such as principal design features, operating characteristics, and airworthiness limitations, and

(5) Any novel or unique design features including the use of any new technology or technology applications.

d. A summary of the identified potential hazards to the safe flight of an aircraft;

e. A summary of the safety requirements, including safety objectives or targets and safety assessment method;

f. If applicable, a description of the process for the selection and submission of the Certification Basis, including:

(1) selection of the applicable airworthiness, noise and environmental standards, in accordance with 3.2.2.S2,

(2) identification of areas where the potential exists for a request for a TAA exemption and/or deviation, in accordance with 3.2.2.S2,

(3) identification of areas where the need for special conditions are anticipated, in accordance with 3.2.2.S2,

(4) identification of areas where a finding of equivalent safety may be necessary for a means of compliance as described in 3.2.2.S4, and/or

(5) identification of areas where credit for previous design change certification by other airworthiness regulatory agencies is intended.

NOTE

In many cases the design change will be the subject of a contract. In this case, the Certification Basis must be agreed to the fullest extent possible in order to minimize contract changes. Again, early and detailed discussion between the applicant and the TAA will help to ensure that the proposed Certification Basis in the contract is suitable and acceptable.

g. Outline the certification strategy to address the major airworthiness-related activities, responsibilities, organizational relationships and schedule;

h. If applicable, outline the compliance program, including the intended use of any design assurance techniques such as a formal safety assessment or system safety program, design reviews and design validation and verification. An important aspect of the compliance program is the intended means and methods of demonstrating compliance. Therefore the outline of the compliance program should include a description of:

(1) the compliance matrix as specified in 3.2.2.S4.2,

(2) the process for assignment of technical airworthiness authority to personnel to make findings of compliance on behalf of the TAA, and

(3) the proposed methods for tracking compliance progress.

i. Provide a list of deliverables and a description of the process for the development and submission of the required airworthiness documentation, in accordance with 3.2.2.S5, including a description of the requirement for:

(1) ICA amendments or supplements,

(2) Flight manual or operating instruction amendments or supplements,

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(3) Function and reliability requirements and any associated test programs, and

(4) Any anticipated flight authority requirements, including temporary flight authority (i.e., the issue of experimental flight permits).

21. The form that the certification plan takes and the content depends on the requirements of the particular design change and the circumstances involved. In certain situations it may be a detailed report whereas in others an outline may be provided with reference to subordinate plans.

22. **Requirements for Certification Plan Approval.** The certification plan is submitted for approval to the airworthiness regulator (i.e., TAA, or authorized individual) who will eventually grant airworthiness approval to the proposed design change. As a guide this would normally be as follows:

a. **Major Design Change.** The certification plan may be approved, in accordance with 3.2.2.S6 by an authorized individual who has been assigned the scope and depth of technical airworthiness authority to grant airworthiness approval on behalf of the TAA for a major design change; and

b. **Major Design Change Deemed Extensive.** The certification plan is approved by the TAA or an individual appointed by the TAA as chairman of the DCB and specifically authorized to approve the certification plan for the particular design change. The chairman of the DCB may be a member of the TAA staff or another specific individual selected by the TAA.

23. Approval of the certification plan signifies agreement between the airworthiness regulator and the applicant for the proposed design change regarding the airworthiness certification process to be followed for the particular proposed design changes. It provides reasonable assurance that all airworthiness certification requirements will be satisfied if the agreed plan is followed. Future amendments to the plan may be necessary to account for new certification requirements discovered during the design development process and airworthiness certification process. All amendments to the certification plan should be submitted for approval to the individual who initially approved the plan as soon as possible.

3.2.3.4 Design Change (Certification Basis) Selection

1. The selection of an appropriate Certification Basis is central to the design change certification process. A Certification Basis consists of certification standards (taken from certification codes such as CARs, FAR, DEF STAN 970, etc.) that must be met by the applicant to assure that an acceptable level of safety is achieved for the aeronautical product with the design change incorporated. Each of the standards is comprised of one or more certification requirements that must be met to substantiate the standard.

2. In conducting a design change, the Applicant must have a sound understanding or knowledge of the certification standards used to certify the original type design. A proposed design change to an original product must take into consideration the effect of the change on each of the certification standards identified in the original Certification Basis. The original product with the design change incorporated must still meet an acceptable level of safety. In the case of commercial pattern aircraft (i.e., CT142, CC150, CC144, CC138, etc.), the establishment of the Certification Basis for the proposed design change is fairly straight forward since the certification standards (FAR 23/25) are clearly identified. (For non-civil pattern aircraft and those for which no clear Certification Basis is available, 3.2.3.4.4, provides guidance on selecting an appropriate Certification Basis.) An assessment of the adequacy of the original Certification Basis for use in certifying the design change will still have to be performed focussing on:

a. whether the breadth of the Certification Basis certification standards is adequately comprehensive; and

b. whether the certification requirement(s) identified in each certification standard are appropriate and comprehensive.

3. Questions that the applicant should be asking when determining the Certification Basis are as follows:

a. **What is the original Certification Basis for the product undergoing the design change?**The original Certification Basis will establish the minimum standards for the design change, unless the design change introduces any new design features or functions that cannot be addressed by the original Certification

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Basis. The Certification Basis can be found in the Type Certificate Data Sheet (TCDS), as will be any additional technical conditions and/or additional documents referenced. While it is often acceptable to consider the design change of an existing system using the standards to which it is originally built, this may have inherent risks. Most standards or specifications are updated as a result of identified or perceived weaknesses. Applicants are strongly encouraged to consider the inclusion of the most recent standards during the design definition for this reason. The onus is on the applicant to ensure that when an older standard is used in place of a more current replacement or updated standard that the substantiation for using the older standard is formally documented.

b. **Are additional standards required?** Additional standards may be required to ensure that the approved type design with the design change incorporated provides a level of safety equivalent to that provided by the standards recorded in the current TCDS. The additional standards may include:

(1) standards specified by the TAA, and

(2) a proposed standard where:

(a) no TAA specified standard applies to the proposed design change;

(b) the proposed design change incorporates novel or unusual design features; and/or

(c) the proposed standard provides a level of safety equivalent to the level that would result from compliance with the TAA specified standards for similar design changes.

c. **Are there any novel or unusual features?** Special conditions may have to be identified by the applicant and approval sought from the TAA to cater for novel or unusual features of a design change that are not already addressed as part of the Certification Basis.

d. **Will I need to request Equivalent Safety items?** The applicant may wish to make an equivalent safety argument that will have to be approved by the TAA.

e. **Am I requesting any exemptions or deviations?** A design change for special purpose operations may make some airworthiness requirements unnecessary or only partially applicable (i.e., airworthiness requirements for the passenger compartment may not be necessary or may be partially applicable if the aircraft is going to be used for missions or roles that do not include carrying passengers).

f. **Are there other airworthiness rules to meet?** A design change may require that standards that have been put into place to address other specific requirements be added to the Certification Basis This could include such things as special flammability requirements for seat cushions, or requirements for specific equipment to be carried (ELT, FDR/CVR, ALSE, TCAS, etc.).

g. **Are there environmental regulations to meet?** Does the design change require the addition of standards to meet exhaust, fuel venting and noise emission airworthiness requirements?

4. **Aircraft Without an Original Certification Basis.** For those military pattern aircraft that were produced to or qualified against a weapon system specification, the airworthiness standards are generally embedded within the specification as a whole. In order to know what the original airworthiness standards are for the original aeronautical product, a dissection of the weapon system specification may have to be performed to identify those standards that form the aeronautical product Certification Basis. The designer must also determine what systems/interfaces will be affected by the proposed design change. Depending on the extent of the design change, the designer may choose to create a partial Certification Basis for those areas affected by the design change. The designer can then expand the definition of the aircraft Certification Basis, over time, as more design changes are necessary. It may be recognized that the aircraft specification does not address all areas affected by the proposed design change, and airworthiness standards will have to be proposed in order to maintain the validity of the type design.

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5. In the case of the CP140 Aurora, an aircraft that does not have a Certification Basis, an approach was devised to establish a Certification Basis for a package of design changes. The methodology required that the weapon system specification be arranged to present aircraft information according to groups. See Figure 3-2-3-1.

Group	Title
3.1	Characteristics
3.2	General Arrangement
3.3	Aerodynamics
3.4	Structural Design Criteria
3.5	Wing Group
3.6	Tail Group
3.7	Body Group
3.8	Alighting Gear
3.9	Alighting Gear (Water Type)(Not Applicable)
3.10	Flight Control Subsystems
3.11	Engine Section of Nacelle Group
3.12	Propulsion
3.13	Auxiliary Power Plant
3.14	Instruments
3.15	Hydraulic and Pneumatic Subsystems
3.16	Electrical
3.17	Electronics
3.18	Armament
3.19	Furnishings and Equipment
3.20	Air Conditioning and Anti-icing Equipment
3.21	Photographic Capability
3.22	Auxiliary Equipment and Requirements

Figure 3-2-3-1 Weapon System Specification Arranged in Groups

6. A comprehensive list of standards that were referenced throughout the CP140 weapon system specification was then made. The list contains references to all of the MIL Specifications, MIL Standards, MIL Handbooks, and CFTO documents that are cited in the aircraft specification. Using these lists, a Certification Basis for the CP140 design change was partially determined as follows:

a. The applicant identifies the weapon system specification groups that are relevant to or affected by the proposed design change;

b. The applicant then searches the paragraphs of the identified groups in order to determine which paragraphs of the groups apply;

c. The paragraphs are cross-referenced to the comprehensive standards list; and

d. The standards that are related to airworthiness are identified and grouped together to form a proposed Certification Basis.

7. In order to produce a complete Certification Basis, the following items must be considered for inclusion, in addition to the Certification Basis that has been derived from the aircraft specification:

a. A list of additional airworthiness standards that are required to ensure the changed type design provides a level of safety equivalent to that of the original;

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b. Noise, fuel venting and engine emission standards;

c. Special conditions required by the TAA;

d. Standards elected by the applicant (later amendment to existing standards); and

e. Exemptions and/or deviations sought from the TAA.

8. It should be noted that any assumptions made in determining the Certification Basis must be stated and justified. Preferably, the determination of the Certification Basis should be performed by two independent, experienced designers who are familiar with airworthiness standards and aviation practices.

9. In a second example of creating a Certification Basis for legacy aircraft, the Australian Defence Force (ADF) has developed a generic Certification Basis for in-service fixed wing aircraft. They have created a table that provides a suggested set of certification requirements that have been sourced primarily from DEF STAN 00-970. The requirements were also compared to FAR 23/25 to further assure the comprehensiveness of the list of standards. They found a high degree of correlation between the general requirements of the DEF STAN and FAR 23/25, however, there were several FAR 23/25 requirements that did not have a direct counterpart in DEF STAN 00-970. These FAR requirements were added to the generic Certification Basis. For a proposed design change, a partial Certification Basis can be created appropriate to the scope of the change by assessing which of the certification items in the table of generic requirements could potentially be impacted by the design change. Then the following steps are carried out:

a. Remove any topics listed that are not relevant to the particular aircraft type (most likely this has already been done in determining which certification items apply for the design change);

b. For each remaining item, determine how each could be assessed to assure an adequate level of safety. It may be appropriate to use more modern design standards or alternate means for older aircraft; and

c. The Certification Basis should be considered complete when it enables a comparison between the level of safety inherent in an aircraft design both before and after any design change.

10. More information is available in Australian Air Publication 7001.054 (AM1) Airworthiness Design Requirements Manual.

11. These are only two examples of how a Certification Basis can be created for in-service aircraft that do not already have one. The TAA should be engaged during the strategic planning for the development of a Certification Basis from a weapon system specification in order that the approach may be assessed as meeting the requirements for a comprehensive set of airworthiness standards.

3.2.3.5 Design Change Compliance Program

1. **Introduction.** The compliance program is an essential tool to manage the design change certification process. It includes activities and products that systematically and comprehensively prove compliance with each of the certification requirements of the selected Certification Basis. A compliance matrix is central to the conduct of a compliance program and is submitted by the applicant to the TAA containing:

a. Detailed, itemized certification standards;

b. Proposed means and methods of compliance by item;

c. Test and report submission (proof of compliance); and

d. A record of who will (has) make (made) findings of compliance.

2. **Compliance Matrix.** The compliance matrix is a living document. Its content may change as the design change certification progresses (i.e. due to design development, inappropriate means of compliance, changes in assignment of authority, etc.), however the structure and format shall remain the same. Once the compliance matrix becomes

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fixed and is signed off, it becomes the Compliance Record, which is the detailed findings and means of compliance of the design change against its Certification Basis.

3. It is customary to submit the compliance matrix to the TAA as part of the certification plan. A typical matrix is represented in Figure 3-2-3-2. Normally, the information required in columns 1 to 4 and 6, is provided as part of the certification plan matrix submission.

4. **Findings of Compliance.** A finding of compliance is certification that a specific aspect of a proposed change to an approved type design complies with the applicable certification standards identified in the Certification Basis. Each requirement listed in the Certification Basis requires one or more findings of compliance before airworthiness approval may be granted.

5. A finding of compliance must be performed by the TAA or an authorized individual. An individual may be assigned technical airworthiness authority to make findings of compliance by the TAA in the approved certification plan or by an authorized individual in a TAA-Acceptable Organization in accordance with Part 1, Chapter 4. Authorized individuals include:

a. An individual assigned technical airworthiness authority in accordance with Part 1, Chapter 4, to make a finding of compliance on behalf of the TAA;

b. An individual assigned technical airworthiness authority as a member of TAA staff; and

c. An individual authorized in the certification plan as a finding authority for a specific compliance program.

6. **Type Design Examination (TDE)**. TDE may be performed by the TAA or an authorized individual. Individuals who are members of an Acceptable Organization and are authorized to approve design changes may also be authorized to perform TDE activities. Where the design change approvals are conducted in accordance with an approved certification plan, the plan may include an assignment of authority for TDE activities.

7. **Finding of Compliance Process.** The process involved in making a finding of compliance will vary somewhat depending upon the certification requirement, the aspect of the design change, the means and methods used to demonstrate compliance, and the required proof of compliance. The process may be tailored to meet the particular aspects of the situation for the proposed design change involved.

8. The primary steps in the process leading up to making a finding of compliance include, but are not limited to, a review of the following:

a. Proposed design change;

b. Airworthiness certification standard;

c. Means of demonstrating compliance; and

d. Proof of compliance.

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COMPLIANCE MATRIX

Airworthiness Certification Standard	Certification Requirement	Means of Compliance	Method of Compliance	Proof of Compliance	Finding Authority	Finding Result	Date	Signature
FAR 25.335 Dated XXXX 1	Design Airspeeds 2	Analysis and Test 3	AC 25.335 -1A Design Dive Speeds 4	Report #123 Dated XXXX 5	Mr. I.M. Finder 6	Compliant 7	1 Oct 2002 8	I.M. Finder 9

NOTE

As specified in 3.2.2.S4.2, the information is a compliance matrix is as follows:

1. Identification, revision number and date of the applicable airworthiness certification standard;

2. A description of the airworthiness certification requirement;

3. The selected means of demonstrating compliance (usually description, analysis and/or test);

4. The methods of compliance (certification guidance material,i.e. advisory circulars, test plans etc.);

5. The proof of compliance including reference to any substantiating data or report;

6. Identification of the finding authority, the individual authorized to make a finding of compliance on behalf of the TAA;

7. A declaration of whether the proof of compliance demonstrates compliance or not;

8. The date of making the finding; and

9. The signature of the finding authority.

Figure 3-2-3-2 Typical Compliance Matrix

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9. **Design Change Review.** A review of the design change may be necessary to determine the boundaries of the particular finding of compliance, the scope and depth of technical airworthiness authority required and the need for specialist advice or supplementary findings. The review should include:

a. The existing operation and usage of the aeronautical product and any intended changes with the incorporation of the proposed design change;

b. The existing Certification Basis for the approved type design and the approved Certification Basis for the design change (the approved Certification Basis for the design change may continue to require amendments up to the point when airworthiness approval is granted). Every amendment to the Certification Basis must be approved by the TAA; and

c. The design detail and technology applicable to the particular finding of compliance for both the aeronautical product as specified in the existing approved type design and the proposed design change.

10. Upon completion of the review it should be possible to answer the following questions (Additional questions may be applied by the TAA):

a. Is the proposed design change within the scope and depth of my assigned technical airworthiness authority?

b. Is the proposed design change within my self-assessed competency?

c. Do I need to seek specialist advice necessary to make the finding of compliance?

d. Is a supplementary finding or supporting finding necessary prior to making a finding of compliance? (for example, is a review of an engineering analysis required by another authorized individual, or is a flight test evaluation required by an authorized test pilot)?

11. **Airworthiness Certification Standard.** The review of the applicable certification standards listed in the Certification Basis for the design change is necessary to determine the adequacy of the certification requirement as listed in the Certification Basis and the appropriateness of the selected certification standard. Particular attention should be paid to the revision status of the listed standard and whether the appropriate amendment has been included. Experience with similar design changes or the incorporation of the same design change in other approved type designs may provide valuable information.

12. Upon completion of the airworthiness standard review it should be possible to answer questions including but not limited to the following:

a. Is the selected certification standard listed in the Certification Basis for the proposed design change appropriate?

b. Is the certification requirement as stated in the compliance matrix adequate?

c. Is the amendment status for the selected certification standard appropriate?

d. Does the airworthiness standard or associated advisory material provide guidance regarding means and/or methods of compliance for the particular certification requirement?

13. **Means of Compliance.** The review of the means for demonstrating compliance for the particular certification requirement is necessary to determine its appropriateness. The three basic means of demonstrating compliance are description, analysis or test. Selection of an appropriate means for each requirement in the Certification Basis depends on the minimum effort necessary to prove compliance unless a particular means is specifically stated in the applicable airworthiness standard, such as ".... must be shown by test....". For example, analysis is normally selected rather than test for cost reasons, provided an analysis can adequately demonstrate compliance for the particular

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requirement. Various TC Airworthiness Manual Advisories (AMA) and FAA Advisory Circulars (AC) provide guidance on the selection of an appropriate method of compliance. Examples for each means of compliance are as follows:

a. **Description.** Engineering inspection, vendor data and statement, service experience, drawing or evidence of approval such as FAA / Technical Standard Orders;

b. **Analysis.** Failure modes and effect analysis (FMEA), structural loads analysis, stress analysis, electrical load analysis and software evaluation and documentation; and

c. **Test.** Flight test, ground test, fatigue test, simulation, fire test, environmental test and functional test.

14. Although not included as means of compliance (but they are noted on the compliance matrix) are the items included as part of the Certification Basis that do not require compliance such as:

a. Exempt (by exemption granted);

b. Deviation (by deviation granted);

c. Equivalent safety issued;

d. Not applicable (to the design of the product); and

e. Noted (by example).

15. Upon completion of the means of compliance review it should be possible to answer questions including but not limited to the following:

a. Will the proposed means appropriately demonstrate compliance with the airworthiness standard listed in the Certification Basis for the particular certification requirement involved from an adequacy, completeness and accuracy perspective?

b. Is test witnessing required?

c. Should the TAA perform an independent verification of the results?

d. Will proof of compliance data or information be provided?

16. **Method of Compliance.** The method of compliance expands upon the means of compliance by providing detailed information about how compliance will be demonstrated. The method of compliance refers to a procedure (for example, test plan) that contains the following information:

a. the specific (or worst case) conditions required to demonstrate compliance;

b. any critical assumptions used;

c. the pass/fail criteria (usually associated with 'test' as a means of compliance);

d. an explanation of what specific levels of performance a system or component must attain to be in compliance; and

e. any other information considered important in describing how compliance is to be demonstrated.

17. **Proof of Compliance.** The review of the proof of compliance data and/or information is necessary to determine if sufficient evidence exists to satisfactorily demonstrate compliance with the airworthiness standard listed in the Certification Basis. This may involve availability, accessibility, completeness, adequacy and accuracy of documentation.

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18. Upon completion of the proof of compliance review it should be possible to answer questions including but not limited to the following:

a. is all the required proof of compliance documentation available to make a finding of compliance?

b. will the proof of compliance documentation be available for future reference?

c. is the documentation adequate and accurate?

d. is an independent Airworthiness Review, as described in 1.3.1.8 required?

e. do you feel confident with making a finding of compliance for the airworthiness requirement and recommending airworthiness approval of the proposed design change?

f. should any TAA special conditions be added to the Certification Basis for the proposed design change?

g. should any design operating limitations or restrictions be imposed?

h. are there any continuing airworthiness concerns that should be considered during TAC of the proposed design change or in-service monitoring of aeronautical products with the proposed design change incorporated?

i. should an airworthiness limitation be imposed (i.e., assignment of a life limit or certification maintenance requirement)?

j. is there a concern regarding the flight manual?

19. There are two situations where an individual, external to the TAA staff, would normally not be authorized to make a finding of compliance on behalf of the TAA. The first is if the individual is required to make a subjective assessment (i.e., Findings of Compliance made without full substantiation being available or existent) in order to certify the finding of compliance. The second is if the Finding of Compliance involves one or more of the following:

a. Structures:

(1) Basic loads analysis;

(2) Structural test programs;

(3) Airframe fatigue and damage tolerance calculations; and/or

(4) Loads predicted by aerodynamic analysis.

b. Propulsion:

(1) Engine or propeller test programs;

(2) Engine or propeller icing programs; and/or

(3) Engine mounts.

c. Flight Sciences:

(1) Flutter and dynamic analysis; and/or

(2) Stores clearance.

d. Mechanical, electrical or avionics systems:

(1) Occurrence of any fault condition in an equipment, system, or installation that would prevent safe flight and landing of an aircraft (i.e., XX.1309).

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e. Software:

(1) Occurrence of any fault condition in an equipment, system, or installation that would prevent safe flight and landing of an aircraft.

f. Maintenance Programs:

(1) Airworthiness limitation; and/or

(2) Replacing the primary source document used to develop the maintenance schedule as defined in Part 5, Chapter 3.

g. Flight manual or flight manual supplement:

(1) Operating limitations;

(2) Operating procedures;

(3) Performance information; and

(4) Loading information (refer to 2.7.2.S1, for flight manual contents).

h. Equivalent Safety.

i. Exemptions and/or deviations.

j. Special conditions.

20. In summary, a finding of compliance certifies that:

a. The airworthiness design standard for the specific requirement is appropriate;

b. The means of demonstrating compliance is appropriate; and

c. The proof of compliance is adequate.

21. **Recording of Finding of Compliance.** The results of the finding of compliance process are normally recorded in the compliance matrix for the proposed design change. The compliance matrix should be reviewed for accuracy and completeness of the following:

a. The airworthiness requirement description;

b. Identification, revision number and date of the applicable airworthiness standard;

c. The method(s) of demonstrating compliance;

d. The proof of compliance including reference to substantiating data or reports; and

e. Identification of the finding authority.

22. When it is determined that all of the information is satisfactory; the finding result, date and signature are entered on the compliance matrix by the authorized individual who was appointed as the finding authority for the compliance program. The finding result may take the form of the following or as directed by the individual who will grant airworthiness approval:

a. Compliant;

b. Provisional compliance with reference to a report or issue paper; or

c. Non-compliant.

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PART 3
CONTINUING AIRWORTHINESS

CHAPTER 3 - IN-SERVICE AERONAUTICAL PRODUCT CONFIGURATION MANAGEMENT (CM)

SECTION 1

INTRODUCTION

3.3.1.1 Background

1. Configuration Management (CM) is an important aspect of the overall management activities for both an approved type design and the actual in-service aeronautical product. This is particularly true for a complex aeronautical product such as an aircraft type that involves a multitude of systems, sub-systems, components and other related equipment. Within the Technical Airworthiness Program, CM is considered essential in assuring the airworthiness of in-service aeronautical products, and therefore, formal CM is required for military-registered aeronautical products. CM asserts structure and control over the introduction of design changes to in-service aeronautical products. The essence of CM is its disciplined approach to managing product characteristics and changes.

2. In the context of airworthiness, it is important to understand the terminology outlined below.

   a. **Configuration** is the functional and physical characteristics of hardware, firmware and software or a combination thereof as set forth in technical documentation and achieved in an aeronautical product;

   b. **Software Considerations.** Misconceptions often arise from the lack of physical characteristics associated with software. Within the CM concept, when reference is made to the physical characteristics of software, it is to be considered as its executable image/code, or the distinct binary state of software when it is ready to be loaded into the target system;

   c. **Configuration Item (CI)** is defined as an aggregation of hardware and/or software that satisfies an end use function, and is designated for CM control. It is the aeronautical product controlled under the CM process and may be called a Hardware CI (HWCI) or Computer Software CI (CSCI); and

   d. **Configuration Management** is the discipline that applies technical and administrative direction and surveillance on the configuration(s) and changes to the configuration(s) of aeronautical products throughout their life cycle. The CM process consists of four basic elements:

      (1) Configuration Identification;

      (2) Configuration Control;

      (3) Configuration Status Accounting; and

      (4) Configuration Audits.

3. Regardless of the complexity of the aeronautical product that is under CM, all four elements will be performed to some extent throughout the life cycle of the aeronautical product.

3.3.1.2 Elements of the CM Process

1. **Configuration Identification** identifies and documents the functional and physical characteristics of CIs. The purpose of configuration identification is to establish and maintain a definitive basis for control and status accounting of a CI throughout its life cycle. This begins with the selection of CIs, where identifiers are allocated and reflected in the technical documentation, including specifications, drawings and interface control documents, which define the functional and physical characteristics of an item or group of items. An aeronautical product such as an aircraft type design is considered the top level CI which is divided into functional or physical breakdowns of lower level CIs.

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2. CIs are identified following a logical system, often based on Air Transport Association of America (ATA), Association européenne des constructeurs de matériel aérospatial (AECMA) and other equivalent standards. The initial baseline configuration(s) for the aeronautical product is therefore created, as defined and described by the configuration documentation and provides precise engineering design reference points for each identified CI. Once the type design of an aeronautical product has been granted airworthiness approval in accordance with Part 2, Chapter 1, the baseline configuration(s) for the aeronautical product type is formally established. During the in-service life of the aeronautical product, baseline configuration(s) may be amended as a result of design changes.

3. **Configuration Control** manages the changes to CIs and their related documentation. Configuration control is the systematic proposal, justification, evaluation, coordination, approval or disapproval of proposed design and/or configuration changes to the approved type design, and the implementation of all approved design and/or configuration changes to a CI that has an established configuration baseline(s).

4. **Configuration Status Accounting** records and reports information needed to manage CIs effectively, including the status of proposed design or configuration changes and the implementation status of approved design or configuration changes. Configuration status accounting provides records of the approved configuration documentation for a CI and the actual configuration status of all in-service aeronautical products.

5. **Configuration Audits** audit CIs to verify conformance to specifications, drawings, interface control documents and other contract requirements. Configuration audits determine or verify conformance of the "as-built" aeronautical product against its approved type design or baseline configuration documentation. This activity is particularly relevant to the development of a new aeronautical product or a subsequent design change to the approved type design of an aeronautical product.

3.3.1.3 CM Process Implementation

1. NDHQ Policy Directive P1/91 Configuration Management Policy for Defence Systems is the publication directing DND/CAF units to apply CM to Defence Systems, including aeronautical products. Where non-DND organizations are not contractually tied to follow the DND Policy, other publications such as MIL-HDBK-61A, ISO 10007 and other equivalent standards also provide guidance material on the preparation of Configuration Management Plans (CMP) and the implementation of acceptable CM practices. CMP are actually the means to document the details of individual CM programs, and need to be tailored to the various phases of the life cycle of an aeronautical product. The CM program for a particular aeronautical product may, therefore, be divided into distinct phases with transition periods in between, but which still implements to some extent all elements of the CM process (identification, control, status accounting and audits).

2. **Continuing Airworthiness (In-service) CM.** For most modern aeronautical product type designs, changes to the originally designed, documented and approved configuration(s) as defined by the approved type design are inevitable while the aeronautical product type is in service. Therefore, the implementation and application of a CM process is considered essential to assure the continuing airworthiness of in-service aeronautical products. The CM program may be tailored to satisfy the management of design change, product conformance and product support requirements. The in-service CM process is an integral part of the design change process employed by an organization and satisfies the airworthiness design change certification process of Part 3, Chapter 2. The in-service CMP is the means to detail how CM activities will be conducted during the in-service phase and typically consists of the following tasks:

a. identification of new CI including the authentication of the associated specifications, drawings and other configuration documentation and the definition of the current approved configuration(s) as defined by the approved type design;

b. exercising change control over the approved type design and the approved configuration(s) including both proposed and approved design changes and configuration changes;

c. recording the configuration data which provides the status of the current approved configuration(s) as defined by the approved type design and the actual in-service products, and the proposed and approved changes; and

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d. providing an audit trail from the original design specification to the current approved configuration(s) of the in-service products.

3.3.1.4 Configuration Management Plan (CMP)

1. A CMP consists of all policies, procedures, organizational descriptions and scheduled events related to CM. A CMP describes the CI to which it refers, the procedures for CM application, all CM tasks, CM participants and their roles. As the CI progresses through the various phases of its life cycle, the content of the CMP should be revised and include historic as well as updated planning and procedural information.

2. **In-service CMP.** Before an aeronautical product type is released to service, the in-service CMP is prepared and submitted to the TAA for review, as required by Part 2, Chapter 3, for the TAC of the approved type design. The in-service CMP must be in line with the CM data obtained from the Original Equipment Manufacturers (OEM). The Configuration Control Authority (CCA) for the approved type design is the approval authority for the in-service CMP, and shall determine the requirement for other organizations involved in the management of the approved type design to have subordinate CMP. All applicable CMP shall be included by reference in the in-service CMP of the Acceptable Organization responsible for the CM of the aeronautical product. Where an organization is involved with multiple aeronautical product types, one CMP is acceptable if commonality exists in the respective CM practices to be applied to these aeronautical products.

3. **Subordinate CMP.** Where it is determined that subordinate CMPs are required for in-service aeronautical products, they are to follow a format that is compatible with the in-service CMP for the applicable TAA-approved type design. Authority for approval of subordinate CMPs is vested with the CCA, as described in 3.3.1.4.2. Subordinate CMPs are often produced by the Design Authority for a specific system or sub-systems.

3.3.1.5 CM Responsibilities

1. Many organizations and individuals may be involved in one aspect or another of CM for an aeronautical product type. Therefore, it is essential that a CCA be identified for the aeronautical product approved type design and CM responsibilities be assigned to the appropriate organizations and individuals. Their participation in the CM process will depend on the extent to which they raise CM-related activities such as proposing design changes, deviations and waivers.

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SECTION 2

RULES AND STANDARDS

3.3.2.R1 Configuration Management Requirements

1. In accordance with 3.3.2.S1, all aeronautical products for which a DND type certificate has been issued shall be subject to a formal configuration management system which is documented in an approved in-service configuration management plan acceptable to the TAA.

3.3.2.S1 Configuration Management Requirements

1. All DND aeronautical products for which Type Certification is required shall have an in-service CMP. The in-service CMP shall be approved by the Configuration Control Authority for the approved type design, and submitted to the TAA for review prior to the submission of a request to the TAA for TAC in accordance with 2.3.2.R1.

2. The in-service CMP shall be developed, approved, implemented and maintained to address the following CM requirements:

a. **Configuration Identification** - identify and document the functional and physical characteristics of configuration items (CI);

b. **Configuration Control** - control changes to CIs and their documentation;

c. **Configuration Status Accounting** - record and report the information needed to manage CIs effectively, including the status of proposed changes and the implementation status of approved changes; and

d. **Configuration Audit** - check CIs for compliance with their configuration identification.

ADVISORY NOTES

1. *Regardless of the age or complexity of the aeronautical product that is under CM, all CM requirements must be performed to some extent.*

2. *Section 3 of this Chapter provides guidance on sharing of CM responsibilities.*

3. The in-service CMP shall document a CM system based on a standard acceptable to the TAA. Acceptable standards include:

a. NDHQ Policy Directive P1/91 Configuration Management Policy for Defence Systems;

b. MIL-HDBK-61A Configuration Management Guidance;

c. ISO 10007 Quality Management, Guidelines for Configuration Management;

d. ANSI/EIA 649 National Consensus Standard for Configuration Management; and

e. Other standards demonstrated to be equivalent.

ADVISORY NOTES

1. *CMPs shall be prepared in accordance with D-01-002-007/SG-001 by DND/CAF units. Otherwise, the actual format or layout of the CMP is left to the discretion of the organization(s) involved, provided the topics in the equivalent standards are adequately addressed. Section 3 of this Chapter also provides an example of a table of contents typically used for a CMP.*

2. *ANSI/EIA 632 Processes for Engineering a System and ANSI/EIA 836 Configuration Management Data Exchange and Interoperability could be used to complement ANSI/EIA 649.*

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SECTION 3

ADVISORY MATERIAL

NOTE

In an effort to provide Advisory Material to TAM users as rapidly as possible, all applicable Advisory Material will be published in the form of TAA Advisories, and will be posted on the DTAES websites, which are updated regularly. The Advisory Material presented in this section will eventually be converted into a TAA Advisory.

3.3.3.1 CM Responsibilities

1. **Configuration Control Authority (CCA).** The responsibility of CCA for an approved type design is assigned to an individual prior to the release to operational service of the aeronautical product, to satisfy the continuing airworthiness CM requirements. The CCA resides within the Type Certificate Holder (TCH) organization. This individual is normally the person responsible for the airworthiness-related activities within a TAA-Acceptable Organization, in accordance with Part 1, Chapter 4, and is also called the WSM/AEO or SDE. In some cases, the CCA could be the program manager.

2. The CCA controls the introduction of design changes into the aeronautical product type design and configuration changes into the in-service aeronautical products. The CCA determines the extent of involvement and the integration of all support organizations for both the approved type design and the in-service products into the CM process. In particular, CM responsibilities include:

a. approve and issue of the in-service Configuration Management Plan (CMP) for the aeronautical product type;

b. sponsor and approve all related subordinate CMP for required support organizations;

c. establish, document and track the configuration baseline or approved configuration(s) as defined by the TAA- approved type design;

d. analyze and track all proposed design changes to the approved type design and proposed configuration changes to the approved configuration(s), from an airworthiness and configuration management perspective;

e. plan and monitor the incorporation of approved design changes into the approved type design and approved configuration changes into the aeronautical products;

f. maintain all configuration management related documentation; and

g. record and track all deviations and waivers approved in accordance with Part 5, Chapter 9.

3. For the day-to-day operation of the CM program, the CCA may assign some airworthiness-related CM responsibilities to other personnel within the TAA-Acceptable Organization, in accordance with Part 1, Chapter 4. These personnel are often given the titles of Configuration Managers and CM specialists. Nevertheless, it is the responsibility of the CCA to ensure that CM tasks are properly conducted.

4. **Other CM Organizations.** For management or business reasons, CM responsibility for an entire system or component such as an engine or radar could be assigned to an organization other than the TAA-Acceptable Organization who manages the aeronautical product. This enables the assigned organization to manage the item in totality. This organization would normally be part of the formal DSN or other support arrangements established for the aeronautical product type, and CM responsibility would be assigned to individuals in this organization. The CCA for the aeronautical product type design would require to be involved only when a proposed design change will impact the aeronautical product approved type design or configuration(s).

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5. The designated CCA does not require direct involvement in all CM activities for every sub-system within the aeronautical product type, but shall ensure that the relationship and responsibilities of all involved organizations are well defined and documented. The criteria and the procedures to be followed to record and track a proposed design change to a sub-system, component or equipment to the CCA must be specified. These criteria should be based on functionality and interfaces and, therefore, must refer to the requirements' documentation. Although not airworthiness-related, the criteria should also be based on resource utilization and cost.

6. **Configuration Control Board (CCB).** For complex aeronautical products, such as an aircraft with several organizations involved in the CM of systems, sub-systems, components and equipment, it is advisable to employ a formal CCB, chaired by the CCA for the aircraft approved type design. The creation of a CCB involves defining the terms of reference, establishing standard operating procedures, including frequency of meetings and processing of urgent changes, and detailing the process for delegations to subordinate boards and individuals, including the limitations of their authority. A CCB is a normal part of the design development of an aeronautical product. The functions of a CCB during in-service and disposal of an aeronautical product may be met by means other than a formal CCB and would be detailed in the CMP.

3.3.3.2 Example of Table of Contents Used for CMP

1. An effective CMP typically consists of the following topics:

   a. **Introduction**

      (1) Purpose

      (2) Scope

      (3) Applicability

      (4) Description of the configuration item(s)

      (5) Special features (facilities, location, flight simulators, etc.)

      (6) CM policy directive

      (7) Reference documents

      (8) Definitions

      (9) Acronyms and abbreviations

   b. **Organization**

      (1) CM structure/interrelationships

      (2) CM organization

      (3) CM responsibilities

      (4) Configuration control board

   c. **CM Implementation**

      (1) CM Implementation phase(s)

      (2) CM Transition Plan

      (3) Milestones

   d. **Configuration Identification**

      (1) Configuration item(s)/nomenclature

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(2) Hardware/firmware/software identification

(3) Configuration documentation

(4) Documentation numbering

(5) Drawing numbers

(6) Part numbers

(7) Serial numbers

(8) Marking

(9) Configuration baselines (functional, allocated, product)

e. **Configuration Control**

(1) Change process

(2) Change documentation

(3) Change classification

(4) Change approval/disapproval/Configuration Control Board

(5) Change release/implementation

(6) Deviations and waivers

f. **Configuration Status Accounting**

(1) CM System/databases

(2) CM recording

(3) Baseline(s) identification and tracking

(4) CM reporting

g. **Configuration Audits and Technical Reviews**

(1) Functional configuration audits

(2) Physical configuration audits

(3) Technical reviews

(4) CM Internal audits

(5) Quality assurance requirements

h. **Interface Management**

(1) Interface documentation

(2) Interface control

i. **Sub-contractor/Vendor Control**

(1) CM requirements

(2) Vendor change control

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PART 3
CONTINUING AIRWORTHINESS

CHAPTER 4 - IN-SERVICE MONITORING PROGRAM

SECTION 1

INTRODUCTION

3.4.1.1 Purpose

1. The purpose of this chapter is to provide the rules, standards and advisory material associated with the In-service Monitoring Program (ISMP).

3.4.1.2 Overview

1. **General.** An aeronautical product is considered airworthy when it is designed in compliance with the applicable airworthiness standards listed in the approved Certification Basis and is manufactured in conformance with its approved type design. The acceptable level of aviation safety established during the design certification is maintained throughout the product's in-service usage when it is:

   a. operated in accordance with the approved design operating limitations;

   b. maintained in accordance with the approved maintenance program; and

   c. modified in accordance with an approved design change process.

2. **In-service Degradations.** The actions and/or decisions taken during the airworthiness-related activities conducted throughout the service life of an aeronautical product can compromise the level of safety or state of airworthiness of an approved type design. Degradations of airworthiness or general level of safety may be either product or design related degradations.

3. **Product Safety Degradations.** Product-related safety degradations generally are the result of actions taken and/or decisions made during the in-service engineering support, maintenance, material support, or operation of aeronautical products. Product safety degradations include:

   a. Degradation or deterioration as a result of a change in the operational role during the in-service phase which was not considered during the initial development of the type design of an aeronautical product;

   b. In-service wear beyond the allowable design limits or structural damage (such as cracking) which is not detected and/or corrected in sufficient time by the approved maintenance program for the aeronautical product;

   c. Unforeseen environmentally induced deterioration;

   d. Improper or inadequate maintenance conducted on an aeronautical product either through error or intentionally such as the use of non-standard repair schemes or procedures; and

   e. Installation of unapproved parts in an aeronautical product including non-conforming, counterfeit, incorrectly repaired parts, or incorrect substitutions.

4. **Design Safety Degradations.** Design-related safety degradations occur as a result of engineering decisions taken either during the initial development of the design or during in-service engineering support. Design safety degradations include:

   a. selection of inappropriate airworthiness design standards for use in the development and demonstration of compliance for a type design or for a subsequent design change;

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b. design shortcomings or deficiencies, which are undetected during either the initial development of the type design or for a subsequent design change;

c. invalid assumptions made during the development process or the subsequent analysis or testing of the type design;

d. incorporation of an unapproved design change into the approved type design for an aeronautical product; and

e. making engineering decisions regarding the approved type design of an aeronautical product without considering the effect on airworthiness.

3.4.1.3 Aeronautical Product In-service Monitoring Program (ISMP)

1. **ISMP Activities.** Information and data needs to be collected, collated and analyzed as necessary to ensure appropriate corrective action is taken to rectify potential problems and deficiencies before the situation deteriorates to an unacceptable level of safety. The aeronautical product ISMP shall address, at a minimum, the following monitoring activities:

a. Airworthiness Directives;

b. OEM service information;

c. Flight safety occurrence and aircraft accident;

d. Reliability and maintainability;

e. Aircraft Usage and Condition Monitoring;

f. Other operator experience;

g. Airworthiness risk; and

h. Non-conforming parts.

2. **Annual Airworthiness Report - Technical (AAR - Tech).** The major product and design degradations identified by the ISMP will be reported in the AAR - Tech. The format, content, and instructions for the preparation of the AAR - Tech are detailed in Section 2 of this chapter. The AAR - Tech encompasses more reporting requirements than the ISMP, however the AAR - Tech format allows for the reporting of any monitoring activities.

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SECTION 2

RULES AND STANDARDS

3.4.2.R1 Aeronautical Product In-service Monitoring Program (ISMP)

1. The Type Certificate Holder (TCH) for the approved type design of an aeronautical product shall establish an Aeronautical Product In-service Monitoring Program (ISMP) acceptable to the TAA as described in 3.4.2.S1.

3.4.2.S1 Aeronautical Product In-service Monitoring Program (ISMP)

1. The Aeronautical Product ISMP shall encompass the following airworthiness monitoring activities:

   a. **Airworthiness Directives.** The TCH shall have a process for the monitoring of Airworthiness Directives issued in accordance with Part 5, Chapter 6.

   b. **OEM Service Information.** The TCH shall have a process for the monitoring and assessment of all OEM-issued service information. This information may be issued in the form of Alert Bulletins, Service Bulletins, Service Information Letters, Engineering Orders, maintenance program changes, or other documents.

   c. **Flight Safety Occurrences and Aircraft Accident Reports.** The TCH shall have processes to ensure that flight safety occurrences and aircraft accident reports are assessed for product and/or design safety degradations. This shall include the monitoring of air and ground incidents and accidents reported through the DND Flight Safety Program and accident reports published by foreign military safety programs or other regulatory organizations such as the Transportation Safety Board of Canada or the National Transportation Safety Board (United States).

ADVISORY NOTES

1. *The DND/CAF Flight Safety Program requires military flight safety-related occurrences including air/ground incidents and accidents to be reported in accordance with A-GA-135- 001/ AA-001* - Flight Safety for the Canadian Forces.

2. *Reports of flight safety occurrences are an excellent indicator of potential problem areas in the in-service operation and usage of aeronautical products. Occurrence information with the assigned cause factors may highlight potential product degradations or design deficiencies. Further, investigation reports generated by foreign military or other regulatory organizations may provide significant information in assuring an acceptable level of safety is maintained during the in-service operation of an aeronautical product.*

3. *During accident investigations, the TCH may need to take preliminary action prior to the final accident report being released.*

   d. **Reliability and Maintainability.** The TCH shall have a process to conduct reliability and maintainability analysis during the in-service operation of an aeronautical product.

ADVISORY NOTE

The TCH is required to provide a system for continuing reliability and maintainability analysis. The business incentive for reliability and maintainability monitoring is that aircraft equipment that is failing prematurely can have a significant economic cost over the life cycle of an aircraft. From an airworthiness perspective, the increasing failure of installed aircraft equipment may indicate a degrading level of safety for an aeronautical product. As a result, failure data should be collected, collated and analyzed to ensure the in-service failure modes and rates do not expose an aeronautical product to hazardous conditions.

   e. **Aircraft Usage and Condition Monitoring.** The TCH shall have a process for monitoring the condition of the Aircraft Structure, Mechanical Systems, Propulsion Systems and Aircraft Electrical Wiring

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Interconnection Systems. The full requirements for these monitoring programs are specified in the respective annexes to this chapter, as follows.

(1) Annex A - Aircraft Structural Integrity Monitoring Requirements;

(2) Annex B - Aircraft Mechanical Systems Integrity Monitoring Requirements;

(3) Annex C - Engine Structural Integrity Monitoring Requirements; and

(4) Annex D - Aircraft Electrical Wiring Interconnection System (EWIS) Integrity Monitoring Requirements.

ADVISORY NOTE

Comparable programs developed by OEMs, civil operators or foreign armed services could fulfill the requirements of the Aging Aircraft Assessment. Acceptance of other programs, as suitable to meet the Aging Aircraft requirements, will require consultation with appropriate SMEs. This evidence may then be used by the TCH to propose a comparable program that meets the necessary requirements.

f. **Other Operators' Experience.** The TCH must have a process to ensure that other operators' experience associated with the product or design degradations of an aeronautical product are assessed for applicability;

ADVISORY NOTE

Other aircraft operators/maintainers operating similar aeronautical products can provide an important source of information on potential in-service problems including the associated corrective action. This information can provide the TCH with advance notification of in-service problems and provide useful information on proactive actions alleviating degradation in the level of safety of an aeronautical product. The TCH should ensure that appropriate information exchange processes are in place to ensure that other operators' information is available for review and investigation. The TCH monitoring program for this monitoring activity should include at a minimum which operators/maintainers are part of the information exchange, what information is exchanged, how the information is analyzed and how the results of the analysis are reported and to whom.

g. **Airworthiness Risk.** The TCH shall have a process for the monitoring and tracking of airworthiness risk as described in Part 5, Chapter 1; and

h. **Non-conforming Parts.** The TCH shall have a process for the monitoring and reporting to the TAA of all non-conforming parts that have been received for use on an aeronautical product.

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ADVISORY NOTES

1. *Within the category of unapproved parts, replacement parts may be determined to be non-conforming parts. Non-conforming parts are unapproved parts that can not be certified as approved parts and include:*

   a. *fraudulent or rejected manufactured parts;*

   b. *parts removed from service that exceed approved wear/damage limits, with no repair potential;*

   c. *time expired shelf-lifed parts;*

   d. *parts subjected to unacceptable modification or rework that is irreversible;*

   e. *parts that have been exposed to extreme forces or heat and cannot be restored by means of approved procedures;*

   f. *life-limited parts (parts that, as a condition of the Type Certificate of an aeronautical product, may not exceed a specified time or number of operating cycles in service), which have consumed all of their approved service life or have missing or incomplete records; and*

   g. *parts that have failed the recertification process as per 3.1.2.R13.*

2. *The non-conforming parts monitoring system is required to allow the sharing of "bogus" part information with other regulators and Acceptable Technical Organizations. Transport Canada and the FAA require that civil organizations voluntarily participate in a system called "Suspected Unapproved Parts" reportinThis system meets the requirements of this chapter.*

3. *For organizations that meet the requirements of A-GA-135-001/AA-001* - Flight Safety for the Canadian Forces, *the DND/CAF Flight Safety Information System (FSIS)reporting database has an option to report non-conforming parts. Parts determined to be nonconforming through normal use within DND do not require reporting in this system since they will be disposed of in accordance with Part 4, Chapter 1. Parts that are received from a supply source for use on a DND aircraft that are determined to be non-conforming trigger the requirements of this chapter. For CAF technicians, C-05-005-P09/AM-001 requires that the TCH be notified if a part identified as being non-conforming is received and also be reported in accordance with the DND Flight Safety Program. These reporting procedures, when followed, are compliant with the requirements of this chapter for non- conforming parts monitoring.*

2. The ISMP shall ensure that appropriate corrective action is taken when the monitoring activities specified in 3.4.2.S1.1 identify possible degradations in the level of safety.

ADVISORY NOTE

Possible corrective actions for any identified level of safety degradation are:

a. *Adjustments to usage or role;*

b. *Design change or product improvement; and*

c. *Maintenance program amendments.*

3. The risk management requirements of Part 5, Chapter 1 shall be initiated when corrective action cannot be implemented as required by 3.4.2.S1.2, in a manner that would result in an acceptable level of safety for the aeronautical product.

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ADVISORY NOTE

There may be occasions where risk management is required in conjunction with an identified corrective action. This is generally the case when the corrective action cannot be implemented in a timely manner (for example, design change) and the aeronautical product is to be operated at a level of safety that would not normally be considered acceptable.

3.4.2.R2 In-service Monitoring Program (ISMP) Reporting

1. The outcome of the ISMP shall be reported to the TAA in the Annual Airworthiness Report - Technical (AAR - Tech) as detailed at 3.4.2.S2.

3.4.2.S2 In-service Monitoring Program (ISMP) Reporting

1. **Annual Airworthiness Report - Technical (AAR - Tech).** The TCH shall report the outcome of the ISMP in the AAR - Tech. The AAR - Tech submitted to the TAA shall describe:

   a. Monitoring activities resulting in the implementation of corrective actions; and

   b. Investigation of in-service problems that were considered to affect the level of aviation safety.

ADVISORY NOTES

1. *The format and content of the AAR - Tech allows for the reporting of any of the in-service monitoring activities detailed at 3.4.2.S1.*

2. *An AAR – Tech procedure approved by the TAA is provided in the Director-General Aerospace Equipment Program Management (DGAEPM) AF9000 Plus Manual of Aerospace Procedures (MAP) (TAA01.003 – Airworthiness Review Board). Each TCH organization must prepare and staff an AAR – Tech in accordance with the format described in this procedure.*

2. **TAA Requested Report.** The TAA may request at any time and as deemed necessary a report from the TCH on specific in-service problems.

ADVISORY NOTES

1. *A report may be requested by the TAA on occasions when the TAA is aware of an in- service problem for an aeronautical product that may potentially reduce the level of safety of an aeronautical product.*

2. *A report may be requested by the TAA on occasions if the TCH is not complying with a relevant mandatory service document.*

3. *A report may be requested by the TAA on aircraft accidents, as detailed at 3.4.2.S1.1.c.*

4. *The format of this report is not stipulated but the report content should include the purpose of the report, the identification of the aeronautical product, background information related to the problem (if a problem originates from another operator, the report should also include the other operator's corrective actions taken), risk assessment, if done, corrective actions intended (that is short and/or long term) and status of these corrective actions, as well as the frequency of future reporting to the TAA.*

3. **TCH Reporting on Specific In-service Problems.** The TCH shall report at anytime to the TAA on in- service problems affecting the aviation safety of an aeronautical product to demonstrate that timely corrective actions are being implemented.

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ADVISORY NOTES

1. *A report should be provided to the TAA when a monitoring activity results in a risk index of high and above, or when a non-conforming part is discovered, or at the discretion of the TCH.*
2. *The report content should be in the format specified in 3.4.2.S2.2, Advisory Note 4.*
3. *The TCH has a responsibility to ensure that other users, appropriate regulatory agencies, OEM, etc. of similar aeronautical products are made aware of any airworthiness issues that have been encountered and/or resolved.*

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ANNEX A

AIRCRAFT STRUCTURAL INTEGRITY MONITORING REQUIREMENTS

1. This Annex supplements Section 2 of this Chapter. It amplifies the requirements of the aircraft structural integrity monitoring activities.

2. **SOI or Baseline Usage.**

   a. Every aircraft type shall have a valid and up-to-date SOI or Baseline Usage documented; and

   b. The SOI or Baseline Usage shall contain enough details to enable structural life assessment when compared to actual usage.

3. **Structural Usage Monitoring.**

   a. A structural usage monitoring program shall be implemented for every aircraft type on the DND register that includes, but is not limited to, the following components.

      (1) A fatigue monitoring program on each individual aircraft capturing enough data to permit continual structural life consumption evaluation of lifed items.

ADVISORY NOTES

1. *The U.S. Air Force Aircraft Structural Integrity Program (ASIP) defined in MIL-HDBK-1530, more specifically those defined in Tasks IV and V, is an acceptable method of compliance with the requirements of aircraft structural usage monitoring. The TAA staff should be consulted if this method of compliance is intended.*

2. *The structural usage monitoring process may collect a broad spectrum of parameters and data type, using data gathering methods ranging from a paper- based system collecting flight hours and mission type to complex digital onboard monitoring systems collecting flight parameters and possibly strain gauge data. An increase in the level of sophistication of the data gathering system usually results in a decrease in the level of conservatism required during structural integrity activities. The data type and the complexity of the data gathering process will be predicated on, but not limited to, the following:*

   a. *the usage (more specifically, the mission, roles and tasks) as compared to original design usage;*

   b. *the aircraft type (e.g., fighter, trainer, transport, etc.);*

   c. *the variation of usage and number of roles within the fleet;*

   d. *the importance of fleet both in terms of aircraft number and operational priority;*

   e. *the cost of monitoring and access to a structure support contractor or a DND/CAF support unit capable of processing the collected data; and*

   f. *the age of fleet, years remaining to estimated life expectancy and probability of extension to the estimated life expectancy.*

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3. *Structural usage monitoring may not be required for fleets where all of the following can be clearly demonstrated, as approved by the TAA and documented in the Aircraft Structural Integrity Management Plan (ASIMP):*

   a. *that missions, roles and tasks are well defined, stable and within the limitations defined in the SOI;*

   b. *that there is a remote possibility for an undetected increase in usage/environmental usage severity within the limitations of the well defined and stable mission/roles and tasks; and*

   c. *that current fatigue/environmental usage severity is equal or less than that utilised by the aircraft manufacturer during design.*

4. *Although resource intensive, structural usage monitoring provides a wealth of information that may prove to be invaluable during a number of aircraft life cycle activities, and more importantly during one of the following:*

   a. *major as well as major and extensive design changes where structural airworthiness standards would be substantiated against actual usage as opposed to original design usage that may be questioned and possibly challenged by the TAA;*

   b. *estimated life expectancy extension where structural usage monitoring would provide how much structural life has been consumed and, using current usage data, could predict how much structural life would remain when the new estimated life expectancy is reached; and*

   c. *when new or modified missions, roles and tasks are introduced for the fleet, or when it is discovered that actual usage is more severe then originally anticipated at design. Structural usage monitoring can help in reducing conservatism when structural lives are re-assessed.*

(2) A review process to compare collected fatigue data against the baseline usage on which the design and maintenance is predicated to capture increases in usage severity or detrimental trends.

ADVISORY NOTE

Comparison should be performed against original design, as documented in the SOI, for newer fleets and for fleets where unique usage trends have not developed. If unique trends have developed to the point where structural lives (including the effect of environment, when applicable) have been determined on this unique usage and that the maintenance program has been modified to accommodate this usage, then, comparison should be performed against the latter.

(3) A process to re-evaluate component lives and/or critical locations when significant changes in usage severity is detected.

(4) Changes in fatigue life or critical locations resulting from divergences in usage severity shall be reflected in the maintenance program.

4. **Structural Condition Monitoring.**

a. There shall be a program implemented to monitor structural repairs and inspection records. The program shall apply at least to primary structure (and dynamic components for helicopters).

b. The structural condition monitoring program shall include long-term impact assessment of structural repairs at or near critical locations and other repairs.

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ADVISORY NOTES

1. *Many repairs and modifications will be incorporated on an aircraft during its lifetime. Some of these repairs or modification may be in close vicinity to each other or critical locations. In addition, the location of the repairs will vary between aircraft. When incorporating repairs on an aircraft, attention should be paid to long term impact of such engineering concerns as loads redistribution and stress concentrations due to the interaction with existing adjacent repairs, modifications and critical locations.*

2. *Depot level inspection programs provide an opportunity to assess the impact of adjacent repairs and modifications on an individual aircraft basis. When practical the interaction of adjacent repairs and modifications should be assessed/reassessed for each individual aircraft during its major depot level inspection activities.*

c. The structural condition monitoring program shall include review of inspection records to determine trends in the frequency of fatigue damage in specific locations.

d. The structural condition monitoring program shall include review of service difficulty reports (or equivalent) to detect any difficulty that could impact the long term aircraft structural integrity.

e. A process shall be implemented to re-evaluate the maintenance program (including corrosion prevention and control procedures) as a result of detrimental trends identified through structural condition monitoring.

5. **Aging Aircraft Structural Assessment (AASA).**

a. The requirement to conduct an AASA will be reflected in the Aircraft Structural Integrity Management Plan (ASIMP) in accordance with the requirements of 3.4.2.S1.1.e.

b. The AASA shall be carried out no later than 15 years after the production of the first aircraft delivered to the RCAF and at regular intervals thereafter. Fleets that result from the procurement of previously used aircraft shall use the earliest production date of all the aircraft transferred to the RCAF to determine whether or not the fleet has passed its 15th year.

c. The AASA is a review involving:

(1) a review of all structural records;

(a) structural design criteria (i.e., Safe Life, Damage Tolerance, Fail Safe, etc.);

(b) currency, completeness and accuracy of static and fatigue qualification documentation;

(c) the relevance, currency and results of in-service structural monitoring, including inspection methods, and individual aircraft tracking programs, including any fatigue management decisions made since the commencement of service use;

(d) current aircraft status (i.e., years in service, total flight hours, fatigue consumption, date of last inspection, status of life-limited parts, applicable ADs and SBs);

(e) the structural configuration management process, including the adequacy of original repair assessments particularly in relation to the effects of environmental degradation, changes in aircraft usage severity, repair proximity and repair interaction on inspection requirements and repair lifing;

(f) effectiveness of the Configuration Control Database in providing accurate details on the locations and categorizations of all structural repairs and modifications; and

(g) details of the existing corrosion protection and control program.

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(2) a physical examination of the airframe to assess the overall condition of the structure with particular emphasis on unexpected defects, corrosion or any other deterioration that can be identified. The location and proximity of all structural modifications or repairs must be assessed and compared against the configuration management database. Any identified degradations are to be assessed and documented;

(3) an assessment of additional inspections required to safely achieve the Estimated Life Expectancy (ELE) of the fleet. These additional inspection requirements are based upon the initial inspection program supplemented by in-service history and damage tolerance assessments, whenever possible;

ADVISORY NOTE

Additional inspections may need to be developed, depending upon the state of the Structural Integrity program in place for the fleet and the overall state of the structure identified during the physical examination. There may be situations whereby no additional inspections over and above those already planned would be required.

(4) an evaluation of the existing Corrosion Prevention and Control Program (CPCP) based upon the results of the physical inspection of the aircraft; and

(5) an assessment of the susceptibility of the structure to Widespread Fatigue Damage (WFD), as demonstrated by fatigue testing, in-service evidence and/or analytical methods.

ADVISORY NOTE

The FAA defines WFD as follows: "WFD, in a structure, is characterized by the simultaneous presence of cracks at multiple structural details that are of sufficient size and density whereby the structure will no longer meet its damage tolerance requirement (i.e., to maintain its required residual strength after partial structural failure)." (Reference: FAA AC 25.571-1C).

6. **Aircraft Structural Integrity Management Plan (ASIMP).** There shall be a valid and up-to-date ASIMP, or equivalent plan maintained for the fleet. The ASIMP shall contain:

a. the following basic information:

(1) **Aircraft Information.** This part of the ASIMP provides general information on the aircraft structure, to put the in-service part of the ASIMP in context. This part will include the following information:

(a) **Aircraft Description.** Provision of a general aircraft description, including main operating features, roles, physical and operating characteristics, mass and center of gravity information, design service life and a list of design changes that were required to accommodate the configuration.

(b) **Acquisition Details.** This section will provide the high-level details on the contractual arrangement under which the fleet was procured, the delivery schedule, the contractor support arrangements and timeframe for such support.

(c) **Type Certification Information.** This section will provide a high-level description of:

i. the structural airworthiness standards of the aircraft on which the aircraft is based;

ii. the structural design standards used for the DND Certification Basis;

iii. the structural design criteria (safe life, damage tolerance, fail safe) and the maintenance actions related to the selected criteria; and

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iv. a list and description of the major activities, related to the demonstration of compliance of the structure with the applicable airworthiness standards that were performed during the initial and DND certification programs. Examples of activities are full-scale tests (static, durability, and damage tolerance), component tests, coupon tests, new material tests, environmental tests, static analyses, durability analyses and damage tolerance analyses.

(2) **Description of the Structure.** This section will provide both pictorial and written description of the aircraft major structural elements, how they interact and how the load is carried by the structure.

b. the following aircraft fleet structural integrity management information:

(1) description, supported by a figure, of all the aircraft Structurally Significant Items (SSI) or Primary Structural Elements (PSE), including material type and heat treatment. It shall furthermore, provide a list, supported by figures, of the critical structural locations or features that will require special attention or regular inspections;

(2) description of the assigned responsibilities for aircraft structural integrity monitoring activities;

(3) information on the structural usage monitoring data being collected, the parameters being collected, sampling frequency, the data collection and transfer process and the related DND units and contractor responsibilities;

(4) description of the processing being performed on the structural usage data and how the data is being used for aircraft airworthiness and fleet management;

(5) description of the data review process and frequency and how the results of the above processes are inserted back into the maintenance program activities and schedule;

(6) usage statistics for both design (or unique usage, if applicable) usage and current usage in enough detail to assess usage severity one against the other. The information is to be broken down by tail number, units (e.g., squadron), geographical divisions (e.g., East and West coast) as applicable, and for the fleet. Projection of current statistics is to be presented up to estimated life expectancy;

(7) description of the structural condition monitoring data being collated, reviewed and documented and how the results of this process are being used to affect the maintenance program activities and schedule;

(8) description of projects and special activities being planned or currently on going related to the aircraft structure such as sampling inspection, follow-on full-scale/component structural test, coupon testing program, etc.;

(9) discussion of any structural issues (such as modifications, fatigue, repairs, environmental degradation) that require attention or are to be monitored for the upcoming reporting period; and

(10) when applicable, by reference to the individual AASA reports, a synopsis of the AASA results and associated follow-on aging aircraft specific activities that will be required to maintain the aging aircraft structural integrity until ELE.

7. **Corrective Action.** Where the aircraft structural integrity monitoring activities have identified a possible reduction in the level of aircraft safety, corrective action shall be taken in accordance with the requirements of 3.4.2.S1.2.

8. **Reporting.** The ASIMP shall be reviewed at least every two (2) years, with the end of the review cycle scheduled such that the review data and results are available for presentation to the Airworthiness Review Board (ARB) for that particular year.

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9. **Approval.** The ASIMP must be approved by the TAA for the initial approval and subsequent significant changes.

ADVISORY NOTE

Significany changes to an ASIMP include, but are not limited to, the following:

a. *Lifing policy update;*

b. *Change in the usage tracking method (new analysis method, new instrumentation, changes from safe life to damage tolerant, etc.);*

c. *Overall aircraft life extension or ELE change;*

d. *Change of ASIMP contractor; and*

e. *Reduction in ASIP activities due to impending retirement.*

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ANNEX B

AIRCRAFT MECHANICAL SYSTEMS INTEGRITY MONITORING REQUIREMENTS

1. This Annex supplements Section 2 of this chapter. It amplifies the requirements of the aircraft Mechanical Systems Integrity Monitoring activities.

2. **Mechanical Systems Identification.** As used in this annex, the following are considered Mechanical Systems:

   a. Fuel, including fuel tanks, pumps, lines, etc.;

   b. Hydraulic, including reservoirs, pumps, lines, etc.;

   c. Oxygen, including reservoirs, pumps, lines, regulators, etc.;

   d. Environmental control;

   e. Flight Controls, including pulleys, cables, rods, attachment points, etc.;

   f. Propellers and rotor blades;

   g. Pitot-static;

   h. Undercarriage/landing gear mechanism (non-structural aspect);

   i. Wheels, tires & brakes;

   j. Pneumatic (bleed air, anti or de-icing, pressurization, etc.);

   k. Fire protection, fire walls, detection/extinguishing, lines, etc.;

   l. Transmission/drive components;

   m. Aircraft interior, seats, ejection seats and restraints; and

   n. Aircraft stores suspension equipment (Pylons, Racks, launchers, non-releasable stores, etc.).

ADVISORY NOTES

This Annex does not apply to systems that are covered under other regulatory or safety program requirements. This includes:

a. ***Ammunition and expendable explosives stores****, which are addressed by the procedures detailed in D-09-002-010/SG-000* - Standard Assessment of Safety and Suitability for Service for Ammunition and Explosives*. The determination of in-service monitoring requirements use the principles detailed in D-09-002-017/SG-001* - Standard In-Service Surveillance of Ammunition and Explosives*; and*

b. ***Non-ammunition expendable aircraft stores****, such as sonobuoys, are considered consumable items with an approved service life that is not normally changed.*

3. **Mechanical Systems Monitoring Program.** A Mechanical Systems Monitoring Program shall be implemented for every aircraft type on the DND register. This program will include, without being limited to, the following components:

   a. Evaluation of the inspection schedule, to ensure that the Mechanical System inspection program has sufficient coverage of the potential hazards caused by system failures. This evaluation should ensure:

      (1) the inspection schedule covers all critical mechanical systems;

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(2) appropriate inspection tasks exist for all mechanical systems, where a system failure will cause a significant hazard to the aircraft resulting from:

(a) loss of system function; or

(b) secondary damage that may have a direct adverse effect on safety.

ADVISORY NOTE

Secondary damage considerations include a failure that could result in: fire, loss of primary or utility hydraulic systems, loss of pressurization, damage to mechanical or electronic flight controls, or loss of an adjacent critical mechanical system.

(3) implementation of mechanical system maintenance best practices that include proper separation between hydraulic, fuel and oxygen lines and detection of chaffing, fretting and leaks.

(4) appropriate instructions for protections and caution information that will minimize contamination and accidental damage to mechanical systems, as applicable, during performance of maintenance, alteration, or repairs.

b. Data collection of in-service difficulties, and corrective actions;

c. Review and evaluation of in-service data; and

d. Data reporting to present the information.

4. **Corrective Action.** Where mechanical systems monitoring activities have identified a possible reduction in the level of aircraft safety, corrective action shall be taken in accordance with the requirements of 3.4.2.S1.2. Additional considerations for corrective action shall include:

a. changes to maintenance schedule task frequency or task instructions; and

b. changes to corrective maintenance instructions to enhance coverage of protection and caution information that will eliminate identified hazards and minimize accidental damage to mechanical systems during performance of maintenance or repairs.

5. **Reporting.** The Mechanical Systems Monitoring Program shall be reviewed at least every two (2) years, with the end of the review schedule such that the review data and results are available for presentation to the Airworthiness Review Board (ARB) for that particular year. Reporting will include results of data collected as per items listed in paragraph 3 and paragraph 4., above.

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ANNEX C

ENGINE STRUCTURAL INTEGRITY MONITORING REQUIREMENTS

1. This Annex supplements Section 2 of this chapter. It identifies the requirements of engine structural integrity monitoring activities.

2. **Basic Requirements.** Each fleet shall establish and document an Engine Structural Integrity Program (ESIP) that meets all requirements herein, with a designate Office of Primary Interest (OPI). ESIP requirements for a specific fleet can be met by developing an Engine Structural Integrity Management Plan (ESIMP) from the requirements specified herein, or by confirming through documentation that other programs already in existence with a specific engine fleet meet all requirements of ESIP. Each engine fleet shall have:

a. a defined program to, at regular intervals:

(1) re-assess and document actual usage conditions,

(2) compare actual usage conditions against design usage conditions, and

(3) determine life consumption based on actual usage (of critical components, as a minimum) accordingly;

b. documentation providing:

(1) a valid and up-to-date listing of all critical engine components,

(2) defined maintenance, inspection and usage monitoring requirements, as applicable, and

(3) defined service life for all critical engine components reflecting actual usage conditions; and

c. a published Engine Structural Integrity Management Plan (ESIMP) that would satisfy these basic requirements.

3. **Engine Structural Integrity Management Plan (ESIMP).** ESIP requirements for a specific fleet can be met by developing an ESIMP from the requirements specified herein, or by confirming through documentation that other programs already in existence with a specific engine fleet meet all requirements of ESIP.

a. The ESIMP shall contain or refer to documentation containing the following engine information:

(1) **Engine Description.** This section will provide a general engine description, including:

(a) main operating features, variants, physical and operating characteristics, design service life and a list of design changes that were required to accommodate the configuration; and

(b) pictorial and written description of the engine structure and the critical components or refer to documents containing this information.

(2) **Acquisition Details.** This section will provide the high level details on the contractual arrangement under which the engine fleet was procured, the contractor support arrangements and timeframe for such support.

(3) **Type Certification Information.** This section will provide a high-level description of:

(a) the certification basis/airworthiness standards of the design on which the engine is based and/or used for the DND Certification Basis;

(b) the critical engine components design criteria (safe life, damage tolerance, fail safe) and the maintenance actions related to the selected criteria; and

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(c) the documentation of the engine model specification and confirmation that the engine satisfies the model specification.

b. The ESIMP shall contain the following fleet integrity management information or refer to documentation accessible to DND that contains the following fleet management information:

(1) Description, supported by a figure, of all engine critical components including material type, heat treatment and coatings where not limited by IP constraints;

(2) Maintenance, inspection and usage monitoring requirements, as applicable, either directly or by reference to the required technical documentation. Responsibilities for engine usage monitoring activities should be clearly assigned: identification of all required engine usage parameters, the means to collect them, sampling frequency, the data collection and transfer process and the related DND units and contractor responsibilities;

(3) Description of the engine usage parameters being collated, reviewed and documented and how the results of this process are being used to affect the maintenance program activities and schedule;

(4) Description of the processing being performed on the critical component usage data and how the data is being used for engine airworthiness and fleet management;

(5) Description of the data validation and review process, including frequency, and the means by which the results of the above processes are inserted back into the maintenance program activities and schedule;

(6) Usage statistics for both design usage and actual usage in enough detail to assess life consumption against design life for applicable components;

(7) Discussion of any structural issues (such as modifications, fatigue, repairs, environmental wear and degradation) that require attention or are to be monitored for the upcoming reporting period;

(8) Description of currently on-going or planned projects and special activities related to the engine management, such as sampling inspection, follow-on full-scale/component structural test, coupon testing program, etc.;

(9) In-service failure reviews; and

(10) Listing of component improvement programs, or similar programs.

4. **Reporting.** The ESIMP shall be reviewed at least every two (2) years, with the end of the review schedule such that the review data and results are available for presentation to the Airworthiness Review Board (ARB) for that particular year.

5. **Approval.** The ESIMP must be approved by the TAA for initial approval and subsequent significant changes.

ADVISORY NOTE

Significant changes to an ESIMP include, but are not limited to, the following:

a. *Lifing policy update;*

b. *Changes in the usage tracking method (new analysis method, new instrumentation, changes from safe life to damage tolerant, etc.);*

c. *Overall aircraft life extension or ELE change;*

d. *Change of ESIMP contractor; and*

e. *Reduction in ESIMP activities due to impending retirement.*

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ANNEX D

AIRCRAFT ELECTRICAL WIRING INTERCONNECTION SYSTEM (EWIS) INTEGRITY MONITORING REQUIREMENTS

1. This Annex supplements Section 2 of this chapter. It amplifies the requirements of the aircraft Electrical Wiring Interconnection System (EWIS) integrity monitoring activities.

2. **Definition.** As used in this annex, Aircraft Electrical Wiring Interconnection System (EWIS) means any wire, wiring device, or combination of these, including termination devices, installed in any area of the airplane for the purpose of transmitting electrical energy, including data and signals, between two or more intended termination points. This includes:

a. wires and cables;

b. bus bars;

c. the termination point on electrical devices, including those on relays, interrupters, switches, contactors, terminal blocks and circuit breakers, and other circuit protection devices;

d. connectors, including feed-through connectors;

e. connector accessories;

f. electrical grounding and bonding devices and their associated connections;

g. electrical splices;

h. materials used to provide additional protection for wires, including wire insulation, wire sleeving, and conduits that have electrical termination for the purpose of bonding;

i. shields or braids;

j. clamps and other devices used to route and support the wire bundle;

k. cable tie devices;

l. labels or other means of identification;

m. pressure seals;

n. fiber optics;

o. EWIS components inside shelves, panels, racks, junction boxes, distribution panels, and back-planes of equipment racks, including, but not limited to, circuit board back-planes, wire integration units, aircraft stores and associated suspension equipment and external wiring of equipment.

ADVISORY NOTE

EWIS does not include components inside, and the external connectors that are part of, the following:

a. *electrical or avionic equipment (Weapon Replaceable Assembly (WRA)) installed in an aircraft rack or shelve; and*

b. *portable electrical devices that are not part of the type design of the airplane, such as personal entertainment devices and laptop computers.*

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3. **EWIS Monitoring Program**. An EWIS monitoring program shall be implemented for every aircraft type on the DND register. This program will include, without being limited to, the following components:

a. Evaluation of the inspection schedule, to ensure that the EWIS inspection program has sufficient coverage of the potential EWIS hazards. This evaluation should ensure:

(1) identification of EWIS within the inspection schedule;

(2) appropriate inspection tasks for EWIS, where a system failure will cause a significant hazard to the aircraft resulting from close proximity to:

(a) combustible materials;

(b) primary and back-up hydraulic systems; and

(c) mechanical or electrical flight controls;

(3) sufficient inspection tasks to evaluate EWIS condition for wear, wire bundle separation, cleanliness and proximity to physical objects, such as aircraft structure, rigid lines and Weapon Replaceable Assemblies (WRAs).

b. Evaluation through reliability and maintainability analysis of the effectiveness of the aircraft maintenance schedule tasks assigned to EWIS. This evaluation shall include reviews of both corrective and preventive maintenance findings that relate to EWIS failures.

c. Management of the aircraft Electrical Loads Analysis established during type certification, to ensure that EWIS design changes do not exceed load capacity of individual aircraft electrical systems or total capacity of the electrical generating system.

ADVISORY NOTE

Chapter 16 of Part 4, Section F of the Airworthiness Design Standards Manual*, C-05- 005-001/ AG-002 identifies the requirements for the development and management of an aircraft Electrical Load Analysis (ELA) for an aircraft type.*

4. **Corrective Action.** Where the aircraft EWIS integrity monitoring activities have identified a possible reduction in the level of aircraft safety, corrective action shall be taken in accordance with the requirements of 3.4.2.S1.2. Additional considerations for corrective action shall include:

a. changes to maintenance schedule task frequency or task instructions; and

b. changes to corrective maintenance instructions to enhance coverage of protection and caution information that will minimize contamination and accidental damage to EWIS, as applicable, during performance of maintenance or repairs.

5. **Reporting**. The Electrical Wiring Interconnection System Monitoring Program shall be reviewed at least every two (2) years, with the end of the review schedule such that the review data and results are available for presentation to the Airworthiness Review Board (ARB) for that particular year. Reporting will include results of data collected as per items listed in paragraphs 3 and 4 above.

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SECTION 3

ADVISORY MATERIAL (NOT ALLOCATED)

NOTE

In an effort to provide Advisory Material to TAM users as rapidly as possible, all applicable Advisory Material will be published in the form of TAA Advisories, and will be posted on the DTAES websites, which are updated regularly. The Advisory Material presented in this section will eventually be converted into a TAA Advisory.

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PART 4
DISPOSAL

CHAPTER 1 - DISPOSAL

SECTION 1

INTRODUCTION

4.1.1.1 Background

1. The disposal of aeronautical products is an important airworthiness consideration when managing aviation replacement parts. In this Chapter, the terms "aeronautical products" and "parts" are synonymous. The term "Disposal" is defined as the removal of surplus aeronautical products that are of no further use, from the military or civilian inventory. This situation may arise because the products that are of no further use, are beyond economical repair, obsolete, non-conforming, or surplus to requirement. The objectives in disposing of aeronautical products are to eliminate the possibility of parts that do not meet the approved type design being returned to service, by ensuring all aeronautical products are disposed of in an appropriate manner.

2. To implement measures to combat or control unapproved parts, it is necessary to understand what is meant by an approved part. In general, an approved part requires airworthiness certification documentation to prove product conformance and part manufacturing traceability or part usage/maintenance history depending on whether it is a new or used part. The documentation requirements in the procurement of aviation replacement parts intended for installation on military aeronautical products are specified in 5.2.2.S1.

3. Based on these approved parts requirements, an unapproved part generally falls into one of the following two categories:

a. **Undocumented Parts.** Products that do not have the proper airworthiness certification to prove:

(1) product conformance;

(2) manufacturing traceability; and/or

(3) part usage/maintenance history.

b. **Non-conforming Parts.** Products that are not authorized for use in an aeronautical product including:

(1) fraudulent or rejected manufactured parts;

(2) parts removed from service, which exceed approved wear/damage limits, with no repair potential;

(3) time expired shelf lifed parts;

(4) parts subjected to unacceptable modification or rework that is irreversible;

(5) parts that have been exposed to extreme forces or heat and cannot be restored by means of approved procedures;

(6) life limited parts (parts that, as a condition of the Type Certificate of an aeronautical product, may not exceed a specified time or number of operating cycles in service), which have consumed all of their approved service life or have missing or incomplete records; and

(7) parts that have failed the recertification process, as per 3.1.2.R13.

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4. The disposal of aeronautical products is an important consideration in the Technical Airworthiness Program for the following reasons:

a. **Moral Obligations.** DND would not be exercising "due diligence" if it did not support the efforts made by its civilian counterparts in the aviation community regarding the control of unapproved parts. In this regard, DND has established the minimum rules and standards in this Chapter to adequately control undocumented parts and non-conforming parts during the disposal of surplus military aeronautical products to the aviation parts market; and

b. **Self-protection.** To ensure the DND/CAF inventory of aeronautical products does not become corrupted with unapproved parts, effective disposal rules must be implemented to ensure that surplus non-conforming aviation parts do not find their way back into the supply system supporting military aeronautical products following disposal.

5. In order to meet our moral obligations, and in the interests of self-protection, non-conforming parts, as described in 4.1.1.1.3., shall require mutilation prior to their disposal. Mutilation of non-conforming parts must be accomplished in such a manner that the parts become unsalvageable and that rework or camouflage cannot restore such parts to the appearance of being serviceable by processes such as: replating, shortening and rethreading long bolts, welding, straightening, machining, cleaning, polishing, and repainting.

6. The two methods of disposal are as follows:

a. **Trash.** Trash is aeronautical products that have no repair potential and no potential value through future use or resale. Trash is disposed of locally, subject to federal, provincial, municipal laws or bylaws. Some examples include used seals and gaskets, used light bulbs, and broken plastic lenses; and

b. **Sales.** Aeronautical products may be sold as-is, either as approved parts, undocumented parts (subject to conditions), or as scrap. Scrap is material that has no real value except for its basic material content.

7. The disposal of military equipment, such as aircraft weapon systems, communications systems, armament systems, or any other military unique equipment requires special consideration (Canadian Controlled Goods Program, the US International Traffic in Arms Regulations) due to their military nature or use and/or for security reasons. The disposal of military equipment may include the involvement of other agencies or government departments, such as Foreign Affairs, Transport Canada or a foreign agency, such as the US Department of State. The involvement of other agencies may depend on factors such as the source or condition of the original purchase, the condition or type of equipment, the impact on another sector of the aviation community, or the intended buyer of the equipment. In addition, other factors such as environmental concerns, safety hazards and economic reasons may also influence the intended disposal of military equipment. These considerations are above and beyond the scope of the airworthiness rules and standards documented in this Manual.

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SECTION 2

RULES AND STANDARDS

4.1.2.R1 Mutilation of Non-conforming Aviation Replacement Parts

1. All non-conforming aviation replacement parts, as defined in 5.2.1.1.3, shall be mutilated in accordance with 4.1.2.S1,prior to disposal, with the exception of aeronautical products sold for non-flight use, as specified in 4.1.2.S2.2.a(2)(d).

ADVISORY NOTE

Aviation replacement parts do not include standard and commercial parts, as defined in 5.2.1.1.5.

4.1.2.S1 Mutilation of Non-conforming Aviation Replacement Parts

1. **Process Manual.** The Airworthiness Process Manual (APM) of the organization shall have a process to mutilate non-conforming aviation replacement parts that specifies the following requirements:

a. **When to Mutilate.** The manner in which it is determined when mutilation is required.

ADVISORY NOTE

The intent of this rule is to preclude the re-introduction of non-conforming aviation replacement parts into the aviation industry. There are, however, non-conforming aviation replacement parts that, due to their hazardous nature, may not be mutilated prior to disposal, such as explosive actuators, or parts that contain hazardous material, such as aircraft batteries. An organization's APM should specify how the organization will meet the intent of this rule when disposing of non-conforming aviation replacement parts that may not be mutilated prior to disposal.

b. **Method(s) Used.** The manner in which the method of mutilation is determined to ensure non-conforming aviation replacement parts are rendered unusable and non-repairable.

ADVISORY NOTES

1. *Actions (methods or means by which), such as drilling, grinding, cutting, melting or other appropriate means should be used to the extent necessary to preclude the possibility of the aviation replacement part being restored and returned to service.*

2. *The extent of mutilation should prevent the part being reworked by shortening, rethreading, welding, straightening and machining, or being camouflaged by replating, cleaning, polishing and repainting.*

3. *The following are examples of mutilation that are generally considered INEFFECTIVE:*

   a. *stamping;*

   b. *spraying with paint;*

   c. *hammer marks;*

   d. *identification by tags or markings;*

   e. *drilling small holes in a large part which could easily be restored by filling the holes; and*

   f. *sawing a large part into two pieces, which could easily be restored by welding.*

c. **Authorized Personnel.** The eligibility criteria for selecting personnel authorized to mutilate non-conforming aviation replacement parts, including:

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ADVISORY NOTE

The individual(s) in the organization who perform(s) the mutilation should be qualified and have the knowledge and experience to determine what means of mutilation is required to render the part non-repairable to the extent that it cannot be returned to service.

(1) the process used to ensure personnel meet the defined eligibility criteria prior to authorization; and

(2) the process used to control authorizations.

d. **Certificate of Mutilation.** The requirement for a certificate of mutilation, signed by an authorized individual, that ensures the particulars of the mutilation are recorded as follows:

(1) product identification, to include NATO stock number, part number, serial number, as applicable;

(2) date of mutilation;

(3) reason for mutilation;

(4) method of mutilation;

(5) signature of the authorized individual performing the mutilation; and

(6) enclosing identification plate(s) removed from the product, as applicable.

e. **Retention of Certificates of Mutilation.** The requirement for certificates of mutilation to be retained as part of the disposal record in accordance with 4.1.2.S2.2.c.

ADVISORY NOTE

An organization may enter into a support arrangement with another organization to mutilate aeronautical products, provided the requirements of 1.4.2.S1.5.d, are addressed in the TAA-approved APM. It includes the requirement for a certificate of mutilation to be completed, and a copy provided to the TAA-Acceptable Organization.

4.1.2.R2 Disposal of Aeronautical Products

ADVISORY NOTE

Aeronautical products include aviation replacement parts, and standard and commercial parts, as defined in 5.2.1.1.5.

1. The disposal of aeronautical products shall be conducted by organizations acceptable to the TAA, in accordance with 4.1.2.S2.

ADVISORY NOTE

Coordinating the disposal of DND-owned aircraft and the subsequent approval of a sale is the responsibility of the Director of Disposal, Sales, Artefacts, and Loans (DDSAL) in National Defence Headquarters. DDSAL coordinates the sale of DND-owned aircraft with the applicable Aircraft Engineering Officer (AEO), and the CAF marketing agent. AEOs, in addition to meeting 4.1.2.S2, are responsible for identifying any restrictions or conditions on the sale of DND-owned aircraft, including installed parts, to DDSAL. The CAF marketing agent is responsible for advertising the condition of aircraft "AS IS-WHERE IS", and ensuring potential buyers are aware of the requirement to obtain the required permits and approvals from the appropriate Government agencies, such as Transport Canada or the Federal Aviation Administration in the US, to operate the aircraft.

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4.1.2.S2 Disposal of Aeronautical Products

1. **Disposal Organization.** Disposal of aeronautical products shall be performed by organizations that are deemed acceptable by the TAA in accordance with Part 1, Chapter 4, and include disposal policies within their APM.

2. **Process Manual.** The APM of the organization shall have a process that specifies:

a. **Disposal Methods.** The methods used to dispose of aeronautical products, including:

(1) **Trash.** Trash that has no scrap value shall be disposed of locally, subject to federal, provincial and/or municipal environmental laws/bylaws.

(2) **Sales.** Aeronautical products shall be sold as follows:

(a) Approved aeronautical products, new or used, may be sold to any organization or individual when accompanied by proof of conformance documentation as specified in 5.2.2.S1.

ADVISORY NOTE

A used life limited part, with life remaining, may be sold as an approved aeronautical product when accompanied by a technical record as specified in 5.2.2.S1.

(b) New or used, undocumented aeronautical products may be sold to any organization or individual if the buyer accepts the sales condition that the parts are not certified by an inspector authorized by an aviation regulatory agency for use on any aeronautical product, providing:

i. the aeronautical product is not a life limited part with unknown in-service usage; or

ii. the aeronautical product has not failed to pass a recertification conducted in accordance with 3.1.2.S13.

ADVISORY NOTE

Aeronautical products that fail recertification are to be mutilated in accordance with 4.1.2.S1.

(c) Parts that have no future use in the maintenance of an aeronautical product may be sold for their intrinsic value as scrap.

ADVISORY NOTE

Examples of scrap are non-conforming parts that have been mutilated, and non-repairable, consumable parts, including standard and commercial parts.

(d) **Sale for non-flight use.** Any aeronautical product may be sold to a training, research and development, or artefact retention organization such as a museum, for legitimate non-flight uses provided the release and future ownership of the part is controlled to ensure it is not misrepresented as an approved part which may find its way back into aviation use. Prior to release of these parts for non-flight use, the following points shall be considered:

i. mutilating a portion of the part where practical;

ii. permanently marking or stamping of the part, subparts and material as "Not Serviceable". Ink stamping is generally not an acceptable method;

iii. defacing the original part number identification;

iv. removing any installed identification plates;

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v. maintaining a transferred part tracking system by serial number or other positive identification means; and

vi. establishing written control procedures concerning future disposition and disposal of such parts in any agreement or contract transferring such parts. Depending on the critical nature of the parts in aviation safety and the probability of material failure, non-conforming or time expired life limited parts shall not be released to any individual or organization that may represent a threat to placing the parts back into aviation use.

b. **Warehousing and Identification Requirements.** The manner in which parts being disposed of are stored and identified, ensuring that the following minimum requirements are satisfied:

(1) all aeronautical products being disposed of shall be segregated from airworthy products, and stored in a secure environment; and

(2) all products shall be tagged, or packaged with a label, indicating part identification, quantity, and condition.

ADVISORY NOTES

1. *Segregation of parts is applicable to maintenance organizations, or an organization with a parts inventory in support of a maintenance organization.*

2. *The condition of parts being disposed of may include, as applicable, new/serviceable, used/serviceable, unserviceable, scrap, obsolete, or beyond economical repair. Organizations may elect to create disposal codes that describe the condition of parts for disposal.*

c. **Disposal Records Management.** The manner in which the disposal of aeronautical products is documented, ensuring that records of disposal of all aeronautical products are retained for five years, following the date of the transaction, and specifically include:

(1) identification of the part(s);

(2) date of the disposal transaction;

(3) reason for disposal;

(4) method of disposal (e.g., approved part sale, undocumented part sale, scrap, sale to training or research and development organization);

(5) identification of the receiving organization/customer; and

(6) certificate(s) of mutilation, if applicable.

ADVISORY NOTES

1. *The organization that is in control and custody of an item prior to disposal should normally retain the disposal records. If this is not feasible, then the records should be retained by the Type Certificate Holder.*

2. *There is no requirement to document aeronautical products that are disposed of as trash.*

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SECTION 3

ADVISORY MATERIAL (NOT ALLOCATED)

NOTE

In an effort to provide Advisory Material to TAM users as rapidly as possible, all applicable Advisory Material will be published in the form of TAA Advisories, and will be posted on the DTAES websites, which are updated regularly.

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PART 5
AIRWORTHINESS PROCESSES

CHAPTER 1 - TECHNICAL AIRWORTHINESS RISK MANAGEMENT

SECTION 1

INTRODUCTION

5.1.1.1 Purpose

1. The purpose of this chapter is to provide the rules and standards related to performing technical airworthiness risk management, including the preparation and approval of the technical airworthiness content of a Record of Airworthiness Risk Management (RARM). A RARM is a document prepared in concert by both the Technical Airworthiness Authority (TAA) and Operational Airworthiness Authority (OAA), primarily when the airworthiness of an aeronautical product is assessed. The OAA has produced similar directions in 1 Canadian Air Division Orders related to the operational airworthiness content of a RARM and may utilize the document for any element of the OAA's responsibilities. The use of a RARM is predominantly associated with the in-service phase of an aeronautical product as other methods are available to manage risk during the certification process.

2. There are a number of reasons and circumstances whereby a risk assessment may be required or desirable. Not all of these risk assessments will result in the creation of a formal RARM. In most cases where a risk assessment conclusively indicates that the accepted level of safety is maintained, there is no requirement for a formal RARM development and submission. However, as described in the procedures governing these activities, the risk assessment must be documented and records produced to enable substantiation of the decision not to raise a RARM. Normally these records would be filed with the appropriate subject documentation, such as a request for a Flight Permit, an extension to or a deviation from a planned maintenance requirement, etc. The decision as to whether or not a RARM is required is based on sound engineering principles and judgement, and is to be made by an appropriate level of authority (Director, Weapon Systems Manager, Senior Design Engineer, etc.) with the advice of the TAA staff. Processes governing the specific activities will include the requirement to conduct and document a risk assessment and as such are beyond the scope of this chapter.

3. The approval of the technical airworthiness content of a RARM does not constitute authority to accept the risk described nor does it permit flight with the residual risk. The decision to accept risk and authorize missions is made by an authorized individual within the operational chain of command. This Risk Acceptance is the point at which the airworthiness risk management procedure interfaces with the chain of command.

4. This Chapter defines four risk levels: Low, Medium, High and Extremely High. These levels are established whenever a situation is identified that places an aircraft or a fleet of aircraft at a risk level above the accepted level of safety. The Technical Airworthiness Program does not require further measures to lower risk once the risk level has been again reduced to within the accepted level of safety. However, this chapter does note that there may be other reasons outside of the airworthiness program requiring additional risk lowering measures.

5.1.1.2 Overview

1. The primary objective of the*Aeronautics Act* is to provide an acceptable level of safety for civil and military aviation in Canada. The Technical Airworthiness Program contributes to this aviation safety goal by regulating the technical aspects of aviation-related activities to ensure the safe flight and landing of aircraft in all reasonable conditions and situations.

2. Imperatives, such as mission accomplishment, available resources and schedule constraints may at times conflict with technical airworthiness rules and standards. As a result, individuals within TAA-Acceptable Organizations involved with the design, manufacture, maintenance and materiel support of aeronautical products may be required to make a decision or recommendation involving a balance between aviation safety requirements and other imperatives.

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3. The DND/CAF Airworthiness Program provides a logical and systematic means to:

   a. identify conditions and situations that may result in an unacceptable level of safety;

   b. provide a measure of the airworthiness risk; and

   c. control the implementation of risk reduction or mitigation measures.

4. The key document in the process of managing airworthiness risk is identified as the RARM, which is created by input from both the TAA and OAA. This chapter identifies the rules and standards applicable to the technical airworthiness portion of the RARM and provides details and guidance on a risk management procedure designed to ensure technical airworthiness is maintained to acceptable standards.

5. The RARM is a record of the results of the five steps of an acceptable risk management procedure; these steps are described below:

   a. **Hazard Identification.** Identifies the potential mishaps to an aeronautical product that may arise from a particular root cause in conjunction with possible hazard conditions.

   b. **Risk Assessment.** Identifies the level of risk by taking into consideration the severity and probability of occurrence of the potential hazard.

   c. **Risk Control.** Identifies the options that are available to eliminate, reduce and/or mitigate the assessed risk and the rationale for the selection of the recommended options.

   d. **RARM Approval.** Identifies the requirement for specific authorized individuals to approve a RARM dependent on the level of risk identified. Describes the approval responsibilities, which include verifying the technical airworthiness content and ensuring that the risk management procedures were followed.

   e. **Risk Tracking.** Identifies measures to ensure the RARM is appropriately documented and that risk control measures are implemented and monitored for effectiveness.

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SECTION 2

RULES AND STANDARDS

5.1.2.R1 Record of Airworthiness Risk Management (RARM)

1. The RARM process shall be initiated in accordance with 5.1.2.S1, by individuals within a TAA-Acceptable Organization whenever it is perceived that there is the potential for a technical airworthiness related risk situation at a risk index greater than the Accepted Level of Safety. The Accepted Level of Safety is determined during the certification of a new aircraft type design and is formally defined in the approved Certification Basis for that type design.

ADVISORY NOTE

An equivalent responsibility exists for the Operational Airworthiness Authority (OAA) to initiate a RARM to determine risk scenarios that are driven primarily by operational airworthiness factors.

5.1.2.S1 Record of Airworthiness Risk Management (RARM)

1. The RARM is a document that records the five steps of an approved airworthiness risk management procedure:

   a. Hazard Identification.

   b. Risk Assessment.

   c. Risk Control.

   d. RARM Approval, and

ADVISORY NOTE

The decision and the authority to accept the risk described in the RARM are functions of the Operational Command Authority. This Risk Acceptance is the point at which the Airworthiness Risk Management process interfaces with the operational chain of command.

   e. Risk Tracking, including re-evaluation of risk, as necessary.

2. An airworthiness risk management procedure acceptable to the TAA is provided in the Director General Aerospace Equipment Program Management (DGAEPM) AF9000 Plus Manual of Aerospace Procedures (MAP) (DG01.003). Each TAA-Acceptable Technical Organization shall adapt this procedure and tailor it to their organization structure, personnel and authorities. A RARM shall be staffed in accordance with the airworthiness risk management procedure documented in the organization's Airworthiness Process Manual (APM). For each revision of a RARM with a Risk Index higher than Medium that requires Risk Acceptance, this staffing process shall ensure that TAA staff is involved in the development, review, and approval of the RARM.

3. **Hazard Identification.** A RARM shall include the identification of hazard cause(s), including the root cause or initiator, and hazard condition(s) that can be expected to be associated with the root cause leading to a description of the potential range of hazard effects or mishaps that could result. Engineering rigour must be applied to the assessment of hazard effects to ensure the scope and depth of the investigation is sufficient to identify root cause and the potential mishaps that may arise. The hazard identification section of the RARM shall be sufficiently comprehensive to demonstrate the adequacy of the scope and depth of the investigation and substantiate the selection of applicable hazard effects.

4. **Risk Assessment.** A RARM shall include a risk assessment describing the Hazard Severity, the Qualitative and/or Quantitative Hazard Probability and the resulting Risk Index using the descriptors cited in Figure 5-1-2-1, Figure 5-1-2-2, Figure 5-1-2-3 and Figure 5-1-2-4. A separate probability rating is required for each hazard effect scenario, leading to a separate risk index for each. The risk assessment section of the RARM shall be sufficiently comprehensive to substantiate the risk indices selected.

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5. When a RARM identifies a Hazard Condition that affects the ability of an aircraft's occupants or crew to survive an accident or incident, a "Survivability Risk Index" is required. The Survivability Risk Index provides an indication of the risk that would be faced by the crew and occupants if it is assumed that an aircraft accident or incident has occurred and that the subject Hazard Condition is involved. To derive a Survivability Risk Index, the hazard condition, causes and effects are evaluated against the descriptors cited in Figure 5-1-2-5 and Figure 5-1-2-6. Then, a Survivability Risk index is derived using Figure 5-1-2-4.

Hazard Severity		Definition
Description	**Category**	
Catastrophic	A	All hazard conditions that would prevent continued safe flight and landing. Could result in death of the aircrew, normally with loss of the aircraft.
Hazardous	B	Hazard conditions that would reasonably be expected to result in a large reduction in safety margins or functional capabilities, including higher aircrew workload or physical distress such that the aircrew may not be relied upon to perform tasks accurately or completely. Could result in death or major injury to aircraft occupants or major damage to an aircraft system. Could result in death or major injury to ground personnel or the general public.
Major	C	Hazard conditions that would reasonably be expected to result in a moderate reduction in safety margins or functional capabilities, including a moderate increase in aircrew workload or physical distress impairing crew efficiency. Possible physical distress, including injuries to occupants or minor damage to an aircraft system.
Minor	D	Hazard conditions that would not significantly reduce aircraft safety, but would reasonably be expected to result in a slight reduction in safety margins or a slight increase in aircrew workload.
Negligible	E	No effect on safety. Negligible effect on safety margins.

Figure 5-1-2-1 Hazard Severity

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Description	Level	Qualitative Definition	Life of Individual Aeronautical Product	Life of Entire Fleet	Individual Aircrew Career	All Exposed Personnel
Frequent	1	Likely to occur frequently.	Expected to occur frequently during the operational life of an individual aircraft.	Occurs continuously to the entire fleet.	Expected to frequently occur during an individual's career.	Occurs continuously to the entire population.
Probable	2	Expected to occur one or more times.	Expected to occur one or more times during the operational life of an individual aircraft.	Likely to occur several times per year to the entire fleet.	Expected to occur one or more times during an individual's career.	Likely to occur one or more times per year to the aircrew population.
Remote	3	Unlikely, but possible to occur.	Unlikely, but possible to occur during the operational life of an individual aircraft.	May occur one or more times per year to the entire fleet.	Unlikely, but possible to occur during an individual's career.	May occur one or more times per year to the aircrew population.
Extremely Remote	4	Not expected to occur.	Not expected to occur during the operational life of an individual aircraft.	May occur one or more times during the entire operational life of the entire fleet.	Not expected to occur during an individual's career.	May occur one or more times to the entire aircrew population.
Extremely Improbable	5	So unlikely, it may be assumed that it will never occur.	So unlikely, it may be assumed that it will never occur during the entire operational life of all aircraft of the type.			

Figure 5-1-2-2 Qualitative Hazard Probability

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Hazard Probability Level	Hazard Probability Thresholds (Per Flight Hour)			
	DND Passenger Carrying Aircraft (Derived from FAR 25/29 Civil Designs)	**Military Aircraft**	**Military Aircraft - Ejection Seat Equipped**	**Unmanned Aircraft (UA) Above 150 kg Take-off Weight**
Frequent	Greater than 1×10^{-3}	Greater than 1×10^{-3}	Greater than 1×10^{-3}	Greater than 1×10^{-2}
Probable	Less than 1×10^{-3}	Less than 1×10^{-3}	Less than 1×10^{-3}	Less than 1×10^{-2}
Remote	Less than 1×10^{-5}	Less than 1×10^{-5}	Less than 1×10^{-4}	Less than 1×10^{-3}
Extremely Remote	Less than 1×10^{-7}	Less than 1×10^{-6}	Less than 1×10^{-5}	Less than 1×10^{-5}
Extremely Improbable	Less than 1×10^{-9}	Less than 1×10^{-8}	Less than 1×10^{-7}	Less than 1×10^{-6}

Figure 5-1-2-3 Quantitative Hazard Probability

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Hazard			Category				
Probability		Severity	A	B	C	D	E
			Catastrophic	Hazardous	Major	Minor	Negligible
LEVEL	1	Frequent	A1 Extremely High	B1 Extremely High	C1 Medium	D1 Low	E1
	2	Probable	A2 Extremely High	B2 High	C2 Low	D2	E2
	3	Remote	A3 High	B3 Medium	C3	D3	E3
	4	Extremely Remote	A4 Medium	B4	C4	D4	E4
	5	Extremely Improbable	A5	B5	C5	D5	E5

Risk Threshold

NOTE

Risks below the Risk Threshold are considered to be within the Acceptable Level of Safety for all approved missions and flying operations.

Figure 5-1-2-4 Risk Index

Hazard Severity		Definition
Description	***Category***	
Catastrophic (S)	A	Hazard conditions that, from a single point of failure, would result in multiple fatal injuries to the flight crew and/or occupants. Extreme threat to survivability.
Hazardous (S)	B	Hazard conditions that would reasonably be expected to cause very serious (incapacitation) or fatal injuries to any of the flight crew and/or occupants. High threat to survivability.
Major (S)	C	Hazard conditions that would reasonably be expected to result in serious injuries (limited functionality) to flight crew, or other occupants. Moderate threat to survivability.
Minor (S)	D	Hazard conditions that would not likely cause life-threatening injuries. Minor injuries to flight crew, and/or other occupants could occur. Low threat to survivability.
Negligible (S)	E	No effect on Survivability. No injuries expected.

Figure 5-1-2-5 Survivability Hazard Severity Definitions

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Assuming that 10 accidents have occurred, all requiring the use of the ALSE, which is the subject of the RARM, determine the probability of the Hazard Effect.		
Description	**Level**	**Qualitative Definition**
Frequent (S)	1	Greater than 50%
Probable (S)	2	Less than or equal to 50%
Remote (S)	3	Less than or equal to 25%
Extremely Remote (S)	4	Less than or equal to 10%
Extremely Improbable (S)	5	Less than or equal to 5%

Figure 5-1-2-6 Survivability Hazard Probability Definitions

6. **Risk Control.** A RARM shall include a description of a risk control plan describing options leading to the elimination, reduction and/or mitigation of the assessed risk. Options shall include a description of the residual risk at each stage. The risk control plan shall contain an options analysis with recommendations to resolve the airworthiness risk problem. The risk control portion of the RARM shall be sufficiently comprehensive to substantiate the options analysis and recommended choice of action. Each mitigating activity included in the recommended course of action shall identify an Office of Primary Interest (OPI) that will be responsible for completing that activity. The airworthiness program will strive to reduce risk to within the accepted level of safety.

ADVISORY NOTE

There may be occasions where additional risk reducing measures are appropriate despite reaching an accepted level of safety. The application of the "as low as reasonably practicable" principle can be considered to assess whether any additional measures are required, but this action is outside of the provisions of the Technical Airworthiness Program.

7. **RARM Approval.** A RARM shall include TAA- and OAA-authorized individuals' signatures. The TAA's signature:

a. approves the technical airworthiness content of the RARM and confirms that the TAA-approved risk management procedures were followed;

b. approves the technical airworthiness content of the risk control plan and concurs that the plan will reduce and mitigate the risk as detailed in the RARM; and

c. ensures that responsibilities have been assigned for the implementation of all requirements detailed in the risk control plan and for monitoring the risk level to ensure that the risk control plan is effective. This includes amending the RARM whenever the risk level changes or the risk control plan is modified.

8. The OAA's signature indicates approval of the operational airworthiness content of the RARM, the risk control plan and the implementation of applicable operational airworthiness steps.

9. The technical content of a RARM shall be approved by an authorized individual as listed in Figure 5-1-2-7. If, for any reason, the situation requires a revision to the RARM, the level of the risk identified in the revision of the RARM shall be used to select the appropriate approval authority. There is also a requirement for an independent TAA staff review for a RARM with a Risk Index of High or Extremely High, regardless of who signs for technical airworthiness approval. RARMs documenting a Hazard Condition that affects the ability of an aircraft's occupants or crew to survive an accident or incident shall be staffed for approval in accordance with the higher of the airworthiness risk index and the survivability risk index.

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Risk Index	Technical Airworthiness Approval Authority NOTE 1	Operational Airworthiness Approval Authority	Operational Acceptance Authority
Extremely High	TAA or DTAES NOTE 2	OAA	CAS
High	SDE or individual authorized by the SDE, when the SDE is absent NOTE 2	Senior Operational Airworthiness Manager	Comd 1 Cdn Air Div
Medium A4, B3	SDE or individual authorized by the SDE, when the SDE is absent	Senior Operational Airworthiness Manager	Comd 1 Cdn Air Div
Medium C1		Divisional Operational Airworthiness Manager	DComd FG/DComd Msn Sp
Low	Individual authorized by the SDE	Divisional Operational Airworthiness Officer	1 Cdn Air Div Directors
Within Acceptable Level of Safety	Individual authorized by the SDE	Not required for TAA Originated RARM NOTE 3	Not Required

NOTES

1. *Technical Airworthiness Approval of RARMs is performed by authorized personnel working in organizations that are Type Certificate Holders or by TAA staff. The Technical Airworthiness Approval authority indicated in this table is the lowest level authorized. At any time, a higher level of authority can perform the Technical Airworthiness Approval. For clarity, the hierarchy of Technical Airworthiness Authority, from lower to higher is Authorized Individual, SDE, DTAES and TAA.*
2. *For a Risk Index of High or Extremely High, regardless of who signs for technical airworthiness approval, the completion of an independent TAA staff review must be indicated on the RARM sign-off page.*
3. *For a Risk Index that is within the Acceptable Level of Safety, no OAA Approval is required unless the Risk Control Plan of the RARM includes risk control activities for which the OAA staff are responsible to implement. In this case, OAA approval shall be obtained from the Divisional Operational Airworthiness Manager.*

Figure 5-1-2-7 RARM Airworthiness Approval and Acceptance Authority

10. **Risk Tracking.** A RARM shall include a description of risk tracking demonstrating that the approved risk control plan implementation measures are monitored to ensure that:

a. all requirements detailed in the risk control plan are implemented;

b. the risk control plan is effective at reducing the risk level; and

c. the RARM is amended when the risk level changes or risk control plan is modified.

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11. **Airworthiness Risk Alerts.** It is imperative that a RARM be initiated as soon as a potential risk situation that could degrade the level of safety of an aircraft or a fleet is identified.

12. The purpose of the Airworthiness Risk Alert is to advise all stakeholders of:

a. the situation;

b. the actions being taken to fully assess and document the actual risk level; and

c. any mitigating actions planned or implemented as interim measures.

13. The content of the Airworthiness Risk Alert is based upon the preliminary information that is available at the time of submission and is similar to that described in 5.1.2.S1.1. The RARM shall be staffed as soon as possible for review and approval by the appropriate authority. It is important to include the action(s) being taken to fully develop the subsequent revision of the RARM.

5.1.2.R2 RARM Management

1. A RARM shall be managed in accordance with 5.1.2.S2.

5.1.2.S2 RARM Management

1. A RARM shall be closed by authorized personnel listed in Figure 5-1-2-7, when all required mitigating actions have been completed and the post-mitigation risk has been lowered to within the Acceptable Level of Safety, as shown in Figure 5-1-2-4.

2. A RARM with a Risk Index that is not within the Acceptable Level of Safety and for which no mitigating action has been implemented or for which the mitigating action has yet to be completed, is considered Open-Active and is to be monitored and updated by the Senior Design Engineer (SDE) as the risk situation evolves.

3. A RARM with a Risk Index that is not within the Acceptable Level of Safety for which no further mitigating action is possible or practicable and which has been accepted by the appropriate Operational Acceptable Authority is considered Open-Inactive. These are to be monitored and reviewed, at intervals specified by the SDE.

5.1.2.R3 Risk Assessment Records

1. All RARM and other risk assessment records shall be maintained as described in 5.1.2.S3.

5.1.2.S3 Risk Assessment Records

1. All versions of a RARM shall be recorded in a designated database by the applicable Weapon Systems Manager. Databases for each aircraft type are to be created, maintained and made available for viewing by all stakeholders.

2. Risk assessments that do not result in a formal RARM shall be documented and placed in the appropriate subject files.

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SECTION 3

ADVISORY MATERIAL (NOT ALLOCATED)

NOTE

In an effort to provide Advisory Material to TAM users as rapidly as possible, all applicable Advisory Material will be published in the form of TAA Advisories, and will be posted on the DTAES websites, which are updated regularly.

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PART 5
AIRWORTHINESS PROCESSES

CHAPTER 2 - PROCUREMENT AND CONTROL OF AVIATION REPLACEMENT PARTS

SECTION 1

INTRODUCTION

5.2.1.1 Background

1. Airworthiness is an important consideration in the procurement and control of replacement parts and materials for use on an aeronautical product. This includes new parts, used parts, repaired parts including repair and overhaul and raw materials used in the repair or manufacture of aeronautical products. For the purposes of this Chapter, the term "replacement part" is used to refer to all of these items. Organizations must ensure that appropriate steps are taken during the procurement and control of replacement parts to ensure that only approved parts are available for use on an aeronautical product.

2. All replacement parts fall into one of two broad categories:

   a. **Approved** replacement parts are those parts, which are:

      (1) accompanied by appropriate documentation certifying their conformance to the approved type design; and

      (2) received from sources acceptable to the TAA.

   b. **Unapproved** replacement parts are those parts that do not meet all the criteria of an approved replacement part, including:

      (1) missing or insufficient documentation certifying their conformance to the approved type design;

      (2) cannot be traced to an acceptable source;

      (3) insufficient maintenance history if applicable;

      (4) damage during shipment or handling;

      (5) failing an organization's incoming inspection; or

      (6) becomes suspect for any reason throughout the life of the part.

3. Within the category of unapproved parts, replacement parts may be determined to be non-conforming parts. Non-conforming parts are unapproved parts that cannot be certified as approved parts and include:

   a. fraudulent or rejected manufactured parts;

   b. parts removed from service which exceed approved wear/damage limits, with no repair potential;

   c. time-expired shelf lifed parts;

   d. parts subjected to unacceptable modification or rework that is irreversible;

   e. parts that have been exposed to extreme forces or heat and cannot be restored by means of approved procedures;

   f. life-limited parts (parts that, as a condition of the Type Certificate of an aeronautical product, may not exceed a specified time or number of operating cycles in service), which have consumed all of their approved service life or have missing or incomplete records; and

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g. parts that have failed the recertification process as per 3.1.2.R13.

4. A part only becomes non-conforming after every attempt to confirm its status as an approved part has failed. Once a part has been determined to be non-conforming, that part must be disposed of in such a way as to preclude the possibility of its future use in any aeronautical product, as specified in Part 4, Chapter 1.

5. The replacement part procurement and control processes must adequately address all airworthiness compliance and conformance requirements to assure the airworthiness of aeronautical products. Therefore, the necessary airworthiness requirements for the procurement and control of replacement parts must be stipulated within the Airworthiness Process Manual (APM) of any organization that will be conducting airworthiness-related activities on aeronautical products. The organization's processes must ensure that all parts available for use on an aeronautical product are approved parts and adequate provisions are in place to protect the parts until they are used. In the Technical Airworthiness Program, this is accomplished by defining airworthiness requirements to encompass:

a. the procurement of replacement parts, including the required documentation to prove conformance with the applicable approved type design and satisfactory evidence that the part has been procured from an acceptable source; and

b. the control of replacement parts and associated documentation from receipt in an organization until use on an aeronautical product.

6. In order to facilitate procurement and disposal requirements, replacement parts have been broken down into the following classifications:

a. **Aviation Replacement Parts.** Consists of replacement parts designed for aviation use including:

(1) **Major Equipment.** Consists of complete aircraft, engines and propellers; and

(2) **Components and Appliances.** Consists of auxiliary power units (APU), lifed items, items with a fixed overhaul and/or maintenance schedule and any item where failure of the item would compromise the safe takeoff, flight or landing of the aircraft.

b. **Standard/Commercial Parts.** Standard parts consist of common hardware parts and raw materials, not necessarily designed for aviation use, produced to recognized industry or government specifications which are available without proprietary limitations such as Society of Automotive Engineers (SAE), National Aerospace Standard (NAS), Army-Navy Aeronautical Standard (AN), and Military Standard (MS) hardware items. Commercial parts consist of common non-aeronautical parts produced to recognized industry specifications and available on the commercial market. Examples include some oil filters, pumps, valves, generators and voltage regulators, designed and manufactured for the automobile industry. Many board level electronic components such as resistors, transistors, capacitors, etc. are also commercial parts. Generally, Petroleum, Oil and Lubricants (POL) products will fall into either the standard or commercial category. Standard and commercial parts may be used on an aeronautical product when the part number is included without alteration in the approved type design for the aeronautical product. A commercial part may only be used on an aeronautical product when failure of the part will not adversely affect the continued safe flight and landing of an aircraft.

7. The control of replacement parts from receipt until issue is an essential process in ensuring that technicians only receive approved replacement parts for installation on an aeronautical product. Replacement parts control processes include:

a. incoming inspections;

b. unapproved parts control;

c. documentation control;

d. packaging;

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e. handling;

f. storage;

g. shelf life control; and

h. transport.

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SECTION 2

RULES AND STANDARDS

5.2.2.R1 Procurement of Replacement Parts

1. A replacement part procured for use on an aeronautical product shall have proof of conformance to the applicable approved type design as specified in 5.2.2.S1.

2. A replacement part procured for use on an aeronautical product shall be procured from sources acceptable to the TAA as specified in 5.2.2.S1.

ADVISORY NOTES

1. *For the purposes of this chapter of the TAM, replacement part is interpreted to mean new parts, used parts, repaired parts including repair and overhaul and raw materials used in the repair or manufacture of aeronautical products.*

2. *The rules and standards in this chapter also apply to the procurement of substitute parts and materials approved in accordance with either Part 3, Chapter 1, during the performance of maintenance or Part 5, Chapter 4, during manufacture.*

3. *An approved substitute part or material is interchangeable with the one in the approved type design in that it has either identical or similar but suitable characteristics to permit its use without change to the aeronautical product.*

4. *Additional information in regard to the process for the selection and approval of a substitute is provided in Part 3, Chapter 1 and Part 5, Chapter 4, as applicable. Procurement of a substitute may require submission of drawings, specifications and identification of manufacturer for review and approval by an authorized individual.*

5. *Additional guidance on the procurement of Petroleum, Oil and Lubricant (POL) products is provided in C-82-005-001/AM-003* - Minimum Quality Surveillance of Petroleum Products*, C-82-010-007/TP-000* - Procedures and Responsibilities for Aviation Fluids Handling *and A-LM-188-001/JS-001* - Supply Manual for POL/Fuel Handling.

5.2.2.S1 Procurement of Replacement Parts

1. The proof of conformance shall consist of documentation that provides sufficient information to demonstrate that the replacement part is an approved part for the intended use on an aeronautical product in accordance with:

   a. Part 3, Chapter 1, for the performance of maintenance on an aeronautical product; or

   b. Part 5, Chapter 4, for the manufacture of an aeronautical product.

ADVISORY NOTE

Replacement parts manufactured under a Federal Aviation Administration (FAA) Parts Manufacturing Approval (PMA) have been deemed by the FAA as acceptable "in lieu of" items. Both Transport Canada (TC) and the TAA have recognized PMA parts as being equivalent to the original part number. The TCH may accept PMA parts in lieu of the part number specified in the approved maintenance program for an aeronautical product without further investigation provided that acceptable evidence, showing that the part was manufactured under a PMA directly linked to the original part number, is provided with the part.

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2. The minimum documentation to provide proof of conformance depends on whether the replacement part is new or used and whether it is considered an aviation replacement part or a standard/or commercial part as follows:

a. Proof of conformance for new aviation replacement parts includes:

(1) a certificate of conformance signed by an authorized individual from an acceptable manufacturer as specified in 5.4.2.S1.1, for aeronautical products; or

(2) a certificate of conformance issued by:

(a) an authorized inspector in accordance with the Canadian Aviation Regulations (CAR);

(b) a FAA-authorized inspector on behalf of a United States-based manufacturer or distributor; or

(c) another user of the aeronautical product provided proof of traceability to a manufacturer acceptable to the TAA in accordance with 5.4.2.S1, is supplied.

ADVISORY NOTES

1. *Manufacturing product conformance certification, in accordance with 5.4.2.S7.1, is normally indicated on a Certificate of Conformance or Release Certificate issued by the manufacturer who produced the part. Acceptable certificates for a newly manufactured part include:*

   a. *a FAA Airworthiness Approval Tag (FAA Form 8130-4 for major equipment or 8130-3 for components and appliances or standard/commercial parts) signed by an authorized FAA representative;*

   b. *a Transport Canada Form TCCA 24-0078, Authorized Release Certificate, a Joint Aviation Authority (JAA) Form One, Authorized Release Certificate signed by an authorized JAA inspector; and a European Aviation Safety Agency (EASA) Form One, Authorized Release Certificate signed by an authorized EASA inspector;*

   c. *for a locally manufactured part, a Maintenance Release form completed in accordance with an Acceptable Maintenance Organization's MPM provided it satisfies the requirements of 5.4.2.S7.1; or*

   d. *a Certificate of Conformance or Release Certificate issued in accordance with an acceptable manufacturer's approved procedures provided it satisfies the requirements of 5.4.2.S7.1.*

2. *More than one item may be included on a certificate of conformance provided there is only one destination for all the items and each item is clearly identified and described.*

3. *Parts received through foreign military supply arrangements, such as COLOG, may not be acceptable unless provisions are made to address the proof of conformance requirements.*

4. *In accordance with US DoD regulations, an item identified as being a flight safety critical aircraft part (FSCAP) should be received with a FAA Form 8130-3 or 8130-4, Airworthiness Approval Tag, if that part has a commercial application. FAAAC 20-142 provides additional information regarding the FSCAP designation of parts.*

b. Proof of conformance for used aviation replacement parts includes:

(1) evidence of proof of conformance consisting of a Maintenance Release signed by an authorized individual within a maintenance organization acceptable to the TAA as defined in 3.1.2.S1 and either:

(a) the original manufacturing product conformance certification or the material product conformance certification as described in 5.2.2.S1.2.a; or

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(b) identification of the aeronautical product from which the part was removed provided sufficient historical information is supplied with the used part to prove that it is an authentic part; and

(2) usage and maintenance historical information necessary to return the part to service including:

(a) Airworthiness Directive status or equivalent;

(b) modification status;

(c) maintenance record of the last servicing/repair (tear-down report) listing major parts replaced, or for life-limited parts, of the last overhaul and any other maintenance accomplished since the last overhaul including the appropriate maintenance release certifications; and

(d) for life-limited parts, total hours and/or cycles on the part since new and any usage history, which may impose a penalty to the remaining life of the part.

ADVISORY NOTES

1. *For used parts, it is possible that the original certificate of conformance may no longer be available. Therefore, identification of the aeronautical product from which the part was removed may be the only means available to provide evidence of proof of conformance. The types and extent of historical information to be supplied with the part should be determined on a case by case basis depending on factors such as:*

   a. *the criticality and intended usage of the part;*

   b. *the trust the buyer has in the seller;*

   c. *the accuracy and completeness of the available historical usage and maintenance information; and*

   d. *the Technical Record requirements of the intended aeronautical product on which the part will be installed.*

2. *If any doubt exists as to the authenticity of the part, then it should be subjected to parts recertification, in accordance with 3.1.2.R13.*

c. Proof of conformance for standard/commercial parts includes:

(1) a certificate of conformance signed by an authorized individual from an acceptable manufacturer as specified in 5.4.2.S1.2, for standard parts or 5.4.2.S1.3, for commercial parts; or

(2) information contained on the labelling, packaging or accompanying documentation including:

(a) identification of the manufacturer;

(b) identification of the manufacturing standard and or manufacturer's part number and model number as applicable;

(c) identification of the lot or batch number if applicable; and

(d) cure date/shelf life if applicable.

ADVISORY NOTES

1. *It is anticipated that only new standard/commercial parts will be procured for use on an aeronautical product. If a situation arises where only a used standard or commercial part is available, the TCH may authorize the procurement of a used standard/commercial part if, after consideration of all the factors, the risk is considered negligible.*

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2. *For some products, such as tires, paints, adhesives and sealants, reliance on the standard may not provide adequate assurance as to the quality of the product. In these instances, the TCH should develop and maintain a qualified products list based on research and testing of the product.*

3. Organizations acceptable to the TAA as sources of approved parts include:

   a. Original Equipment Manufacturers (OEM);

   b. TAA AMfgO;

   c. OEM-approved distributors;

   d. TC-approved distributors;

   e. Aviation Suppliers Association (ASA) accredited distributors;

   f. TC AMO;

   g. TAA AMO; and

   h. FAA certificated repair stations.

ADVISORY NOTES

1. *An organization may include, in its Airworthiness Process Manual (APM), a process to qualify sources used in the procurement of replacement parts other than those listed in 5.2.2.S1.3. This process should satisfy the TCH that each source of replacement parts to be used will only supply approved parts and should, as a minimum, include a review and acceptance of each source's:*

   a. *documentation procedures;*

   b. *receiving, storage and shipping procedures; and*

   c. *quality management system.*

2. *For reference purposes, Transport Canada, the Federal Aviation Administration, and Aviation Suppliers Association identify approved, accredited or certificated organizations on their respective Internet websites.*

5.2.2.R2 Replacement Parts Control

1. Replacement parts shall be controlled from receipt until they are used on an aeronautical product as specified in 5.2.2.S2.

5.2.2.S2 Replacement Parts Control

1. A replacement part intended for use in the performance of maintenance on an aeronautical product in accordance with Part 3, Chapter 1, or in the manufacture of aeronautical products in accordance with Part 5, Chapter 4, must be controlled to ensure adequate measures are taken to protect the part and associated documentation. This control is necessary to assure the continuing airworthiness of the aeronautical product on which the replacement part is used. Replacement parts control includes:

   a. incoming inspections;

   b. unapproved parts control;

   c. documentation control;

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d. packaging;

e. handling;

f. storage;

g. shelf life control; and

h. transport.

2. **Incoming Inspections.** An incoming inspection shall be performed on all replacement parts received by an organization conducting airworthiness-related activities on aeronautical products. The incoming inspection shall be performed by an authorized individual in accordance with the material control process stipulated in the APM of the organization prior to releasing the affected part for use on an aeronautical product. The incoming inspection process shall include but is not limited to:

a. a check for any obvious physical damage including corrosion;

b. verifying that the appropriate plugs and caps are installed;

c. verifying that part numbers, including dash numbers and letters, model numbers, serial numbers, lot and/or batch numbers of the items match the contract, demand or project tasking as appropriate;

d. verifying shelf life or life remaining for life-limited components are within specified limits;

e. specification compliance check as determined by the criticality of the part and the level of confidence in the source of supply;

ADVISORY NOTE

The scope and depth of the specification compliance check is normally determined by the Type Certificate Holder for the aeronautical product and may be specified in the procurement instrument.

f. verifying that packaging is appropriate; and

g. verifying that all required proof of conformance and traceability documentation is supplied as specified in the applicable contract or purchase order including:

(1) proof of conformance and any associated maintenance or usage information in accordance with 5.2.2.S1; or

(2) parts recertification documentation and any associated maintenance and usage information, in accordance with 3.1.2.S13.

ADVISORY NOTE

The incoming inspection may be conducted by the organization which will use the replacement part or the supply organization which provides support to that organization provided it is performed in accordance with the TAA-approved material control process by an authorized individual who has the required knowledge, experience and skills.

3. **Unapproved Parts Control.** Upon discovery of an unapproved part from the incoming inspection, the organization in control and custody of the part shall quarantine the affected part or material and initiate action to resolve the situation. The action to be taken depends on the reason the part was declared unapproved. The action to be taken shall include as applicable:

a. obtaining any missing documentation;

b. referring unapproved part and associated documentation to an organization acceptable to the TAA for recertification in accordance with 3.1.2.R13; or

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c. disposal of the part in accordance with Part 4, Chapter 1.

ADVISORY NOTE

If the unapproved part is suspected or confirmed to be a non-conforming part, then the reporting provisions of Part 3, Chapter 4, will apply.

4. **Documentation Control.** The airworthiness status of a part often cannot be determined by a simple visual inspection and many critical properties of a part cannot be verified on a finished product without disassembly or destruction such as surface finish prior to plating. Therefore, proof of conformance and traceability documentation control requirements include:

a. documentation shall be retained with the replacement part until it is installed on an aeronautical product;

b. in the event of a part being redistributed to another location or organization, documentation shall accompany the part; and

c. after installation, the necessary documents shall be filed in accordance with the Technical Record procedures for the aeronautical product on which it was installed or the Organizational Record procedures as applicable, in accordance with Part 5, Chapter 5.

5. Reproduction of proof of conformance and traceability documentation is permitted where multiple copies are required. This includes situations when two parts are delivered under one set of documentation and the parts are stored in different locations or used on different aeronautical products.

ADVISORY NOTES

1. *The documents supplied with a part must satisfy the Technical Record requirements established by the Type Certificate Holder for a particular aeronautical product. Particular attention must be paid to life-limited parts. Refer to Part 5, Chapter 5, for additional information regarding the Technical Records procedure for aeronautical products.*

2. *Subject to TAA approval, an organization may choose an alternative means of satisfying this standard, such as filing the conformance documentation separately and utilizing a locally produced tag.*

6. **Packaging.** Replacement parts shall be packaged in a manner that provides adequate protection from damage and deterioration during delivery, handling and storage. Packaging for replacement parts shall:

a. be as specified by the Type Certificate Holder for the aeronautical product on which installation is intended or if not specified in accordance with ATA Specification 300; and

b. identify the source, part number, serial number, lot or batch number (if applicable) and the quantity.

7. **Handling.** Replacement parts shall be handled in an appropriate manner to protect them from damage and deterioration.

ADVISORY NOTE

An organization's material control processes should identify special handling instructions for material such as electronic sensitive device sensitive material, gyroscopes, explosive devices or any other material that requires special handling.

8. **Storage.** The storage area shall assure that aviation parts are adequately protected against environmental damage and deterioration by being properly wrapped, packaged, and boxed. Wherever practical, replacement parts shall be stored in the original packaging. All fluid passages, lines, or electrical connections shall be capped or plugged. Appropriate environmental protection shall be provided for all shelf-life limited parts. The storage area for replacement parts shall be periodically checked for overall effectiveness of storage methods. Batch/lot segregation may be required for parts, which have been identified as flight safety critical aircraft parts such as life-limited parts.

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The system shall include a process for splitting of lots, documentation of such splitting and the recall of all items removed from a particular lot or batch. Parts awaiting documentation, found to be non-conforming and/or awaiting recertification shall be quarantined and segregated from approved parts.

9. **Shelf Life Control.** A system shall be established to adequately identify and control shelf-life-limited parts and materials. Time expired parts and materials shall be segregated and disposed of, in accordance with Part 4, Chapter 1.

10. **Transport.** Replacement parts shall be transported in an appropriate manner in order to protect them from damage and deterioration. If the Type Certificate Holder does not specify special transport requirements, Air Transport Association (ATA) Specification 300, shall be used for the determination of appropriate transport requirements including a shipping container. The parts shall be packed in the container in a manner that will preclude damage from rough handling of the container.

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SECTION 3

ADVISORY MATERIAL (NOT ALLOCATED)

NOTE

In an effort to provide Advisory Material to TAM users as rapidly as possible, all applicable Advisory Material will be published in the form of TAA Advisories, and will be posted on the DTAES websites, which are updated regularly.

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PART 5
AIRWORTHINESS PROCESSES

CHAPTER 3 - MAINTENANCE PROGRAM REQUIREMENTS

SECTION 1

INTRODUCTION

5.3.1.1 Background

1. The maintenance program for an aeronautical product type specifies the maintenance requirements necessary to keep the aeronautical product and associated systems, equipment, component parts and software in a condition that is fit and safe for flight. The identification and development of the maintenance activities for a maintenance program is an important aspect of assuring that the initial airworthiness established during type certification is also maintained during the in-service operation of the aeronautical product. Within the Technical Airworthiness Program, the maintenance requirements for an aeronautical product type are implemented and controlled by the following activities:

a. **Conduct of Maintenance** - inspection, troubleshooting and fault isolation, repair, overhaul, disposal, calibration, testing, conditioning and modification incorporation;

b. **Elementary Work** - simple maintenance tasks that do not affect the airworthiness of an aeronautical product and do not require Maintenance Release Authority (MRA);

c. **Servicing** - cleaning, lubricating, fluid replenishment and ground handling; and

d. **Maintenance Control** - planning, scheduling, quality control, activity control, reporting and configuration management.

2. The goal of an approved maintenance program is to ensure that the minimum essential maintenance is accomplished to assure the continued airworthiness of an aeronautical product during in-service operation. In addition to airworthiness aspects, maintenance requirements for an aeronautical product type may originate from a variety of reasons including availability, mission effectiveness and life expectancy. Furthermore, certain maintenance policies may exist within an organization for standardization, training or other reasons.

5.3.1.2 Maintenance Program Contents and Development

1. **Type Certification.** To determine the airworthiness-related maintenance requirements for an aeronautical product type and how they will be accomplished is a complex undertaking and requires information from the intended user or owner/operator, the manufacturer and/or designer, and the regulatory authorities. As part of the type certification activities, the Instructions for Continued Airworthiness (ICA) are developed and provided by the Design Authorities (DA) for the aeronautical product type. These ICA consist of the maintenance schedules and maintenance instructions as shown in Figure 5-3-1-1. During type certification, the TAA will approve the airworthiness limitations and accept the remainder of the maintenance schedule and its development methodology. For the maintenance instructions portion of the ICA, the TAA will accept them after sampling, review, and correction of discrepancies or after acceptance of an approved completion plan if the maintenance instructions portion of the ICA is incomplete at type certification. The ICA, which comprise of maintenance schedules and maintenance instructions, are then subsequently issued as maintenance manuals as illustrated in Figure 5-3-1-1.

2. **Release to Service.** The aircraft in-service maintenance program consists of a suite of maintenance manuals, which has been defined by ICA received from the DA. As indicated in Figure 5-3-1-1, the ICA are packaged in an approved format, which forms the maintenance program. The contents of the approved maintenance program are detailed in 5.3.2.R1.

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ADVISORY NOTE

Data approval is only granted once, in the official language in which the data was originally written. Translation of approved data does not require an airworthiness approval. It is the Applicant's responsibility to ensure that appropriate translation services are in place, which provide accurate translations of approved data.

5.3.1.3 Maintenance Program Control and Update

1. Following release to service the maintenance program for an aeronautical product type will continue to evolve. Initially, it consists of the manufacturer's recommended maintenance instructions based on design and analysis information determined during development of the aeronautical product and previous experience on similar type designs. As the aeronautical product ages and additional in-service information becomes available, the maintenance program is further refined and optimized for the intended use of the aeronautical product type. Changes to the maintenance program must be controlled by a process that satisfies the airworthiness requirements outlined in 5.3.2.R4.

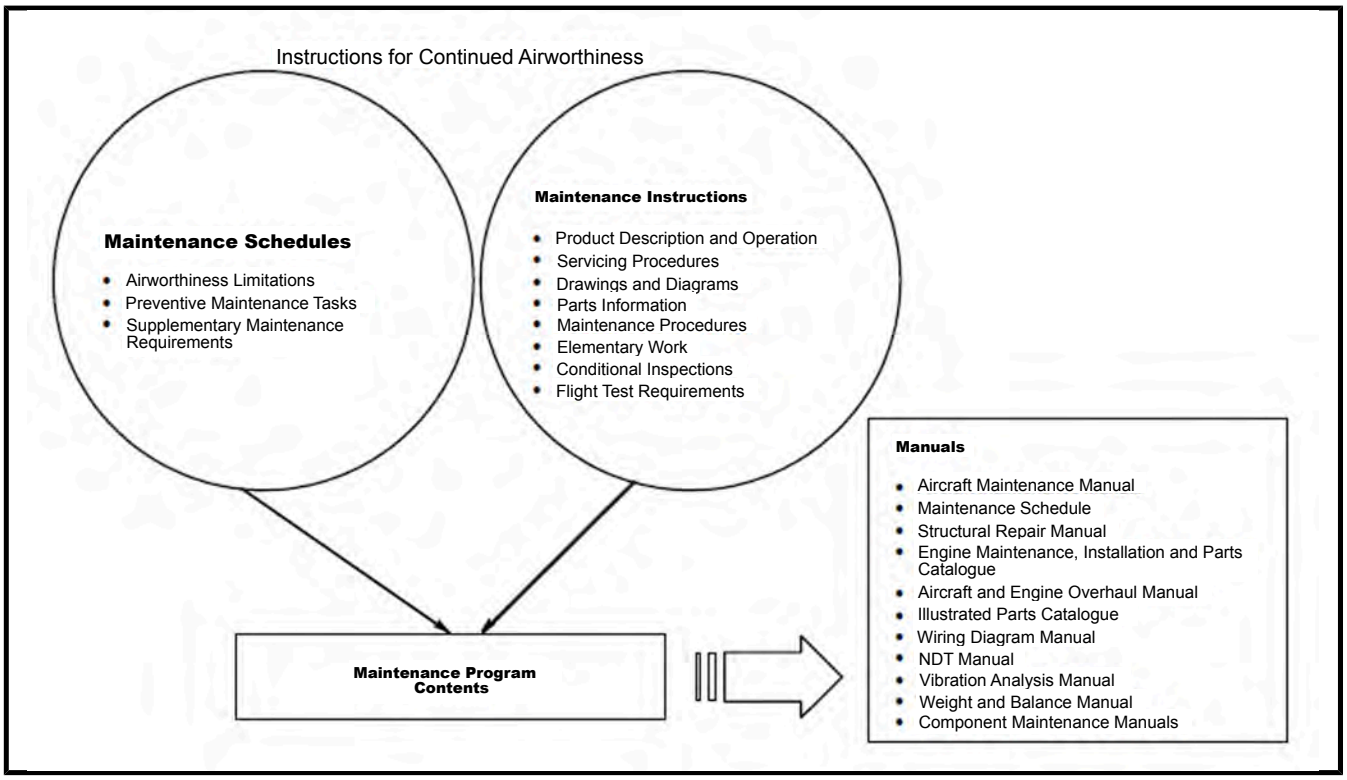

Figure 5-3-1-1 Maintenance Program Contents and Development

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SECTION 2

RULES AND STANDARDS

5.3.2.R1 Maintenance Program Contents

1. An approved maintenance program for an aeronautical product type shall include the contents of the Instructions for Continued Airworthiness (ICA) as specified in 5.3.2.S1.

5.3.2.S1 Maintenance Program Contents

1. **Instructions for Continued Airworthiness (ICA).** An approved maintenance program for an aeronautical product shall include the contents of the ICA as follows:

a. **Maintenance Schedule.** Includes all the scheduled maintenance tasks and intervals required to maintain an acceptable level of aviation safety for the aeronautical product. The maintenance schedule is comprised of the following components:

(1) **Airworthiness Limitations (AWL).** Mandatory maintenance tasks established during the certification of the aeronautical product as an operating limitation of the type certificate. AWLs are approved by the TAA during type certification and must be performed in order for the operator to be in compliance with the type certification requirements. These limitations include:

(a) A listing of life limited components which have mandatory replacement conditions, such as calendar time, flying hours, operating hours, or cycles;

(b) Certification maintenance requirements, which are mandatory inspection tasks, designed to detect latent failures that would result in a hazardous or catastrophic event if occurring in combination with one or more other specific events. These tasks are developed from the system safety analysis; and

(c) Structural integrity/damage tolerance inspections and their associated periodicity, usually expressed as an inspection threshold and repeat value.

ADVISORY NOTES

1. *The ICAs are mandatory requirements of Type Certification as detailed in Part 2, Chapter 1. The OEM is responsible for ICA development in "partnership" with the applicable regulatory authority. The ICA development process commences during the preliminary design stage and involves a number of design, engineering and certification activities leading up to airworthiness approval of the ICA and subsequent issuance of a type certificate for the aeronautical product.*

2. *The maintenance schedules for some military aeronautical products may not include a segregated section listing the tasks that are designated as Airworthiness Limitations. If the safety tasks are not clearly denoted as AWL, an alternate method must be developed which provides a clear distinction between the tasks that are mandatory for aviation safety reasons and those that are manufacturer's recommendations. For military aircraft using the Equipment Codes and Inspection Requirements (ECIR) C-12-XXX-000/NE-000, Part 1, Section 2, Replacement Schedule-lifed Items are considered airworthiness limitations by default and the safety tasks requirement does not apply.*

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(2) **Preventive Maintenance Tasks.** OEM-recommended maintenance tasks and intervals established during the certification of the aeronautical product type. These tasks and intervals are accepted by the TAA during certification and must include a detailed description of the work recommended, degree of inspection and applicable wear tolerances for each part of the aeronautical product and its engines, auxiliary power units, propellers, accessories, instruments and equipment. Reference may be made to a manufacturer's manual for an accessory, instrument or other equipment for this information if it is shown that the item has an exceptionally high degree of complexity requiring specialized maintenance techniques, test equipment or expertise. The recommended inspection intervals and overhaul periods and necessary cross-references to the airworthiness limitations section must also be included.

ADVISORY NOTES

1. *The primary source documentation for preventive maintenance tasks recognized by the TAA, is the Maintenance Review Board Report or equivalent. This report is based on the outcome of Maintenance Steering Group 3 analysis (MSG-3) performed by the OEM during the type certification phase for an aeronautical product. Source documentation such as MSG-3 clearly "tags" each maintenance task with either a safety or mission failure effect category. The MSG-3 processes provide for tasks, such as lubrication, visual inspections, operational or functional checks, and overhaul or replace. This information can be extremely useful to the TCH when making in-service changes to the maintenance program in accordance with 5.3.2.R4.*

   a. *MSG-3 is a task-oriented methodology to derive scheduled maintenance requirements. It provides a standardized format for the analysis and determination of scheduled maintenance tasks for Aircraft Systems/Powerplant, Structures and Zones.*

      (1) Systems/powerplant maintenance requirements are defined by evaluating Maintenance Significant Items (MSIs) functions for failure consequences in terms of safety, operation or economics. According to the consequences, an appropriate preventative maintenance task can be selected.

      (2) Structural maintenance requirements are defined by examining each Structural Significant Item (SSI) for likelihood of Accidental Damage, Environmental Deterioration and Fatigue Damage.

      (3) Zonal requirements are defined by assessing each of the aircraft's zones for accidental damage, operation environment and access. These assessments are summarized with a rating system, which can be converted to an inspection task interval.

   b. *Certification requirements have made it necessary for TCHs to develop ICAs for their respective aircraft's electrical wiring interconnection system (EWIS). FAA Advisory Circular (AC) 25-27A provides guidance for developing maintenance and inspection instructions for EWIS using an enhanced zonal analysis procedure (EZAP). This AC contains information that can be used by operators to improve EWIS maintenance practices.*

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2. *The following are some examples of DND maintenance schedules for an aeronautical product type:*

C-12-XXX (Aerospace Vehicles)
C-14-XXX (Aerospace Engines and Components)
C-13-XXX (Aerospace Components and Accessories)

/DU	*Service/Lubrication Chart*
/NA	*Acceptance/Installation Inspection*
/NC	*Conditioning Inspection/Aircraft Sampling Inspection*
/NE	*Engineering Inspection/Equipment Codes and Inspection Requirements*
/NF	*Planned Inspection Work Cards*
/NM	*Structural Inspection*
/NR	*First Line Inspection*
/NU	*Second Line Inspection*
/NV	*Supplementary Inspection*
/NX	*Third Line Inspection*
/VD	*Corrosion Control Schedule*

(3) **Supplementary Maintenance Requirements.** TAA-directed maintenance checks or inspections that must be performed against the aeronautical product, its systems, and equipment at the specified intervals or times. The supplementary maintenance requirements listed in Annex A shall be developed and incorporated into the maintenance program.

b. **Maintenance Instructions.** A series of maintenance publications developed during the certification of the aeronautical product type. These manuals are accepted by the TAA during certification and shall include the following:

(1) Introductory information that includes an explanation of the aeronautical product's features and data to the extent necessary for prevention and corrective maintenance;

(2) A description of the aeronautical product and its systems and installations including its engines, propellers, and appliances;

(3) Basic control and operation information describing how the aeronautical product's components and systems are controlled and how they operate, including any special procedures and limitations that apply;

(4) Servicing procedures that cover details regarding servicing points, capacities of tanks, reservoirs, types of fluids to use, pressures applicable to the various systems, location of access panels for inspection and servicing, location of lubrication points, lubricants to use, equipment required for servicing, towing instructions and limitations, mooring, jacking and levelling information;

(5) Elementary work list in accordance with 5.3.2.R2;

ADVISORY NOTE

The identification of tasks that can be defined as elementary work is not a mandatory maintenance program requirement. The applicant for initial type certification should decide if the initial maintenance program will include elementary work.

(6) Maintenance procedures including:

(a) Scheduling information in accordance with 5.3.2.S1.1.a;

(b) Corrosion prevention control program;

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(c) Troubleshooting procedures describing probable malfunctions, how to recognize those malfunctions and the remedial action for those malfunctions;

(d) Procedures describing the order and method of removing and replacing aeronautical products and parts with any necessary precautions to be taken;

(e) Procedures describing standard or typical structural repairs;

(f) Other general procedural instructions including procedures for system testing during ground running, symmetry checks, weighing and determining the centre of gravity, lifting and shoring and storage information;

(g) Independent verification requirements for maintenance tasks involving items that are critical to the safety of flight;

ADVISORY NOTE

The conditions for which independent verification would normally be required following maintenance are outlined in 3.1.2.R8.

(h) Maintenance test flight requirements listing the systems and components which, following maintenance, cannot be fully verified as serviceable by inspection or testing on the ground; and

ADVISORY NOTE

The TAA's expectation is that the actual aircrew procedures required to accomplish the maintenance test flight will be included in the aircrew flight manual. Annex A to Part 2, Chapter 7, Section 2, captures this requirement.

(i) Conditional Inspections describing maintenance procedures that shall be carried out following exposure to some hazard or stress (abnormal occurrence) in order to confirm the continued airworthiness of the aeronautical product. Any report or evidence, which suggests that the integrity of the structure, or the performance of the power plant(s), or systems could be impaired due to an abnormal occurrence, shall necessitate a conditional inspection. The maintenance program shall include (but is not limited to) conditional inspections for the following abnormal occurrences:

i. Heavy/Hard and/or overweight landings;

ii. Flight in severe turbulence;

iii. Exceeding of airspeed/acceleration limits;

iv. Burst tire incidents (as applicable);

v. Immersion in water;

vi. Propeller and rotor strikes (as applicable);

vii. Lightning strikes;

viii. High winds or jet blast;

ix. Spillage of corrosive substances;

x. Exposure to volcanic ash;

xi. Ingestion of dry chemical extinguishing agent;

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xii. Over-speed, over-temp and/or over-torque incidents;

xiii. Hail; and

xiv. Bird strikes.

ADVISORY NOTES

1. *In addition to the mandatory inspection requirements, the TCH may choose to additional conditional inspections to address fleet specific concerns (for example, pre-embarkation checks for shipborne helicopters prior to ship deployment).*

2. *The conditional inspection requirements for an aeronautical product are normally developed and incorporated into the ICA during type certification. General guidance with respect to the performance of such inspections can be found in Appendix G of Civil Aviation Regulations (CAR) 625.88.*

(7) Diagrams of structural access plates and information needed to gain access for inspections when access plates are not provided;

(8) Details for the application of special inspection techniques including radiographic and ultrasonic testing where such processes are specified;

(9) Refinishing requirements, such as (but not limited to):

(a) Information needed to apply protective treatments to the structure after inspection; and

(b) Special limitations and/or prohibitions related to coatings, sealants and refinishing processes.

ADVISORY NOTE

Some types of structures (often of composite construction) may require limitations on colour and/or light absorption characteristics due to temperature limitations on the underlying structure. In such cases, these limitations shall be clearly indicated in maintenance program publications, including on paint scheme drawings, describing the required refinishing procedures and processes.

(10) All data relative to structural fasteners, such as identification, discard recommendations and torque values; and

(11) A list of special tools needed.

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ADVISORY NOTES

1. *The following are some examples of DND maintenance manuals for an aeronautical product type:*

   C-12-XXX (Aerospace Vehicles)
   C-14-XXX (Aerospace Engines and Components)
   C-13-XXX (Aerospace Components and Accessories)

/CD	*Third Line Modification Instruction/Permanent Third Line, Recurring Engineering Changes*
/CF	*First and Second Line Modification Instruction/First or Second Line Recurring Engineering Changes*
/DU	*Service/Lubrication Chart*
/DW	*Wiring Diagrams*
/MF	*Description and Maintenance Instructions*
/MN	*Second Line Maintenance Instructions/Corrective Maintenance*
/MY	*Parts List*
/NS	*Special Inspection Instruction*
/TR	*Standard Repair Procedures*

2. *Maintenance programs normally include instructions derived from personnel safety and/or environmental legislation requirements.*

3. *Master Minimum Equipment Lists (MMEL) have not been included in the maintenance program content described in 5.3.2.S1. MMEL have separate rules and standards that regulate their development and amendment that are contained in Part 2, Chapter 6.*

5.3.2.R2 Elementary Work

1. Operational roles and environment will determine whether a TCH chooses to define and utilize elementary work. A TAA-Acceptable Organization may develop an elementary work list and make amendments to the list provided the development or amendment is done in accordance with a TAA-approved Airworthiness Process Manual (APM) for the organization. The TAA-approved elementary work list development and amendment process must meet the standards specified in 5.3.2.S2 and follow 5.3.2.R4, the rule governing changes to the approved maintenance program.

5.3.2.S2 Elementary Work

1. **Development Criteria.** Tasks identified in the elementary work list must be clearly stated, including any limitations deemed appropriate, to ensure that no confusion can result from misinterpretation. The TCH must compare each task against the following criteria to determine whether it can be classified as elementary work:

ADVISORY NOTES

1. *Although formal aviation training, as described in 1.4.2C.3.d(1), is not a mandatory requirement for individuals who perform elementary work, the Senior Maintenance Manager (SMM) in an Acceptable Maintenance Organization (AMO) is responsible for the control of the authorization of personnel to perform elementary work. An AMO's MPM should clearly state the minimum training and qualification requirements for the conduct of elementary work in accordance with 1.4.2C.2.e(1).*

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2. *If a TCH defines first level preventive maintenance inspections, such as A, B, or AB checks as elementary work, using the development criteria, this may be identified in the foreword of the C-12-XXX-000/NE-XXX and/or NR-XXX for the weapon system vice having to produce a formal elementary work list.*

a. **Airworthiness.** Verify that the consequence of an individual's inadequate performance of the task will not impact the airworthiness of an aeronautical product type. Inspections related to Airworthiness Limitations such as life limited components, certification maintenance requirements and structural integrity/damage tolerance tasks for the aeronautical product's systems or structure shall not be classified as elementary work;

b. **Task Complexity.** Verify that the complexity of the task is commensurate with the lower knowledge, skills and experience of the individual(s) that may be authorized to perform the task. Tasks involving the removal/installation of assemblies, the use of special equipment or functional tests requiring the measurement of degradation of the unit's output or functionality shall not be considered as elementary work; and

ADVISORY NOTES

Some examples of possible elementary work are:

a. *Removal and installation of passenger seat belts and harnesses.*

b. *Repairs to upholstery, trim and cabin furnishings.*

c. *Removal, installation or repositioning of non-structural partitions in the passenger cabin.*

d. *Opening and closing of non-structural access panels.*

e. *Removal and replacement of fuses, light bulbs and reflectors.*

f. *Aircraft configuration changes which require the removal and replacement of equipment designed for rapid removal and replacement such as stretchers, litters and seat webbing.*

g. *Repetitive visual inspections and operational checks typically found on first level inspections (that is, "B", "AB" and "A" Check), not involving disassembly or visual aids and performed at cycle intervals of less than 50 AF Hours, provided the tasks are also included in the most frequent scheduled maintenance check (for example, primary or supplementary inspection).*

h. *Removal and replacement of avionics components that are rack mounted or otherwise designed for rapid removal and replacement where work does not require testing other than an operational check. An operational check determines the functioning of a unit but does not involve measuring degradation of the unit's output or functionality.*

i. *Servicing tasks such as replenishment of fluid, lubricating, ground handling, cleaning, etc.*

c. **Added Flexibility.** Verify that there is a benefit associated with making the task part of the fleet approved list of elementary work. Elementary work is not subject to a maintenance release as described in 3.1.2.S10. The less stringent qualification and authorization prerequisite associated with the performance and release of elementary work and servicing is aimed at providing flexibility without compromising safety.

5.3.2.R3 Contingency Aircraft Maintenance Program (CAMP)

1. A TAA-Acceptable Organization may develop a Contingency Aircraft Maintenance Program (CAMP) and make amendments to the CAMP provided the development or amendment is done in accordance with a TAA-approved APM for the organization. The TAA-approved CAMP development and amendment process must meet the standard specified in 5.3.2.S3.1 and follow 5.3.2.R4, the rule governing changes to the approved maintenance program.

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2. In the event that CAMP is invoked, the TCH shall develop a recovery plan in accordance with 5.3.2.S3.2, in order to return the aeronautical product to the level of safety provided by the approved maintenance program.

ADVISORY NOTES

1. *The concept for an aircraft maintenance program is based on a mix of preventive and corrective maintenance procedures that is normally more conservative and balanced than is required during contingency operations. Under such circumstances, there may be a requirement to implement an abbreviated maintenance program in order to provide maintenance authorities and operational commanders sufficient flexibility to respond to rapidly changing circumstances. A Contingency Aircraft Maintenance Program (CAMP) may be developed to meet that requirement.*

2. *The development of abbreviated contingency maintenance schedules derived from the approved scheduled maintenance package (for example, Periodic schedule) is dealt with at 5.3.2.S3.*

3. *An acceptable means of compliance for CAMP development is provided in the DGAEPM AF9000 Plus Work Instruction, EMT04.026-04,* Contingency Aircraft Maintenance Program Development.

4. *An aeronautical product that would not be utilized in a contingency operation would not require the development and implementation of a CAMP.*

5.3.2.S3 Contingency Aircraft Maintenance Program (CAMP)

1. **Contingency Aircraft Maintenance Program (CAMP).** The CAMP shall be developed and incorporated into the maintenance program as follows:

ADVISORY NOTE

The preventive and corrective maintenance requirements under CAMP do not conform to the acceptable level of safety standards associated with the DND/CAF Airworthiness Program. The use of such a contingency program introduces an additional element of risk, which would be unacceptable under normal operations and could temporarily invalidate the aeronautical product type design. Consequently, the use of CAMP is limited to situations of operational necessity as defined in DAOD 2015-1 and governed by the policy detailed in C-05-005-P02/AM-001 for CAMP.

a. **Development Criteria.** The development of the contingency maintenance schedule can be broken down into the following steps:

(1) Identify and list all preventive maintenance inspection tasks being performed on the periodic maintenance schedule;

ADVISORY NOTES

1. *The periodic maintenance schedule is normally the only schedule abbreviated for the CAMP. Scheduled inspections carried out at more frequent intervals, such as the supplementary, daily and first level inspections are not normally abbreviated since they can be performed relatively quickly and there is no appreciable benefit in terms of maintenance downtime savings.*

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2. *Preventive maintenance task can be defined as those tasks that include the following:*

   a. *Lubrication/servicing tasks;*

   b. *Operational/visual tasks;*

   c. *Inspection/functional tasks;*

   d. *Restoration tasks; and*

   e. *Discards.*

3. *Further information on the classification of preventive maintenance tasks can be found in the DGAEPM AF9000 Plus Work Instruction, EMT04.026-04* - Contingency Aircraft Maintenance Program Development.

(2) Identify the safety tasks by reviewing each of the tasks identified in 5.3.2.S3.1.a(1), against the following considerations:

(a) The effect of a failure for which the task is intended to prevent;

(b) Consequences of failures on aircrew, ground support staff, and the local civilian populace;

(c) Detection of degradation of aeronautical product functions by operating crew;

(d) Compensating provisions such as redundant or back-up systems which will reduce the severity of the functional failure; and

(e) Mitigating actions that can be taken by operating crew.

(3) Identify the mission tasks that will be required to support the contingency operation against the following considerations:

(a) Environment of operation;

(b) Mission types and profiles; and

(c) Compensating provisions such as redundant or back-up systems, which will prevent the loss of a mission.

(4) The tasks identified as essential for safety or mission reasons, established in the analysis form the baseline CAMP.

b. **Assessment of Airworthiness Risk.** Prior to each contingency operation, the TCH must review the baseline CAMP developed in accordance with 5.3.2.S3.1.a and identify any safety task that cannot be performed during the given contingency operations due to logistical reasons. In order to support the transition to CAMP, from the normal Maintenance Program, the TCH shall perform a risk assessment in accordance with Part 5, Chapter 1, on any safety task being removed.

ADVISORY NOTE

Examples of logistical reasons that may make the completion of some baseline CAMP tasks unreasonable are; complex tasks requiring the use of special equipment or procedures that result in unacceptable downtime, or physical space considerations that come into play on board a ship. The risk assessment process can be used by the SDE (WSM/AEO) to manage the risk based on unique contingency maintenance requirements.

2. **Recovery Plan.** Upon completion of a contingency operation and, prior to returning to routine operations, the TCH shall develop, approve and implement a recovery plan to ensure that the aeronautical product(s) is returned

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to the pre-CAMP levels of safety afforded by the approved maintenance program; as a minimum, the recovery plan shall ensure that:

a. An inspection is carried out to establish the operational impact (abnormal damage) on each affected aeronautical product with respect to the operational usage and environmental conditions.

b. All maintenance requirements that were eliminated, postponed and/or modified are carried out to the extent necessary to return the aeronautical product to the pre-contingency operation levels of safety.

c. A schedule is established that will return the affected aircraft to a pre-contingency operation condition in a timely manner. This will minimize the risk of resuming routine operations with aircraft that may not meet the required levels of safety.

5.3.2.R4 Changes to the Approved Maintenance Program

1. A TAA-Acceptable Organization may make and approve changes to the content of the approved maintenance program provided the changes are done in accordance with a TAA-approved APM for the organization. The TAA-approved process for changes to the approved maintenance program must meet the standard specified in 5.3.2.S4.

ADVISORY NOTES

1. *Changes to NDT techniques constitute a maintenance program design change and should, therefore, be processed through an acceptable maintenance program change process. See TAA Advisory 2006-06 for additional details on the development and approval of NDT techniques for DND type certificated aircraft.*

2. *Changes to a Master Minimum Equipment List (MMEL) have not been included in 5.3.2.R4, since the MMEL has separate rules and standards that regulate its development and amendment. A TAA-Acceptable Organization that intends to develop or modify an existing MMEL must comply with Part 2, Chapter 6.*

3. *There are provisions in the airworthiness program for deviations to the approved maintenance program. 3.1.2.S1.2 provides an appropriate standard for an organization to follow when deviating from the approved maintenance program.*

4. *Deviations from the approved maintenance program that involve Airworthiness Limitations (AWLs), as described in 5.3.2.S1.1.a(1), would not be considered appropriate for normal operations. However, the TAA recognizes that there may be circumstances that require an AWL deviation. In these cases, the deviation request involving the AWL will be subject to a risk assessment in accordance with Part 5, Chapter 1. Regardless of the risk level assigned (ALOS or higher), the TCH will notify the TAA (DTAES staff) when this action is taken and the reason it was required.*

5.3.2.S4 Changes to the Approved Maintenance Program

1. The TAA-approved process shall ensure that the following categories of changes to the approved maintenance program are submitted to the TAA for approval:

a. Airworthiness Limitations described in 5.3.2.S1.1.a(1), that satisfy the design change certification requirements specified in Part 3, Chapter 2;

ADVISORY NOTE

The maintenance schedules for some military aeronautical products may not include safety tasks denoted as airworthiness limitations. For these aircraft types, CFTO C-12-XXX-000/ NE-000 Part 1, Section 2, Replacement Schedules - Lifed Items, and Part 1, Section 3 - Out of Sequence Inspection, are considered airworthiness limitations.

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b. Extensive changes to maintenance schedule format or structure; and

ADVISORY NOTE

Changes resulting from trade restructuring, large-scale modifications (for example, AUP updates) and conversions to electronic formats, as well as changes resulting from the use of source documentation that is different from the source documentation used to develop the maintenance schedules would all be considered extensive.

c. Changes resulting from changes to the aeronautical product role, mission or usage spectrum.

2. All changes to the approved maintenance program shall be conducted using a design change process, which adequately addresses the following:

ADVISORY NOTE

From a technical airworthiness perspective, changes to the approved maintenance program are defined as design changes. Any change to an approved maintenance program, meeting the requirements of this standard, will fully satisfy the design change certification requirements governed in the TAM Part 3, Chapter 2.

a. **Maintenance Program Design Change Categorization.** Each change must be assessed to determine the impact of the change on the airworthiness of the aeronautical product type. The Maintenance Program Design Change Categorization must classify each change as either minor or major, in accordance with the following criteria;

(1) **Major.** Changes affecting the maintenance instructions and schedules for systems, structures and/or powerplants that may potentially have more than a negligible effect on airworthiness. The following amendments would normally be considered to be major program design changes;

(a) **Maintenance Schedules**

i. Maintenance program changes described in 5.3.2.S4.1;

ii. Safety related tasks;

ADVISORY NOTE

Maintenance Steering Group 3 (MSG3) or other variations of reliability centred maintenance analysis may aid in the identifications of safety related tasks. For the purposes of this chapter, safety tasks are defined as those tasks that are required to ensure continued safe flight and landing of the aircraft and to prevent serious or fatal injury to the operating crew.

iii. Supplementary maintenance requirements in accordance with 5.3.2.S1.1.a(3);

iv. CAMP in accordance with 5.3.2.R3;

v. Elementary task lists in accordance with 5.3.2.R2; and

vi. Conditional inspections.

(b) **Maintenance Instructions**

i. Procedural changes for safety and flight critical systems.

ii. Extensive changes such as repackaging or conversion to Interactive Electronic Technical Manuals (IETM).

iii. Changes to the illustrated parts catalogue that involve new part numbers.

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ADVISORY NOTES

1. *DND "MY" maintenance manuals are accepted by the TAA as a suitable Illustrated Parts Catalogue.*

2. *There are occasions where organizations performing maintenance require SDE (WSM/AEO) guidance and approval for part substitution. The rules and standards for parts substitution can be found in 3.1.2.R7. If the intent is to permanently amend the illustrated parts catalogue or the MY then the SDE (WSM/AEO) should follow the TAA-approved process for changes to the approved maintenance program.*

3. *When making permanent changes to the illustrated parts catalogue or the MY or approving a parts substitution, the SDE (WSM/AEO) must ensure that the change is assessed correctly. Part number changes or parts substitution may result in a Maintenance Program Design Change Categorization of minor if:*

   a. *the form, fit and function characteristics of the new part are identical to that which it is replacing;*

   b. *the specifications for the two items have minimal variations;*

   c. *the aeronautical product on which the part will be installed does not require modification; and*

   d. *there is no requirement to adjust maintenance procedures and/or the maintenance schedule to accommodate the new part number.*

iv. New structural repair schemes or modifications to existing approved repairs.

ADVISORY NOTE

New structural repair schemes may be captured in a structural repair manual and often changes to repair schemes are submitted to the SDE (WSM/AEO) as non-standard repairs. When dealing with new repair schemes, modifications to existing repair schemes, and non- standard repairs the SDE (WSM/AEO) will need to ensure the rules and standards for design change certification in Part 3, Chapter 2, have been met. This is due to the engineering complexity and unique specialty engineering activity that may require an airworthiness approval from a specialist engineer.

v. Changes to system/structural operating parameters or specifications.

ADVISORY NOTE

The list of changes identified that may be considered major is not intended to be exhaustive. The process used by the TCH needs to review all planned changes to determine if there is a potential for an impact on airworthiness. Given that the maintenance program encompasses all maintenance requirements necessary to keep an aeronautical product and associated systems, equipment, component parts and software in a condition that is fit and safe for flight, the TCH should assess all possible impacts from a proposed change when performing the Maintenance Program Design Change Categorization.

(2) **Minor.** Changes affecting the maintenance instructions and schedules for systems, structures and/or powerplants that do not have more than a negligible effect on airworthiness and have not been deemed major in accordance with the above criteria.

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ADVISORY NOTE

Changes related to personal safety of ground crew and the environment do not have an impact on airworthiness. Nevertheless, it is the responsibility of the TCH to ensure that changes of this nature are fully reviewed and that the final product is suitable for its intended purpose.

b. **Verification.** Changes must be verified for compliance with the airworthiness regulations and standards listed in the basis for certification. Additionally, this process must verify that the information being changed is accurate, safe in application and suitable for its intended purpose. A verification of major changes, normally involves a detailed analysis. Comparison of similar applications, analysis of flight safety and maintenance repair data, consultation with original equipment manufacturers (OEM) or other specialist organizations and the application of industry standard logics and methodologies are all means of collecting the substantiating evidence required for airworthiness certification.

ADVISORY NOTES

1. *The verification process for maintenance schedule changes should also include steps to identify and confirm compliance with applicable airworthiness design standards. These standards can be found in the DND* Airworthiness Design Standards Manual (ADSM), *equivalent civil regulatory manuals (for example, CAR, FAR and EASA), industry standard manuals (for example, SAE, ATA) or other suitable legacy standards. An example of an applicable legacy standard is D-05-001-001/SF-000 -* Age Control of Elastomeric Materials in Aerospace Systems*. This standard would apply to changes to the approved maintenance program that involve elastomeric materials.*

2. *Often there will be changes required to the approved maintenance program that result from in-service information. In these cases it may not be possible to link a change to an appropriate design standard. An example of this might be a recommendation for an improvement to a special tool used in a maintenance procedure. The TCH can assess the recommended change to determine if the new tool design will function as required and determine if the tool modification is deemed to be a major change.*

3. *In some cases, an in-service validation of a change may be required to ensure that it has met the appropriate standards and operational demands for which it was intended. This may include a maintenance evaluation trial for a new procedure.*

4. *For the older DND fleets, the maintenance manual and schedule source data is not always available. For maintenance schedules, MSG-3 analysis and FMEA analysis can be used to aid in the identification of hazardous situations and the development of applicable and effective inspection tasks.*

c. **Airworthiness Re-assessment.** All changes must be re-assessed following the development of the solution to ascertain that the impact on airworthiness has not changed.

d. **Airworthiness Approval.** A competent, authorized individual, who has been assigned the required scope and depth of airworthiness authority, may approve changes assessed as having a major impact on airworthiness.

ADVISORY NOTES

1. *Changes that do not have a major impact on airworthiness do not require airworthiness approval.*

2. *Airworthiness approval by a competent "authorized individual" does not include the changes to the approved maintenance program listed in 5.3.2.S4.1, which require TAA approval.*

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3. *The scope and depth of authority assigned to an "authorized individual" will depend upon the knowledge, skills and experience of the individual and the scope and depth of airworthiness authority assigned to the SDE (WSM/AEO).*

e. **Technical Airworthiness Clearance (TAC).** TAC shall be granted for all changes to the Approved Maintenance Program.

f. **Documentation and Archiving.** All documentation, including evidence supporting a design change form part of the type record for the aeronautical product and must be retained in accordance with Part 5, Chapter 5.

ADVISORY NOTES

1. *The minimum documentation required to support a change to the approved maintenance program would normally contain the following*

   a. *A clear identification of the affected item(s);*

   b. *A clear description of the change(s);*

   c. *Justification for change(s) with all referenced/relevant supporting technical data attached. This may include but is not limited to; OEM correspondence, technical analysis reports, service bulletins, Airworthiness Directives (AD), reliability monitoring data, and MSG-3 analysis; and*

   d. *Copies of all affected pages of the maintenance publications identifying old and new content. Before and after change(s) are included in the documentation requirements in order to maintain a history of all changes made to the approved maintenance program.*

2. *Data approval is only granted once, in the official language in which the data was originally written. Translation of approved data does not require an airworthiness approval. It is the responsibility of the Type Certificate Holder to ensure that appropriate translation services are in place that provide accurate translations of approved data.*

5.3.2.R5 Transfer of Aeronautical Products Between Maintenance Programs

1. A TAA-Acceptable Organization may transfer aeronautical products between maintenance programs provided the transfer is done in accordance with a TAA-approved process manual for the organization. The TAA-approved airworthiness process must meet the standards specified in 5.3.2.S5.

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ADVISORY NOTES

1. *The transfer of aeronautical products between maintenance programs occurs when:*

   a. *an airworthy part maintained under the approved maintenance program for an aeronautical product is removed for reinstallation as an approved part on another aeronautical product which has a different approved maintenance program; and*

   b. *a used aeronautical product which is borrowed or bought and its intended use involves the application of a different approved maintenance program.*

2. *Aeronautical products that are used parts as defined in Part 5, Chapter 2 and meet the standards in 5.2.2.S1, are still subject to the provisions of 5.3.2.R5 if the intended use involves the application of a different approved maintenance program.*

3. *These rules should be read in conjunction with the rules on the installation of parts. Refer to Part 3, Chapter 1.*

4. *Aeronautical products removed from a damaged or crashed aircraft or a component that may have been involved in an abnormal occurrence are not considered airworthy for transfer between maintenance programs unless the component has been recertified in accordance with 5.2.2.R2.*

5. *These rules do not apply to the robbing of parts within a TAA-Acceptable Maintenance Organization where the part is removed from and installed on aircraft with the same type certificate and maintenance program. The rules applicable to robbing of parts are detailed in 3.1.2.R6.*

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6. *These rules do not apply to the "borrowing of parts". The rules applicable to borrowing of parts are detailed in 3.1.2.R12.*

7. *These rules do not apply to the transfer between a normal and contingency aircraft maintenance program (CAMP) as described in 5.3.2.R3. The procedures for this type of transfer may be included in the approved CAMP for a specific aircraft type.*

5.3.2.S5 Transfer of Aeronautical Products Between Maintenance Programs

1. To transfer an aeronautical product between maintenance programs, the new maintenance program for the aeronautical product must account for the maintenance program under which the aeronautical product was previously maintained. This must include an engineering review covering:

a. the transferred aeronautical product conforms to the TAA-approved type design for the aircraft;

ADVISORY NOTE

This review is required to ensure that the configuration status for the transferred aeronautical products is identical to the current acceptable configuration maintained for the aircraft type. Care should be taken to ensure that the transferred aeronautical products' form, fit and function characteristics are identical.

b. the existence of acceptable evidence of conformance to the approved type design as specified in 5.2.2.S1.2.b(1);

c. the history of the aeronautical product sufficient to establish the life usage and/or installation time accumulated up to the time of transfer and maintenance history as specified in 5.2.2.S1.2.b(2);

ADVISORY NOTE

This will only be applicable for transferred aeronautical products that have an associated life or maintenance inspection requirement(s) listed in a maintenance schedule. This may be expressed in calendar time, flying hours, operating hours, or cycles.

d. A review of the environment and usage spectrum under which the aeronautical product was operated for similarity to the new usage spectrum and environment;

e. The assignment of an appropriate inspection interval to transfer the aeronautical product to the approved maintenance program. This may require establishing new intervals or life limits and must be done in a manner that ensures the original life limits assigned to the aeronautical product under its old maintenance program are not over flown;

ADVISORY NOTE

Transport Canada Airworthiness Manual Advisory (AMA) 571.105 provides guidelines on how to calculate appropriate inspection intervals. DTAES may also be consulted on how to perform these types of calculations.

f. Establishing any special maintenance tasks required to be performed on the transferred aeronautical product to ensure that all required maintenance under its old maintenance program is adhered to; and

g. At the time of transfer, the user of the part shall make entries in the appropriate sections of the Technical Record in accordance with 5.3.2.S5.2.

2. At the time of transfer, appropriate entries shall be placed into the Technical Record for transferred or borrowed aeronautical products and shall include:

a. the source of the aeronautical product including acceptable evidence of conformance to the approved type design as per 3.1.2.S4.2;

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b. historical information as necessary, such as accumulated operating hours, landings, gun firings or calendar time accumulated prior to transfer. These entries must be expressed as time since overhaul or time since new;

c. all inspection requirements determined in accordance with 5.3.2.S5.1.e and 5.3.2.S5.1.f; and

d. any limits remaining on the aeronautical product.

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ANNEX A

SUPPLEMENTARY MAINTENANCE REQUIREMENTS

1. These are TAA-directed maintenance tasks or inspections on an aeronautical product and the associated systems, equipment and components that must be accomplished at the specified interval or time.

ADVISORY NOTE

This supplementary maintenance requirements listed in this Annex have been derived from Appendix C - Out of Phase Tasks and Equipment Maintenance Requirements detailed of Canadian Aviation Regulations (CAR) 625.

a. **Aircraft Used in Dual-role Operations.** Upon conversion between roles, inspect to ensure that contamination, structural damage and other defects incurred during operation in the special purpose role is rectified prior to operation in the normal role.

b. **Weight and Balance.** All aircraft shall be re-weighed in accordance with the procedures in the applicable maintenance manual and an updated weight and balance report prepared, in accordance with 5.5.2.R2, at least every 5 years.

ADVISORY NOTE

The Type Certificate Holder (TCH) may, with TAA approval, define an alternate weight and balance re-weighing frequency that is appropriate for the particular fleet.

c. **Non-stabilized Magnetic Direction Indicators (MDI)**

(1) Except as provided in 5.3.2A.1.c(2) and 5.3.2A.1.c(3), non-stabilized MDI shall be calibrated, and a dated correction card installed for each indicator, at intervals not exceeding 12 months;

(2) The annual calibration requirement of 5.3.2A.1.c(1) does not apply to any large or turbine-powered pressurized aircraft, where:

(a) the aircraft is equipped with two independent stabilized MDI in addition to the non-stabilized direct reading MDI; and

(b) a procedure for monitoring and recording the performance of the MDI is detailed in the approved maintenance control manual approved in accordance with 1.4.2B.

(3) The calibration requirement of 5.3.2A.1.c(1) can be postponed, for the purpose of flights commencing or terminating within the compass unreliability area, as defined in the Designated Airspace Handbook (TP 1820), or any of a series of flights conducted within a period of seven consecutive days, where the series commences within the area of compass unreliability.

d. **Emergency Locator Transmitters (ELT).** ELT in-service maintenance requirements shall be carried out in accordance with the Airworthiness Design Standards Manual (ADSM) Part 4, Section F, Chapter 13.

e. **Altimetry Devices.** Sensitive altimeters, pitot and static pressure systems and other altimetry devices, where installed for compliance with the Certification Basis listed on the type certificate, or where required by operating rule, shall be inspected and calibrated at intervals not exceeding 24 months, in accordance with Transport Canada Airworthiness Manual Chapter 571, Appendix B.

ADVISORY NOTE

For the purposes of this section, the term "other altimetry devices" includes any air data computer, or other barometric device, providing a flight crew station, or an auto pilot, or automatic pressure altitude reporting system with altitude data derived from static pressure.

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f. **Air Traffic Control (ATC) Transponders.** ATC transponders, including any associated altitude sensing reporting mechanisms, where installed, shall be tested every 24 calendar months.

g. **Cockpit Voice Recorders (CVR).** CVR in-service maintenance requirements shall be carried out in accordance with the ADSM Part 4, Section F, Chapter 13.

h. **Underwater Locating Devices (ULD).** ULD in-service maintenance requirements shall be carried out in accordance with the ADSM Part 4, Section F, Chapter 13.

i. **Flight Data Recorders (FDR).** FDR in-service maintenance requirements shall be carried out in accordance with the ADSM Part 4, Section F, Chapter 13.

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SECTION 3

ADVISORY MATERIAL (NOT ALLOCATED)

NOTE

In an effort to provide Advisory Material to TAM users as rapidly as possible, all applicable Advisory Material will be published in the form of TAA Advisories, and will be posted on the DTAES websites, which are updated regularly.

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PART 5
AIRWORTHINESS PROCESSES

CHAPTER 4 - MANUFACTURE OF AERONAUTICAL PRODUCTS AND AVIATION REPLACEMENT PARTS

SECTION 1

INTRODUCTION

5.4.1.1 Background

1. The manufacturing of aeronautical products and aviation replacement parts intended for installation on an aeronautical product plays an important role in achieving an acceptable level of aviation safety for military aviation.

> *"The inherent safety of an aircraft is a function of its design integrity and the quality of its manufacturing and maintenance programs."*
>
> *-FAA Certification Service*

An aeronautical product can only be considered airworthy if all equipment, appliances and associated components were manufactured in conformance with the applicable approved type design. Therefore, the manufacture of aeronautical products and aviation replacement parts are controlled within the technical airworthiness program in the following manner:

a. all aeronautical products and aviation replacement parts must be manufactured by organizations acceptable to the TAA;

b. a manufacturer of aeronautical products or aviation replacement parts must establish a manufacturing control system throughout the manufacturing process to assure the airworthiness of finished products; and

c. all newly manufactured aeronautical products and aviation replacement parts must be certified as in conformance with the applicable approved type design and in a condition for safe operation.

2. **Acceptable Manufacturers.** Manufacturers of aeronautical products and aviation replacement parts acceptable to the TAA must have the organization, plant facilities, technical data, production capability, inspection equipment, and competent personnel necessary to manufacture and inspect the particular product or part in accordance with the applicable approved type design. Furthermore, an acceptable manufacturer must have implemented a quality management system throughout all aspects of the manufacturing process. The quality management system must provide for the control of the quality of all manufacturing operations and also be capable of ensuring that each aeronautical product or aviation replacement part conforms to the applicable technical data in the approved type design. Manufacturers acceptable to the TAA are defined in detail in 5.4.2.S1, and include:

a. a TAA-Acceptable Manufacturing Organization;

b. a TAA-Acceptable Maintenance Organization if the part is for immediate use during the maintenance or modification of an aeronautical product; and

c. a manufacturing organization recognized by the TAA including:

(1) the original equipment manufacturer (OEM) for an aeronautical product for which a type certificate has been issued;

(2) an organization that has a licensing agreement, including manufacturing rights from an OEM; and

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(3) the OEM for a prime part numbered item in the approved type design of an aeronautical product.

3. **Manufacturing Control System.** The purpose of the manufacturing control system is to ensure that all aeronautical products and aviation replacement parts produced by a manufacturer are in conformance with the technical data for the applicable approved type design. To achieve this objective, a manufacturing control system must include processes for the control of the following:

a. production;

b. conformity inspection;

c. suppliers and vendors;

d. raw materials; and

e. tools and equipment calibration.

4. **Manufacturing Product Conformance.** An airworthiness certification of manufacturing product conformance is required for all newly manufactured aeronautical products as a technical airworthiness function performed on behalf of the TAA. Manufacturing product conformance certifies that a newly manufactured aeronautical product or aviation replacement part has been manufactured in conformance with the applicable approved type design and is in a condition for safe operation. Manufacturing product conformance is normally documented on a Certificate of Conformance signed by an authorized individual within a manufacturing organization acceptable to the TAA.

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SECTION 2

RULES AND STANDARDS

5.4.2.R1 Aeronautical Product Manufacture

1. Subject to 5.4.2.R1.2, an aeronautical product, including aviation replacement parts, intended for installation on an aeronautical product for which the TAA has issued or intends to issue a DND type certificate shall be manufactured:

   a. by an organization acceptable to the TAA;

   b. in accordance with the approved type design for the aeronautical product; and

   c. in accordance with the manufacturing control system of the organization.

2. The TCH may authorize deviations or waivers from the requirements of the approved type design when:

   a. an organization submits a request to the TCH; and

   b. it is demonstrated that the deviation or waiver will not affect airworthiness.

ADVISORY NOTE

A deviation or waiver to an approved type design would normally be authorized by an individual who has been assigned the scope and depth of technical airworthiness authority by the TAA, which includes the airworthiness approval of the design change. This may include the designated Design Authority and Type Certificate Holder for the aeronautical product approved type design as described in Part 1, Chapter 4.

5.4.2.S1 Aeronautical Product Manufacture

1. **Acceptable Manufacturers.** Organizations acceptable to the TAA for the manufacturers of aeronautical products, except as provided in 5.4.2.S1.2 and 5.4.2.S1.3, for standard and commercial parts respectively, are:

ADVISORY NOTE

Aviation replacement parts manufactured by an organization that cannot be classified as acceptable to the TAA, in accordance with 5.4.2.S1, must be formally introduced into the approved type design as a design change, in accordance with Part 3, Chapter 2. Once the applicable technical data has received the required airworthiness approval and Technical Airworthiness Clearance (TAC), the appropriate maintenance manuals, configuration management documentation, and logistic support information can be updated to permit use of the parts in service.

   a. a TAA-Acceptable Manufacturing Organization (AMfgO), in accordance with 1.4.2.R1;

   b. a TAA-Acceptable Maintenance Organization (AMO), in accordance with 1.4.2.R1, provided that:

      (1) the manufacture of the aeronautical product is either authorized as local manufacture in the applicable maintenance manual or included in the scope of the AMO;

      (2) all applicable technical data is current and available including drawings, material specifications, process specifications and inspection requirements to assure manufacture in conformance with the applicable approved type design;

      (3) the AMO's manufacturing process and quality management system adequately addresses the manufacturing control system requirements of 5.4.2.S1.4; and

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(4) the part is only intended for immediate use on an aeronautical product currently in the control and custody of the AMO.

c. a manufacturing organization recognized by the TAA, in accordance with 1.4.2.R1. Organizations recognized by the TAA for the manufacture of aeronautical products include:

(1) the original equipment manufacturer (OEM), as described in 1.4.1.3.6.b, for an aeronautical product for which the TAA has issued or intends to issue a DND Type Certificate;

(2) the original equipment manufacturer (OEM), as described in 1.4.1.3.6.b, for a part which is listed as a prime part number in the approved type design for an aeronautical product for which the TAA has issued or intends to issue a DND Type Certificate;

ADVISORY NOTE

Any alteration to a part number in an approved type design (i.e. use of a propriety number or addition of a prefix or suffix) normally indicates that additional requirements exist regarding the manufacture or use of the part. These additional requirements may have been introduced either during design approval of the aeronautical product or by a subsequent approved design change. Therefore, additional information must be obtained from the organization that altered the part number in the approved type design prior to manufacture of the part. The additional requirements may involve:

a. *modification of the part during manufacture or prior to use;*

b. *specific tolerances to be applied to the part; and*

c. *increased inspection and/or testing of the part.*

(3) a manufacturing organization approved by a regulatory agency recognized by the TAA for the manufacture of the aeronautical product; and

ADVISORY NOTE

Manufacturing organizations accredited by another regulatory organization and recognized by the TAA include:

a. *a manufacturer who has been given FAA Parts Manufacturing Approval (PMA) for a part listed on the approved type design for an aeronautical product for which the TAA has issued or intends to issue a DND Type Certificate provided the applicability of the PMA part is assessed by the Type Certificate Holder for the aeronautical product; and*

b. *a manufacturer who has been given Technical Standard Order (TSO) authority by Transport Canada (TC) or US FAA for an appliance or part which is listed as a TSO appliance or part on the approved type design for an aeronautical product for which the TAA has issued or intends to issue a DND Type Certificate.*

(4) a company which has a licensing agreement including manufacturing rights from an aeronautical product OEM specified in 5.4.2.S1.1.c(1).

ADVISORY NOTE

The company requires access to all applicable technical data including drawings, material specifications, process specifications and inspection requirements to assure manufacture in conformance with the approved type design of the aeronautical product. This should include an arrangement whereby the OEM will provide updates to the technical data resulting from the incorporation of design changes to the approved type design that affects the continuing airworthiness of the aeronautical product.

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2. **Standard Part Acceptable Manufacturer.** Any organization may be acceptable for the manufacture of standard parts provided that:

a. the organization has the applicable specification;

b. the organization is capable of manufacturing the part in conformance with the applicable specification;

c. the organization is capable of providing proof of conformance; and

d. the quality of the manufactured part is controlled in the purchase order, contract or tasking directive in accordance with Part 5, Chapter 2.

ADVISORY NOTES

1. *Standard parts are defined in 5.2.1.1 as parts that are manufactured in conformance with a specification established, published and maintained by a consensus standards organization or government agency that includes design, manufacturing, test and acceptance criteria and identification requirements. Standard parts are generally common hardware parts produced to recognized industry or government specifications which are available without proprietary limitations, such as SAE, NAS, AN, and MS hardware items.*

2. *A standard part may be used on an aeronautical product when the part number is included without alteration in the approved type design for the aeronautical product.*

3. *Any alteration to a part number in an approved type design (i.e., use of a proprietary number or addition of a prefix or suffix) normally indicates that additional requirements exist regarding the manufacture or use of the part. These additional requirements may have been introduced either during design approval of the aeronautical product or by a subsequent approved design change. Therefore, additional information must be obtained from the organization that altered the part number in the approved type design prior to manufacture of the part. The additional requirements may involve:*

   a. *modification of the part during manufacture or prior to use;*

   b. *specific tolerances to be applied to the part; and*

   c. *increased inspection and/or testing of the part.*

3. **Commercial Part Acceptable Manufacturer.** Any organization may be acceptable for the manufacture of commercial parts provided that:

a. the organization has the applicable technical data;

b. the organization is capable of manufacturing the part in conformance with the applicable technical data;

c. the organization is capable of providing proof of conformance; and

d. the quality of the manufactured part is controlled in the purchase order, contract or tasking directive in accordance with Part 5, Chapter 2.

ADVISORY NOTES

1. *A commercial part is defined in 5.2.1.1, as a part not specifically designed or produced for application in aviation but its use on an aeronautical product is authorized in the approved type design for the aeronautical product. A commercial part is manufactured to a specification or catalogue description and marked under the scheme of the commercial part manufacturer. Commercial parts are generally common non-aeronautical parts available on the commercial market. Examples include some oil filters, pumps, valves, generators and voltage regulators, designed and manufactured for the automobile industry.*

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2. *A commercial part is generally used in the approved type design of an aeronautical product where the failure of the part will not adversely affect the continued safe flight and landing of an aircraft. A commercial part may be used on an aeronautical product when the part number is included without alteration in the approved type design for the aeronautical product.*

3. *Any alteration to a part number in an approved type design (i.e. use of a proprietary number or addition of a prefix or suffix) normally indicates that additional requirements exist regarding the manufacture or use of the part. These additional requirements may have been introduced either during design approval of the aeronautical product or by a subsequent approved design change. Therefore, additional information must be obtained from the organization that altered the part number in the approved type design prior to manufacture of the part. The additional requirements may involve:*

   a. *modification of the part during manufacture or prior to use;*

   b. *specific tolerances to be applied to the part; and*

   c. *increased inspection and/or testing of the part.*

4. **Manufacturing Control System.** The manufacturing control system shall include:

   a. Production controls to ensure that all manufacturing tasks are performed by authorized personnel, in accordance with documented organization procedures and work instructions to assure conformance with the applicable technical data;

   b. Conformity inspection system that encompasses all phases of production, including material receiving, in-process and final product inspection and testing. The conformity inspection system shall:

      (1) establish where, throughout the manufacturing cycle, inspections and tests are performed including those required at external organizations such as a supplier or vendor facility;

      (2) identify the nature of the inspection to be performed and provide the appropriate procedures and criteria at each phase of inspection;

      (3) establish final inspection procedures for the completed product or part, including:

         (a) for aircraft, the manufacturer's flight test procedures and checklist; and

         (b) for engines and propellers, the manufacturer's final operational check procedures and checklist.

      (4) establish procedures for recording, filing and retention of inspection results.

   c. a process for the control of suppliers and vendors including a method for:

      (1) evaluating or rating of organizations; and

      (2) application of quality management system requirements including audits.

   d. a material control process including:

      (1) incoming inspection of materials and supplies and associated documentation, including procedures for the filing and retention of necessary documentation;

      (2) storage and handling of materials and supplies; and

      (3) non-conforming products and material procedures, including segregation, disposition review and disposal.

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e. tool and equipment control procedures to ensure the necessary checks and calibrations are accomplished at established periods using referenced standards including traceability to national or international standards as required.

5.4.2.R2 Performance of Manufacture

1. A person who performs a manufacturing task, including required inspections on an aeronautical product shall ensure that the procedures, parts, and materials employed are as specified by:

a. the applicable technical data in the approved type design for the aeronautical product; or

b. the processes in the manufacturing control system for the organization.

5.4.2.S2 Performance of Manufacture

1. The applicable technical data in the approved type design as described in 2.1.2.S1.12, provides the information regarding dimensions, materials, manufacturing processes and inspection requirements necessary to manufacture an aeronautical product in conformance with the approved type design. The applicable technical data includes:

a. the drawings and specifications and a listing of those drawings and specifications necessary to define the dimensions, materials, parts and assembly of the product;

b. the manufacturing process specification; and

c. the inspection and testing requirements.

2. The manufacturing control system for the organization provides the production procedures or work instructions and inspection procedures including the approved methods, techniques, practices, tools, equipment, measuring device, test equipment and test apparatus.

5.4.2.R3 Material Substitution

1. Substitute materials acceptable to the TAA may be used in the manufacture of an aeronautical product.

ADVISORY NOTE

Material substitution involves the use of a material with suitable characteristics to replace the one listed in the approved type design for an aeronautical product but is not specified as an authorized alternative. The substitution process applies when the two materials are interchangeable without a change to the approved type design (e.g. change to the approved maintenance program, modification of the part or the aeronautical product on which it will be installed). Material substitution is a one-time use of the replacement material. Any situation which requires either a modification to use the proposed substitute material, a change in the maintenance schedule/procedures or ongoing use of the proposed substitute material will require a formal design change. Refer to Part 3, Chapter 2.

5.4.2.S3 Material Substitution

1. Substitute materials shall be considered acceptable to the TAA provided they meet the following criteria:

a. the form, fit and function characteristics of the manufactured aeronautical product is not altered or is similar but suitable;

b. the specifications for the two materials have minimal variations;

c. the substitute was selected by an authorized individual using the approved procedures of an organization acceptable to the TAA; and

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d. the airworthiness category of the substitution has been assessed as minor by an authorized individual using the approved procedures of an organization acceptable to the TAA.

5.4.2.R4 Product Identification

1. Any newly manufactured aeronautical product, including aviation replacement parts intended for installation on an aeronautical product, shall be identified in accordance with Part 5, Chapter 8.

ADVISORY NOTE

Aeronautical products are identified or marked, in accordance with Part 5, Chapter 8, to provide control and traceability during procurement, manufacture, installation and maintenance. The content and form of identification depend on the type of aeronautical product and the manufacturer. Generally, aeronautical products are identified as specified in the approved type design except certain restrictions apply to the use of the part number as listed in the approved type design if the part is not manufactured by an OEM or an organization that has a licensing agreement from an OEM.

5.4.2.R5 Verification of Product Conformance

1. Any newly manufactured aeronautical product, including aviation replacement parts intended for installation on an aeronautical product, shall be inspected for conformance to the applicable approved type design, in accordance with the conformity inspection system of the organization.

5.4.2.S5 Verification of Product Conformance

1. The conformity inspection system shall encompass, as applicable, all phases of production from the inspection of incoming material and supplies, through fabrication and assembly to the inspection of the completed product or part. The conformity inspection system shall:

a. establish production inspections throughout the manufacturing cycle including those required at supplier's facility;

b. identify the nature of the inspection to be performed and provide the appropriate instructions at each place of inspection to assure conformance to the approved type design;

c. establish final inspection procedures for the completed product or part, including in the case of aircraft, the manufacturer's flight test procedures and checklist;

d. establish control procedures for checking and calibrating inspection equipment at established periods using referenced standards traceable to national or international standards; and

e. establish records that inspections have been completed as planned.

5.4.2.R6 Recording of Manufacture

1. A person who performs a manufacturing task on an aeronautical product shall ensure that the details required by the manufacturing control system of the organization are entered into the applicable organizational record in respect of the task performed.

5.4.2.R7 Certification of Manufacture

1. Airworthiness certification following the performance of manufacture of an aeronautical product, including aviation replacement parts intended for installation on an aeronautical product, shall be provided by the signing of a manufacturing product conformance.

2. No person shall sign a manufacturing product conformance or permit anyone whom the person supervises to sign a manufacturing product conformance, unless the manufacturing was performed in compliance with the

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applicable approved type design and the product conformance meets the applicable requirements specified in 5.4.2.S7.

3. No person shall sign a manufacturing product conformance or permit anyone whom the person supervises to sign a manufacturing product conformance, unless the person signing the manufacturing product conformance is specifically authorized for the particular manufacturing task performed by a manufacturing organization acceptable to the TAA.

5.4.2.S7 Certification of Manufacture

1. Manufacturing product conformance is an airworthiness certification that a newly manufactured aeronautical product is in conformance with the applicable approved type design and is in a condition for safe operation. To make a declaration of manufacturing product conformance, a review of production inspection records and an inspection of the actual manufactured product shall be conducted, in accordance with the conformity inspection system of the organization. The standards applicable to a manufacturing product conformance certification are as follows:

a. a manufacturing product conformance certification is required for all newly manufactured aeronautical products including aviation replacement parts intended for installation on an aeronautical product for which the TAA has issued or intends to issue a DND Type Certificate, in accordance with Part 2, Chapter 1;

b. a manufacturing product conformance applies only to the particular aeronautical product or products to which it relates; and

c. each manufacturing product conformance certification shall include the following information:

(1) positive identification of the item by type, class, style, grade, model, part number, description, nomenclature and/or serial number as applicable;

(2) identification of the applicable approved type design;

ADVISORY NOTE

Certification of Conformance documents for aeronautical parts manufactured by an AMfgO should identify all aeronautical types for which the part is eligible for installation.

(3) the following certification or similarly worded statement:

"I certify that the aeronautical product described herein conforms to the specified approved type design and is in a condition for safe operations."

ADVISORY NOTE

The intent of the term "similarly worded statement" is to provide flexibility for organizations who may prefer somewhat different wording and account for an error in wording which will not invalidate the release.

(4) identification of both the signatory and the organization;

(5) for each aircraft, a statement that the aircraft has been flight checked; and

(6) for each aircraft engine or variable pitch propeller, a statement that the engine or propeller has been subjected by the manufacturer to a final operational check.

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ADVISORY NOTES

1. *Manufacturing product conformance certification is normally indicated on a Certificate of Conformance. This certificate should be retained with the item to provide proof of conformance to the applicable approved type design and traceability to an acceptable manufacturer. Acceptable certificates for a newly-manufactured aviation replacement part include:*

   a. *a FAA Airworthiness Approval Tag (FAA Form 8130-3) signed by an authorized FAA representative;*

   b. *a TC Statement of Conformity (Form AI-100) completed by a TC-approved manufacturer;*

   c. *for a locally manufactured part, a Maintenance Release form completed in accordance with an Acceptable Maintenance Organization's (AMO) TAA-approved MPM, provided it satisfies the requirements of 5.4.2.S1.1.b.*

   d. *a Release Certificate or Certificate of Conformance completed, in accordance with an acceptable manufacturer's approved procedures provided it satisfies the requirements of 5.4.2.S7.*

2. *More than one item may be included on a manufacturing product conformance certification provided there is only one destination for all the items and each item is clearly identified and described.*

2. **Manufacturing Product Conformance Authority.** No person shall sign a manufacturing product conformance unless that person has been granted manufacturing product conformance authority, in accordance with 1.4.2B.

3. **Manufacturing Product Conformance Responsibilities.** A person who signs a manufacturing product conformance certifies that:

   a. the item has been inspected, in accordance with the product conformity inspection system of the organization;

   b. the item conforms to the applicable approved type design and is in a condition for safe operation; and

   c. the manufacturing and inspection records are correct.

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SECTION 3

ADVISORY MATERIAL (NOT ALLOCATED)

NOTE

In an effort to provide Advisory Material to TAM users as rapidly as possible, all applicable Advisory Material will be published in the form of TAA Advisories, and will be posted on the DTAES websites, which are updated regularly.

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PART 5
AIRWORTHINESS PROCESSES

CHAPTER 5 - AIRWORTHINESS DOCUMENTATION

SECTION 1

INTRODUCTION

5.5.1.1 Background

1. The acquisition, configuration control and support of an aeronautical product relies on the accuracy and completeness of the airworthiness-related documentation. This documentation must be available for use in the various engineering, manufacturing, maintenance and materiel support activities throughout the life cycle of an aeronautical product. Airworthiness documentation plays a significant role in preserving type design compliance and product conformance, which are essential to assure the airworthiness of an aeronautical product.

5.5.1.2 Airworthiness Documentation Categories

1. To satisfy the necessary traceability and information requirements for both the approved type design and in-service aeronautical products, the Technical Airworthiness Program divides airworthiness-related documentation into the following three categories:

a. **Type Record.** The type record describes the state of airworthiness for a particular aeronautical product approved type design and must be maintained throughout the life of the type design. Retention of the type record is the responsibility of the Type Certificate Holder (TCH). However, certain documents that would normally be considered part of the type record may be retained by other organizations provided the TCH has a process to ensure accessibility and safe-keeping throughout the life of the type design. The Technical Airworthiness Authority (TAA) must approve the disposal of any document within the type record even if the aeronautical product type is no longer in service. As a minimum, the type record consists of initial type design and in-service design certification documentation and miscellaneous design-related reports, such as Quality Deficiency Reports, Flight Safety occurrence reports and Technical Investigations.

b. **Technical Record.** A technical record describes the state of airworthiness and configuration status of a particular aeronautical product and must be maintained current throughout the life cycle of the aeronautical product. Retention of a technical record is the responsibility of the person or organization that has control and custody of the specific aeronautical product for which it applies. A technical record must be transferred whenever control and custody of an aeronautical product changes. Certain documents that normally would be included in the technical record may be retained by other organizations provided there is a process to ensure accessibility and safekeeping. The TCH for an aeronautical product type design is required to establish a technical record management procedure prior to seeking a release to service for a type design. The TAA must approve the disposal of a technical record even if the aeronautical product is no longer in service. Certain documents within a technical record do not have to be retained for the entire life cycle period. For example a maintenance record for an inspection of an aeronautical product may be removed from a technical record as soon as the inspection has been repeated and a new maintenance record placed in the technical record. The documents in a technical record generally include in-service certification and product status documentation, such as maintenance release and aircraft release records, flight authority records, conformance certificates, configuration status data, airworthiness directive records and deviations from the approved maintenance program.

c. **Organizational Record.** The organizational record describes or supports the airworthiness-related actions and decisions made by individuals employed within an organization regarding the state of airworthiness of a type design or an in-service aeronautical product but are not considered part of the

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type record or technical record. There is no common standard for the retention of documents in an organizational record. Most type design and aeronautical product related documents should be retained for historical or business purposes as long as the type design is active and products remain in service. Documents related to the operation of the organization such as the procedures manuals and work instructions must be retained as long as it is necessary to provide traceability for TAA audit purposes. In most cases this will be from three to five years. Documents related to personnel records should be retained as per 5.5.2.R3. The documents in an organizational record generally fall into two sub-categories. Corporate documents normally include configuration, engineering, logistics, maintenance, and materiel support plans as well as the Airworthiness Process Manual (APM) and related enabling quality policies and procedures for the organization. Personnel documents include training, qualification and authorization records for individuals within the organization.

2. **Technical Publication Management.** The fundamental principles of the DND/CAF Airworthiness Program requires that all airworthiness-related activities are completed to acceptable standards, by authorized personnel, within Acceptable Organizations, using approved procedures. In keeping with these principles, any organization responsible for performing on/off aircraft maintenance, design, engineering and material support activities will require a publication management control system. The primary goal of this system is to ensure that all activities performed are carried out using the latest approved version of the applicable publication(s) and that all relevant publications are available to support the scope and depth of work performed for the organization.

3. **Electronic Record Keeping Systems.** In order to comply with the airworthiness documentation requirements of this chapter an Acceptable Organization will normally require an Electronic Record Keeping System (ERKS). The complexity of the system will depend on the scope and depth of engineering, manufacturing, maintenance and materiel support activities performed by the organization. In general, the ERKS may be used to deliver technical publications, policy manual, quality processes and work instructions required by the organization and to automate reporting processes, such as flight safety incidents, unsatisfactory conditions, engineering change proposals and configuration status reports. It can also be used to record maintenance activities and certifications and track configuration and usage status on a particular aeronautical product. If electronic signatures are used, a system must be in place to uniquely identified and authenticate the individual certifying the activity. Regardless of the scope and intent of the ERKS, the system must be protected against accidental loss and tampering of the data, and backups/redundancies must be in place in the event that the system becomes temporarily unavailable. ERKS must be submitted to the TAA for review and airworthiness acceptance.

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SECTION 2

RULES AND STANDARDS

5.5.2.R1 Type Record

1. The type record for an aeronautical product shall contain the information as specified in 5.5.2.S1.1.

2. The Type Certificate Holder (TCH) for an aeronautical product type shall develop and issue procedures for the maintenance of the type record to meet the requirements specified in 5.5.2.S1.2.

3. The contents of the type record shall be retained by the TCH for as long as the aeronautical product type is in-service and shall not be disposed of without Technical Airworthiness Authority (TAA) approval even if the product type is no longer in active service.

ADVISORY NOTE

TAA's AF9000 procedure TAA04.011 defines the Airworthiness Rescission Process and describes the TCH's responsibilities for transfer of the Type Record to the TAA when a fleet is no longer in service.

5.5.2.S1 Type Record

1. The Type Record for an aeronautical product type is the airworthiness-related documentation that proves the state of airworthiness of an approved type design and shall include the following:

a. Statement of Operating Intent (SOI) as specified in 2.1.2.S1.2;

b. Statement of Operational Requirement (SOR);

c. Final approved Certification Basis;

d. Type Certificate and Type Certificate Data Sheet (TCDS) as specified in 2.1.2.S8, (original and all subsequent revisions);

e. Copies of any Type Certificates and Type Certificate Data Sheets or equivalent documents issued by another airworthiness regulatory agency upon which the DND Type Certificate issued by the TAA is based;

f. Compliance record as specified in 2.1.2.S1.9;

g. Copies of all analysis, inspection and test reports used to establish airworthiness compliance;

h. Any issue papers prepared during type certification;

i. Documents that define the approved type design as specified in 2.1.2.S1.12;

ADVISORY NOTE

These documents generally consist of either technical data such as the drawings and specifications necessary to define design features and to assure product conformance or publications such as airworthiness limitations and flight manual.

j. Approved design-related deviations and waivers;

k. Approved design changes including the submitted application, compliance record with associated compliance substantiating reports and design change certificate issued, as described in Part 3, Chapter 2;

l. Other authorized changes to the approved configuration specified in the approved type design;

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ADVISORY NOTE

This includes minor design changes as described in Part 3, Chapter 2.

m. Applicable Airworthiness Directives issued by the TAA and other airworthiness regulatory authorities in accordance with Part 5, Chapter 6, including any TAA-approved exemptions and alternative means of compliance;

n. Annual Airworthiness Reports submitted to the TAA in accordance with Part 3, Chapter 4; and

o. Copies of airworthiness risk assessments performed in accordance with Part 5, Chapter 1, to substantiate an airworthiness-related decision regarding a potential design deficiency or airworthiness degradation.

2. The type record for an aeronautical product type is important during the in-service phase to assure continuing airworthiness, resolve airworthiness-related problems and introduce design changes when reference to the approved type design including any approved design changes is essential. The procedures developed by the TCH for managing the type record shall:

a. Assign responsibility for the control and custody of all documents which form part of the Type Record for an aeronautical product approved type design;

b. Ensure documents in the type record are never amended although amendments to correct errors are permitted provided the incorrect entry is struck out in such a manner that the underlying information remains legible, and the correct entry inserted with the date, reason for alteration and person's name and signature who made the correction. Changes or new information will be added to the type record as revised documents with the originals retained on file; and

c. All of the necessary measures are taken to protect the type record documents from damage and loss.

ADVISORY NOTES

1. *The TCH need not have actual physical control and custody of all of the documentation in the type record. For example, compliance-substantiating data may be retained by the Design Authority on behalf of the TCH. Whatever arrangements are made for custody and control of the type record documentation, the TCH remains responsible for it and should have access to whatever level of detail may be required in future. This requirement may be satisfied by some contractual or other agreement that provides for specific documentation to be available to the TCH only on an as or when required basis.*

2. *The TCH should exercise care for type record documents, which are retained within the normal file management system of the organization to ensure that retrieval in future is possible. The short-term, long-term and archive storage procedures may delay or prevent access to necessary records.*

5.5.2.R2 Technical Record

1. The technical record for an aeronautical product type shall contain the information, as specified in 5.5.2.S2.1.

2. The TCH for an aeronautical product type shall develop and issue procedures for the maintenance of technical records to meet the requirements specified in 5.5.2.S2.2 to 5.5.2.S2.4, as applicable.

ADVISORY NOTE

The procedures for the maintenance of aircraft technical records by CAF units have been standardized and are provided in C-05-005-P04/AM-001. If these procedures do not satisfy all airworthiness requirements, the TCH for the affected aircraft type may issue additional instructions.

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3. Every organization in control and custody of an aeronautical product shall maintain the technical record in accordance with the procedures issued by the TCH for the aeronautical product.

4. Every organization that transfers control and custody of an aeronautical product to another organization shall, at the time of the transfer, also deliver all of the associated documents in the technical record to that organization.

5.5.2.S2 Technical Record

1. The Technical Record for an aeronautical product shall include the following:

   a. Aeronautical product identification;

   b. Total time in-service;

   c. Current status of life limited parts;

   d. Time since overhaul of all items installed which have a specified overhaul period;

   e. Identification of the current inspection status including the time since last inspections required by the maintenance program under which the aeronautical product appliances are maintained;

   f. If included in the technical record, maintenance procedure issued by the TCH in accordance with 5.5.2.R2.2, the current status of applicable Airworthiness Directives including the date and methods of compliance, and if the Airworthiness Directive involves recurring action, then the time and date when the next action is required;

   g. Current status of all special inspections or equivalent instructions issued by the TCH for the aeronautical product type;

   h. Current status of all modifications;

   i. Maintenance performed in accordance with 3.1.2.S2;

   j. The applicable maintenance release in accordance with 3.1.2.S10;

   k. The applicable aircraft release in accordance with 3.1.2.S11; and

   l. A weight and balance report or information in accordance with the weight and balance control system implemented in accordance with 3.1.2.S1.

2. The technical record procedures developed for an aeronautical product shall have provisions for the following:

   a. Every entry in a technical record shall be made in an accurate, legible and permanent manner;

   b. Every entry in a technical record regarding maintenance performed on the aeronautical product shall include the person's name and signature or employee identifier, and the date of the entry;

   c. Every person who brings into use a new volume of an existing technical record shall ensure that an unbroken chronological record is maintained;

   d. Where a person alters an entry in the technical record for the purpose of correcting the entry, the person shall do so by striking out the incorrect entry in such a manner that the underlying information remains legible, and inserting the correct entry together with:

      (1) date of the alteration;

      (2) reason for the alteration; and

      (3) the person's name and signature or employee identifier.

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e. When flying hours are used to determine the interval between maintenance tasks, the flying hours shall be the interval from the moment an aircraft leaves the ground until it touches the ground at the end of the flight unless specified otherwise by the TCH for the aircraft type;

f. All necessary measures are taken to protect the technical record from damage and loss; and

g. Where a component is installed on a higher assembly, the technical record for that component shall become a part of the technical record for the higher assembly.

3. The technical record procedures developed for an aircraft shall include the following:

a. A division of the technical record into two parts consisting of:

(1) **Servicing Set or Journey Log -** the daily working copy of technical records necessary to document that an aircraft is safe for operations, as specified in Annex A; and

(2) **Log Set or technical record -** the historical copy of technical records necessary to document that an aircraft is airworthy, as specified in Annex B.

ADVISORY NOTE

The Log Set or technical record for an aircraft is generally maintained as a separate document for the airframe, each installed engine and each propeller.

b. The particulars set out in column I of an item in Annex A shall be recorded in the servicing set / journey log at the time set out in column II of the item and by the person responsible for making entries set out in column III of that item;

c. Where particulars of any maintenance performed on an aircraft are transferred from the servicing set / journey log to the log set / technical record at the time set out in column II of item 4 of Annex B, the person responsible for the entry shall:

(1) transcribe the particulars including the name and identification of the person who made the original entry; or

(2) where the pages of the servicing set / journey log have detachable copies, attach the copy of the page containing these particulars to the applicable log set / technical record.

d. Unless recorded in an operational flight plan / flight manifest, the pilot-in-command of an aircraft shall record in the servicing set / journey log the following particulars in respect of each flight:

(1) the names of all of the crew members and their duty assignments;

(2) the places and times of departure and arrival;

(3) the flight time;

(4) the nature of the flight such as type of mission or task; and

(5) any incidents or observations relating to the flight.

e. No person shall make a single entry in a servicing set / journey log in respect of a series of flights unless the aircraft is operated by the same pilot-in-command throughout the series;

f. Unless otherwise specified in the weight and balance control system implemented in accordance with 3.1.2.S1.1.d(7), the weight and balance report shall include:

(1) a listing of all items required by the approved type design for the aircraft type;

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(2) an equipment list for any additional items of equipment to be installed in the aircraft that are not part of the approved type design. The equipment list shall have provisions for the associated weight and moment arm for any added items of equipment. This list constitutes a part of the weight and balance report;

(3) provisions for amendments to account for any changes to the empty weight and balance of an aircraft as the result of modifications, repairs or equipment removal/installation. The amendments to the weight and balance report shall include:

(a) an explanation and effective date of the change;

(b) the items affected, and their revised weights and/or moment arms, as applicable; and

(c) a statement of the new empty weight and centre of gravity.

(4) where an aircraft is likely to operate in two or more different configurations, a separate addendum to the weight and balance report for each configuration, where each addendum:

(a) contains a supplementary list clearly showing the differences from the original basic aircraft configuration;

(b) includes the empty weight and balance for the applicable configuration;

(c) clearly identifies the applicable aircraft configuration; and

(d) includes provisions for identifying the currently applicable addendum to the weight and balance report.

4. The technical record procedures developed for an aeronautical product shall ensure retention for the following periods:

a. Records pertaining to repetitive inspections of the aeronautical product need only be retained until the inspection activity is repeated;

b. Records of the last complete overhaul shall be retained until the work is superseded by work of equivalent scope and detail;

c. For life-limited parts, the records specified in 5.5.2.S2, shall be retained with the aeronautical product until its disposal; and

d. For aircraft, the records in the servicing set / journey log shall be retained for a period of not less than one year.

5.5.2.R3 Organizational Record

1. The Organizational Record for an Acceptable Organization, which has been assigned technical airworthiness authority in accordance with Part 1, Chapter 4, shall contain the information as specified in 5.5.2.S3.1.

2. Acceptable Organizations, which have been assigned technical airworthiness authority in accordance with Part 1, Chapter 4, shall develop a system for the control and management of an organizational record to meet the requirements specified in 5.5.2.S3.2.

3. Every organization in control and custody of documents included in an organizational record shall retain the documents in accordance with 5.5.2.S3.3.

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5.5.2.S3 Organizational Record

1. The Organizational Record for an Acceptable Organization shall include the following:

   a. Corporate airworthiness documentation shall contain:

      (1) information and data, such as records, data, inspection plans, work instructions and reports which provide a history of airworthiness-related decisions for an approved type design or aeronautical product that are not considered part of either a type record or technical record;

      (2) TAA accreditation/recognition-related files;

      (3) Airworthiness Process Manual (APM) and associated documents included by reference in accordance with Part 1, Chapter 4;

      (4) airworthiness-related procedure manual; and

      (5) airworthiness-related quality records and audit documentation.

   b. Personnel Airworthiness documentation shall contain:

      (1) information and data associated with the authorization of individuals within an organization in accordance with the personnel authorization system requirements of Part 1, Chapter 4.

2. The organizational record management system shall provide for the production, amendment, storage and retrieval of information and data associated with technical airworthiness functions and airworthiness-related activities as follows:

   a. all of the necessary measures are taken to protect the organizational record documents from damage and loss for the period specified at 5.5.2.S3.3;

   b. a logical document classification and retrieval system which enables easy access and control of documents while in use;

   c. an amendment process which ensures amendment, where applicable, are managed and controlled; and

   d. provisions for periodic record auditing.

3. Airworthiness documentation relating to the performance of technical airworthiness functions for an aeronautical product shall be retained as follows:

   a. Corporate airworthiness documentation shall be retained for at least a period of five years to provide traceability for TAA audit purposes; and

ADVISORY NOTE

Corporate airworthiness documentation related to an approved type design or a product should be retained as long as the type design is active and products remain in service.

   b. Personnel records shall be retained for at least a period of five (5) years after a person is no longer employed with the organization.

5.5.2.R4 Technical Publication Management

1. Acceptable Organizations, which have been assigned technical airworthiness authority in accordance with Part 1, Chapter 4, shall develop procedures for the control and management of technical publications, which meet the requirements specified in 5.5.2.S4.

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5.5.2.S4 Technical Publication Management

1. The technical publication management and control procedure shall have provisions for:

   a. Assigning responsibility for the control and custody of all technical publication holdings which form part of the Type Record for an aeronautical product as defined in 5.5.2.S1.1.i;

   b. Maintaining a master index of all publications which identifies the date of issue and any subsequent revisions including temporary amendments;

   c. Incorporating revisions and temporary amendments to all publications in a manner which ensures that only the most current version of the document is available to support design, engineering, maintenance and materiel support activities, as applicable to the organization;

   d. Periodic verification and validation of publication holdings;

   e. Reporting and correcting discrepancies to technical publications; and

   f. Identifying and establishing a training, qualification and authorization system of individual responsible for the control and custody of publications holdings.

ADVISORY NOTE

TAA Advisory 2007-02 - Technical Publication Management *is provided to organizations seeking TAA acceptance of new or significantly changed publication management control systems.*

5.5.2.R5 Electronic Record Keeping Systems

1. Record keeping systems, including computer records that do not comprise entries on paper, used to comply with the airworthiness documentation requirements of this chapter, including electronic signatures for the certification of technical airworthiness functions, shall meet the requirements of 5.5.2.S5.

5.5.2.S5 Electronic Record Keeping Systems

1. The integrity of electronic record keeping systems for airworthiness documentation must be maintained at all times. In particular, electronic record keeping systems must satisfy the following criteria:

   a. Measures must be taken to ensure that the records contained in the system are protected, by electronic or other means, against accidental loss or alteration and against tampering.

   b. Hard copies of the records contained in the recording system must be accessible on demand.

   c. The electronic data system must meet all requirements in 5.5.2.R1, 5.5.2.R2 or 5.5.2.R3, for the scope of record keeping that the organization intends the electronic system to cover.

   d. The electronic system must allow for airworthiness activities to be performed in a manner that meets the associated TAM rule and standard for the airworthiness activity.

   e. Where a correction is made to an airworthiness documentation record that is maintained as electronic data, the correction shall be made in a manner that does not render the original data inaccessible.

   f. Procedures, user manuals and work instructions must be established that will ensure that an adequate level of control is maintained on all processes involving electronic records and signatures. This includes instructions for:

      (1) Performing all routine technical activities within the organization that the electronic system supports;

      (2) Performing in-service verifications of electronic data to ensure accuracy;

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(3) Performing data configuration changes within the electronic system;

(4) Recovering data when the system is corrupted; and

(5) Procedures for changing system software functionality that allow for independent audit.

g. If electronic signatures are used, the electronic data system must satisfy the requirements of 5.5.2.S5.2.

h. Systems that maintain aeronautical product technical records or that record details of maintenance work must have a back-up system that ensures aircraft can continue to operate while the system is down and the capability to allow for aircraft operation on deployed operations.

2. An acceptable electronic signature means an electronic signature that results from the application of electronic technology that satisfies the following criteria:

a. It must have no less a guarantee of authenticity than a handwritten signature.

b. The electronic signature resulting from the use by a person of the electronic technology must be unique to that person.

c. The use of the electronic technology by a person to incorporate, attach or associate the person's electronic signature to an electronic document must be under the sole control of that person.

d. An individual using an electronic signature must take deliberate and recognizable action to affix his or her signature as opposed to, for example, merely accepting or rejecting a prompt or default.

e. The scope of information being affirmed with the electronic signature must be clear to the signatory and to subsequent readers of the electronic record or document.

f. The electronic technology must be capable of identifying the person.

g. The electronic signature must be linked with an electronic document in such a way that it must be possible to determine whether the electronic document has been changed since the electronic signature was incorporated in, attached to or associated with the electronic document.

ADVISORY NOTE

TAA Advisory 2007-03 - Electronic Signature Requirements *is provided to organizations seeking TAA acceptance of electronic signatures.*

3. Prior to an Acceptable Organization implementing and using an electronic record keeping system, a system description shall be submitted to the TAA for review and TAA acceptance.

ADVISORY NOTE

TAA Advisory 2007-01 - Electronic Record Keeping System *is provided to organizations seeking TAA acceptance of new or a significantly changed corporate Electronic Record Keeping System (ERKS).*

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ANNEX A

RECORDING OF MAINTENANCE SERVICING SET / JOURNEY LOG

	COLUMN I	COLUMN II	COLUMN III
Item	**Particulars to be Entered**	**Time of Entry**	**Person/Organization Responsible for Entry**
1	Aircraft registration marks, aircraft manufacturer, type, model and serial number.	On commencing keeping a Servicing Set and on bringing a new volume of an existing log into use.	Organization in control and custody of the aircraft.
2	Aircraft empty weight and empty centre of gravity and any change to the aircraft empty weight and empty centre of gravity.	On commencing keeping a Servicing Set and on bringing a new volume of an existing log into use and, when a change occurs as soon as practicable after the change, but at the latest before next flight.	Organization in control and custody and for any change the person who made the change.
3	Flying hours of each flight or series of flights and cumulative total air time and, where applicable, number of landings since date of manufacture.	Daily, on completion of each flight or series of flights.	The pilot-in-command of the aircraft.
4	A description of the applicable maintenance schedule; and the date, flying hours, operating time or landing at which the next scheduled maintenance action is required.	On bringing the maintenance schedule into use and on completion of each maintenance action referred to in COLUMN I of this item.	Organization in control and custody of the aircraft.
5	Particulars of any abnormal occurrences to which the aircraft has been subjected.	As soon as practicable after the abnormal occurrence but, at the latest, before the next flight.	The pilot-in-command of the aircraft or, where maintenance was being conducted, the operator of the aircraft at the time of the abnormal occurrence.
6	Particulars relating to a conditional maintenance release signed pursuant to 3.1.2.R10.4.	As soon as practicable after the aircraft has received a conditional maintenance release for a maintenance test flight but, at the latest, prior to the maintenance test flight.	The person who signed the conditional maintenance release.
7	Particulars relating to the results of a test flight entered in accordance with 3.1.2.R10.5.	On completion of the test flight but, at the latest before next flight.	The pilot-in-command of the aircraft who conducted the test flight.
8	Particulars of any defect in any part of the aircraft or in any of its equipment.	As soon as practicable, after defect is discovered but, at the latest, before next flight.	The person who discovered the defect.

Figure 5-5-2-1 (Sheet 1 of 2) Maintenance Servicing Set / Journey Log

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	COLUMN I	COLUMN II	COLUMN III
Item	**Particulars to be Entered**	**Time of Entry**	**Person/Organization Responsible for Entry**
9	Particulars of any maintenance action performed with respect to Items 2, 5, or 8.	As soon as practicable, after the maintenance action is performed but at the latest, before next flight.	The person who performed the maintenance action.
10	Particulars of any operational restrictions to which the aircraft may be subject.	As soon as practicable, but at the latest, before next flight.	The person who authorized the operational restriction.
11	The maintenance release required for any maintenance action including but not limited to those actions required by Item 9 or 10.	As soon as practicable after the maintenance action is performed but at the latest, before next flight.	The organization in control and custody of the aircraft is responsible for ensuring that the maintenance release is signed by an authorized person.
12	The aircraft release required following the completion of maintenance.	As soon as practicable after the maintenance release in Item 11 has been signed but at the latest, before next flight.	The organization in control and custody of the aircraft is responsible for ensuring that the aircraft release is signed by an authorized person.

Figure 5-5-2-1 (Sheet 2 of 2) Maintenance Servicing Set / Journey Log

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ANNEX B

RECORDING OF MAINTENANCE LOG SET / TECHNICAL RECORD

	COLUMN I	COLUMN II	COLUMN III
Item	**Particulars to be Entered**	**Time of Entry**	**Person/Organization Responsible for Entry**
1	a. manufacturer name, type, model designation and serial number and in the case of an airframe the registration number; b. in the case of an engine, propeller or component, the identification number of the aircraft or higher assembly on which the aeronautical product is or has been installed; and c. the identification of any features of the configuration of the airframe, engine, propeller or component that would affect its use or its suitability for installation on a higher assembly.	On commencing keeping a technical record, on bringing a new volume of an existing record into use, after any change in the data on the manufacturer's data plate or following installation or removal of an engine, propeller or component.	Organization in control and custody of the aircraft.
2	Any abnormal occurrence to which the airframe, engine, propeller or component has been subjected and that has been recorded in the servicing set pursuant to Item 5 of Annex A.	No later than 30 days after the abnormal occurrence.	Organization in control and custody of the aircraft.
3	The particulars of any maintenance performed including the particulars of any maintenance performed to comply with the requirements of an airworthiness directive, a modification or a special inspection.	Particulars shall be transferred from the servicing set, no later than 30 days after the maintenance action.	The person who performed the action or where particulars are transferred from the servicing set, the organization in control and custody of the aircraft.
4	Time since new, time since overhaul and, where applicable, the number of operating cycles or landings since the date of manufacture, at the time of each abnormal occurrence or maintenance action recorded pursuant to Item 2 or 3.	At the time the abnormal occurrence or maintenance action is recorded pursuant to Item 2 or 3.	The person responsible for the entry pursuant to Item 2 or 3.

Figure 5-5-2-1 Maintenance Log Set / Technical Record

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SECTION 3

ADVISORY MATERIAL (NOT ALLOCATED)

NOTE

In an effort to provide Advisory Material to TAM users as rapidly as possible, all applicable Advisory Material will be published in the form of TAA Advisories, and will be posted on the DTAES websites, which are updated regularly.

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PART 5
AIRWORTHINESS PROCESSES

CHAPTER 6 - TAA AIRWORTHINESS DIRECTIVES

SECTION 1

INTRODUCTION

5.6.1.1 Background

1. An Airworthiness Directive (AD) is a product-related airworthiness order issued by the TAA. An AD may either be permanent or temporary depending on the circumstances or technical problem that originated the requirement for the AD. A notice issued by another airworthiness regulatory authority may be recognized as equivalent to a TAA-issued AD depending on its applicability to a DND-registered aircraft.

2. An AD is developed and issued by the TAA when mandatory action is necessary to rectify a potential degradation in the level of safety for in-service aeronautical products from a design deficiency or product shortcoming. Unless the TAA considers that an alternative action will assure an acceptable level of aviation safety, the TAA will issue an AD to direct mandatory action by the Type Certificate Holder for an aeronautical product when:

a. an unsafe condition exists in an aeronautical product and the condition is likely to exist or develop in other aeronautical products;

b. it has been found, subsequent to the granting of a TAA airworthiness approval to a type design or a design change to an approved type design, that the aeronautical product approved type design does not comply to the requirements of the applicable approved Certification Basis;

c. it is necessary to modify or cancel the requirements of an airworthiness directive issued by another airworthiness regulatory authority having jurisdiction over the type design or design change on which the TAA airworthiness approval was granted; or

d. it is necessary to modify or cancel a TAA-issued AD because the conditions have changed or cease to exist.

3. Compliance with a TAA-issued AD or an equivalent notice issued by another regulatory authority is mandatory for all aeronautical products affected unless the TAA approves an exemption. In many cases, the means and time of compliance will be specified in the AD. In these situations, the means and time of compliance shall be adhered to unless the TAA approves an alternative means of compliance or a compliance extension.

4. **Consultation Process.** A consultation process has been incorporated into the Technical Airworthiness Program for the development of an AD prior to issue by the TAA. The purpose of this process is to permit a review by the applicable organizations and personnel involved. Consultation assesses the applicability of the AD and the feasibility of its implementation. This process will be used for all ADs wherever possible; however, the TAA may issue an AD without consultation if urgent action is considered essential or immediate issue is in the best interests of DND and the CAF.

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SECTION 2

RULES AND STANDARDS

5.6.2.R1 Airworthiness Directive (AD) Compliance

1. Subject to 5.6.2.R1.3 and 5.6.2.R1.4, the Type Certificate Holder (TCH) for an aeronautical product approved type design shall take action to prevent the release of aircraft to operational missions/taskings that incorporate the aeronautical product, unless the aircraft is in compliance with:

   a. the requirements of an AD issued by the TAA; and

   b. except as provided in 5.6.2.R1.2, the requirements of a notice equivalent to a TAA AD issued by:

      (1) the airworthiness authority that, at the time the notice was issued, was responsible for the type design of the aeronautical product on which the TAA airworthiness approval is based; or

      (2) the airworthiness authority of the state that manufactured the aeronautical product if the TAA has not granted an airworthiness approval to the type design.

ADVISORY NOTES

1. *The applicability of an AD or equivalent notice issued by another airworthiness authority should be assessed for the intent of the AD. This ensures that differences in the configuration and operation of the aeronautical product type are taken into account. For example, the intent of an AD may still apply even if the part numbers listed in the AD are different from the TAA-approved type design. If any doubt exists regarding the applicability of an AD, the TAA should be consulted.*

2. *The TCH for an aircraft type may use any available means to transmit the requirements of an AD to the applicable maintenance organizations and operational squadrons in control and custody of the affected aircraft. The most common means used for CAF military aircraft types include a special inspection (SI), an urgent modification, and an out of sequence inspection (OSI).*

3. *If an AD is issued against an aeronautical product that is not an aircraft type, then liaison between the Engineering Authority for the aeronautical product and the TCH for the affected aircraft type is required.*

4. *AD issued by other airworthiness authorities, such as TC and FAA are sometimes received late by DND and warrant submission of a request for an extension of compliance deadline in accordance with 5.6.2.S1.3.*

2. In case of a conflict between an AD issued by the TAA and an equivalent notice issued by another airworthiness authority, the TAA AD takes precedence.

3. The TAA may exempt the TCH for an aeronautical product from the requirement to comply with all or part of an AD, subject to appropriate conditions relating to aviation safety, where the TCH submits a request in accordance with 5.6.2.S1.3, which demonstrates to the TAA that:

   a. under circumstances specified in the exemption request, compliance is impractical or unnecessary; and

   b. the exemption will provide a level of safety that is equivalent to that required by the AD.

4. The TAA may approve an alternative means of compliance to an AD, where the TCH submits a request in accordance with 5.6.2.S1.3, and the TAA is satisfied that the proposed alternative will maintain the level of safety that is afforded by the AD.

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ADVISORY NOTE

An alternative means of compliance can be, but is not necessarily, limited to the following:

a. *an alternate modification;*

b. *an alternate inspection procedure;*

c. *a different inspection schedule;*

d. *an extension to the compliance deadline; or*

e. *a specified operating procedure or limitation.*

5.6.2.S1 Airworthiness Directive (AD) Compliance

1. For an AD issued by the TAA or an equivalent notice issued by another airworthiness authority, the TCH for an affected aircraft type shall:

a. provide direction, referencing the AD number or equivalent notice, to all applicable organizations and persons in control and custody of affected aircraft including:

(1) the actions to be taken to comply with the requirements of the AD including operation of aircraft with any outstanding actions against it or its components;

(2) the appropriate entries to be made in accordance with 3.1.2.R9 in the applicable technical records as defined in 5.5.2.S2; and

(3) the reporting requirements regarding compliance with the AD.

b. ensure appropriate entries are made in the type record as defined in 5.5.2.S1.1, including the following information:

(1) the AD number or equivalent notice;

(2) any TAA-approved exemption in accordance with 5.6.2.R1.3;

(3) any TAA-approved alternative means of compliance in accordance with 5.6.2.R1.4;

(4) the means used to comply with the requirements of the AD including any recurring actions/ inspections; and

(5) the status of compliance for all affected aeronautical products.

2. Persons in control and custody of aircraft are to ensure that:

a. the direction issued by the TCH regarding compliance with the requirements of an AD is scheduled; and

ADVISORY NOTE

Failure to comply with the requirements of an issued AD causes the flight authority for the affected aircraft issued in accordance with Part 5, Chapter 7, to be out of force. Therefore, an Aircraft Release in accordance with 3.1.2.R11, cannot be signed to release the aircraft to operational missions or taskings until compliance with the requirements of an AD are satisfied.

b. the appropriate entries are made in the applicable technical records in accordance with the direction provided by the TCH.

3. **Application for Approval of an Exemption or Alternative Means of Compliance.** Application for exemptions and alternative means of compliance to AD are to be made, in writing, by or through the appropriate Engineering Authority for the aeronautical product concerned. In no circumstance is a request for an exemption to

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an AD issued by another airworthiness authority applicable to a DND-registered aircraft to be made directly to that airworthiness authority. An application for an exemption or alternative means of compliance must provide evidence that the requested exemption or alternative means of compliance will provide a level of safety equivalent to that of the original AD requirements. The application shall provide complete details regarding the requested exemption or alternative means of compliance, including:

a. aircraft type;

b. aircraft serial number;

c. applicant's name and position;

d. organization making the application;

e. AD number;

f. parts and/or components involved;

g. exact details of the proposed change together with reasons for the application and evidence of equivalent safety;

h. drawings and/or sketches to clearly describe inspections, repairs or modifications; and

i. date required by.

ADVISORY NOTES

1. *The exemption or alternative means of compliance will be given an approval number to record in the type record of the affected aeronautical product. An example of this approval number would be "TAA 1997/A-02" which is broken down as follows:*

   a. *"TAA" - self explanatory;*

   b. *"1997" - the year;*

   c. *"A" - alternative means of compliance or "E" - exemption; and*

   d. *"02" - the sequential number assigned by the TAA.*

2. *Information about the existence of any TAA-approved exemption, or alternative means of compliance, is available upon request from the TAA.*

3. *An exemption or alternative means of compliance issued by another airworthiness authority who issued the related AD are tacitly accepted by the TAA. However, the TAA may overrule the exemption or alternative means of compliance.*

4. *Following the publication of an AD, the FAA also occasionally issues, by means of a manufacturer's service bulletin, an exemption or alternative means of compliance to such an AD. This exemption or alternative means of compliance normally requires that the American aircraft owners request individual approval from their local FAA office. This FAA exemption or alternative means of compliance does not apply to a DND-registered aircraft; an application must be submitted to the TAA for an exemption or alternative means of compliance to these FAA AD. However, the information required by the application for an exemption or alternative means of compliance can be satisfied by including a copy of the manufacturer's service bulletin.*

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SECTION 3

ADVISORY MATERIAL

NOTE

In an effort to provide Advisory Material to TAM users as rapidly as possible, all applicable Advisory Material will be published in the form of TAA Advisories, and will be posted on the DTAES websites, which are updated regularly. The Advisory Material presented in this section will eventually be converted into a TAA Advisory.

5.6.3.1 Airworthiness Directive Format

1. Most airworthiness regulatory authorities use a standard format for airworthiness directives (AD) or equivalent notices. The principal parts are as follows:

a. **Heading.** The term **Airworthiness Directive** or equivalent appears in the heading. For an urgent AD, the heading may also include "URGENT - URGENT - URGENT" to indicate that immediate attention is required of the recipient;

b. **Identifier.** An identifier is assigned to each AD consisting of at least a specific nationality code, year of issue and serial number. The manufacturer's name and the revision status of the AD may also be included. For example, CF-2000-01R2 DE HAVILLAND is a Transport Canada AD where:

(1) CF designates the country - Canada;

(2) 2000, the year;

(3) 01 is the sequential number of the AD;

(4) R2 is the second revision of the AD; and

(5) DE HAVILLAND is the manufacturer of the aeronautical product to which the AD applies.

c. **Product Affected.** Specifies the aeronautical product affected (the aircraft, engine, propeller, etc.) including the model designation of the product, and if applicable, the serial numbers or configurations affected;

d. **Compliance.** Specifies the period provided for compliance (in flying hours, number of flights, or pressurization cycles, etc.) and/or intervals for recurring measures that apply;

e. **Unsafe Condition.** Describes the unsafe condition that the AD is being issued to correct;

f. **Corrective Action.** Provides a statement of the corrective measures or limitations required, including the method of compliance;

g. **Effective Date.** States when the AD and its measures become effective, taking into account the period provided for compliance in 5.6.3.1.1.d;

h. **Signature.** The signature of the airworthiness authority or authorized representative who issued the AD;

i. **Postscript.** Some civil airworthiness authorities include a postscript after the signature block. This postscript, which is not part of the AD proper, states:

(1) whom to contact for further information on the AD;

(2) whether the printed copy is that of an AD issued earlier by telex; and

(3) in the case of a revision, the purpose of the revision.

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PART 5
AIRWORTHINESS PROCESSES

CHAPTER 7 - FLIGHT AUTHORITY

SECTION 1

INTRODUCTION

5.7.1.1 Background

1. The term "flight authority" does not have a single clear definition that is used consistently by both civil and military aviation. In civil aviation, the term normally refers to Certificates of Airworthiness and Flight Permits that are issued by the Civil Aviation Authority. In the military context, flight authority has a wider range of definitions which may include any of the following:

a. The approval provided to authorize aircrew to fly a particular aircraft on a military mission, such as the daily flight taskings issued by Base Operations.

b. Flight Clearances or Flight Releases, such as those issued by US DoD Military Authorities for USAF and USN aircraft. These are considered to be equivalent documents to the DND Airworthiness Clearances and flight permits.

c. Technical and Operational Airworthiness Clearances, Certificates of Airworthiness and Flight Permits issued by the OAA and TAA.

2. This chapter addresses the third group of these definitions, that is, the flight authority granted by the DND/CAF Airworthiness Authorities (OAA and TAA) in the form of Certificates of Airworthiness and Flight Permits.

5.7.1.2 Types of Flight Authority

1. **Certificate of Airworthiness (CofA).** The granting of a CofA is a technical airworthiness function as defined in Part 1, Chapter 4. It is an airworthiness certification declaring that an individual aircraft is in conformance with the approved type design and in a condition for safe operation.

2. **Flight Permit.** In situations where an aircraft does not meet the conditions for a CofA, or if the CofA is not valid, but the aircraft is otherwise capable of safe flight, a Flight Permit may be issued to provide temporary flight authority. Flight Permits are issued in the following classifications:

a. **Experimental Flight Permit (EFP).** An EFP is issued by the TAA to provide flight authority to DND/CAF registered aircraft conducting test and evaluation flights in support of research and development, engineering flight testing and developmental flight testing.

b. **Specific Purpose Flight Permit (SPFP).** An SPFP is issued jointly by the TAA and OAA to DND/CAF registered aircraft to provide temporary flight authority when the aircraft does not meet the conditions for a CofA, but is capable of safe flight.

c. **Flight Permits - Foreign Military Aircraft.** Flight authority for foreign military aircraft, where the aircraft is under the control and direction of the DND/CAF, may be provided by the DND/CAF Airworthiness Authorities in the form of an EFP or SPFP.

d. **Flight Permits - Civil Aircraft.** Flight Permits may, if appropriate, be issued to civil aircraft by the DND/CAF Airworthiness Authorities, but only if they are conducting military missions for the DND/CAF under a Temporary Authority to Operate (TAO).

3. **Temporary Authority to Operate (TAO).** A TAO is a special type of flight authority issued jointly by the TAA and OAA to authorize aircraft that are on a civil register (and owned and operated by a civilian person or organization)

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to perform a military task, where the aircraft are under the control and direction of the DND/CAF.TAOs are described in B-GA-104-000/FP-001, *Operational Airworthiness Manual (OAM)*, Chapter 3, Paragraph 311.

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SECTION 2

RULES AND STANDARDS

5.7.2.R1 Operation of Aircraft

1. Only aircraft with either a valid Certificate of Airworthiness or Flight Permit may be operated by, or on behalf of, the DND/CAF.

2. Certificates of Airworthiness will not be issued for UAS operating with a Restricted Type Certificate. Instead, a complete listing of serial numbers for Unmanned Aircraft (UA) and ground control stations (GCSs) shall be recorded on the RTCDS.

5.7.2.R2 Certificate of Airworthiness

1. The Technical Airworthiness Authority (TAA) may issue or amend a Certificate of Airworthiness (CofA) in respect of an aircraft:

   a. for which a DND/CAF type certificate has been issued in accordance with Part 2, Chapter 1;

   b. that conforms to the applicable approved type design; and

   c. that is in a condition for safe operation.

5.7.2.S2 Certificate of Airworthiness

1. A CofA is normally issued in the format specified in the TAA Advisory referenced in Section 3, paragraph 5.7.3.1. This advisory contains the CofA template and instructions for the completion of the certificate. Where applicable, the CofA may be in an alternative form, provided that it is acceptable to the TAA.

2. While the TAA normally issues a CofA for each aircraft in a fleet, certification of airworthiness may be shown by an alternative document acceptable to the TAA. A listing of aircraft serial numbers in the Type Certificate Data Sheet may be such an acceptable alternative.

3. An application letter for a CofA shall be submitted to the TAA by the Applicant and shall include aircraft details such as, type, model, serial number and registration number, and a conformity statement made by an authorized individual attesting that the aircraft is in conformance with the approved type design and is in a condition for safe operation.

4. Conformance, by each aircraft serial/tail number, to the applicable approved type design shall be shown by a valid certificate of conformance issued in accordance with Part 5, Chapter 4.

5. The TAA may issue a CofA where a Provisional Type Certificate has been issued. In this case, the CofA will indicate that the aircraft is in conformance with the provisional type design and is in a condition for safe operation. The CofA itself is not 'provisional'; it remains valid when the full Type Certificate is issued.

5.7.2.R3 Flight Permit

1. The TAA or authorized individual may issue or amend a Flight Permit in respect of an aircraft that:

   a. meets the criteria for one of the classifications of a Flight Permit as specified in 5.7.2.S3.1 and 5.7.2.S3.2; and

   b. is in a condition for safe operation.

2. A Flight Permit may be issued in respect of a civil aircraft only if it is conducting military missions for the DND/CAF under a Temporary Authority to Operate (TAO).

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5.7.2.S3.1 Flight Permit

1. A Flight Permit, normally valid for a specified period or number of flights or maximum duration of 12 months, may be granted to an aircraft in one or more of the following circumstances:

   a. The aircraft does not conform to the conditions for the granting of a CofA.

   b. The CofA is temporarily invalid.

   c. The aircraft is to be operated in a manner that would invalidate the CofA.

   d. The CofA is not appropriate for the intended operation.

2. The TAA (or an Authorized Individual) will issue Experimental Flight Permits (EFPs). Specific Purpose Flight Permits (SPFPs) are issued jointly by the TAA (or an Authorized Individual) and the OAA (or an Authorized Individual).

3. An individual who issues a Flight Permit certifies that:

   a. the information contained in the Flight Permit application is sufficient for the type of Flight Permit and planned operation;

   b. where applicable, supporting analyses and assessments (including risk assessments) have been completed and are satisfactory, such that the operation can take place within the assessed level of safety when conducted within the conditions specified in the Flight Permit;

   c. a clear and appropriate set of instructions for the planned operation is available;

   d. suitable instructions for command, control and, where applicable, reporting are included;

   e. suitable instructions for an aircraft conformance statement are included;

   f. the organization(s) responsible for care and custody of the aircraft specified in the Flight Permit have been provided with sufficient operational and maintenance instructions; and

   g. the duration of the Flight Permit is appropriate.

4. An application for a Flight Permit must be submitted by the person in control and custody of the aircraft involved, to an individual who has been assigned the scope and depth of technical airworthiness authority, in accordance with Part 1, Chapter 4, necessary to grant the flight permit.

5. Only an individual with Aircraft Release Authority assigned in accordance with Part 1, Chapter 4, or, in the case of a new aircraft, an authorized representative of the manufacturer, may make a declaration of aircraft conformance for the purpose of releasing an aircraft for flight in accordance with the CofA or Flight Permit.

6. The TAA may inspect any aircraft for which an application for a CofA or Flight Permit has been made, for the purposes of determining conformity with its type design and compliance with the applicable requirements of this chapter.

7. Flight Permits may be renewed if a requirement extends beyond 12 months.

8. Flight Permits are issued in the classifications described in the following paragraphs.

5.7.2.S3.2 Experimental Flight Permit (EFP)

1. An EFP is to be used for any aircraft engaged in aeronautical research and development, for showing compliance with airworthiness and environmental standards, or for any other test purpose including, but not limited to, development testing and evaluation.

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2. EFPs are usually issued to an aircraft in the following situations:

a. Before the granting of airworthiness approval for a new aircraft type design, for the purposes of flight testing to demonstrate compliance with the applicable airworthiness or environmental standards.

b. Before the granting of airworthiness approval for a proposed design change to an existing approved type design, for the purposes of flight testing to demonstrate compliance with the applicable airworthiness or environmental standards.

c. For the purposes of flight testing in support of scientific or engineering research and development.

3. For new aircraft types or a design change assessed as "major and extensive" in accordance with Part 3, Chapter 2, an EFP will normally only be authorized by the TAA. For a design change assessed as "major" in accordance with Part 3, Chapter 2, an EFP may be authorized by an individual who has been assigned the necessary scope and depth of technical airworthiness authority in accordance with Part 1, Chapter 4, except as indicated in following paragraph.

4. The TAA will normally retain the authority to grant an EFP if it involves:

a. testing beyond the design operating limitations specified in the approved type design; or

b. high or extremely high risk.

5. A reference to the TAA Advisory for EFPs is provided in Section 3, paragraph 5.7.3.1. This advisory contains the EFP template and instructions for the completion of the permit.

5.7.2.S3.3 Specific Purpose Flight Permit (SPFP)

1. A SPFP is used for an aircraft that does not conform to the conditions for issue of a CofA but is capable of safe flight. This includes, but is not limited to, one or more of the following situations:

a. The CofA previously granted to the aircraft is temporarily invalid.

b. A CofA has yet to be granted and no other certificate or permit is in force.

c. The CofA is not appropriate for the operation or would be invalidated by the operation.

2. The following are examples of SPFPs:

a. A ferry flight for a damaged or unserviceable aircraft to a base for repairs or maintenance.

b. Crew training flights prior to the issue of a Type Certificate to a new aircraft type and/or the granting of a CofA to a newly manufactured aircraft.

c. Demonstration flights of an aircraft which is not eligible for a CofA, such as a foreign military aircraft where validation of the existing foreign authority is impossible.

d. Other temporary purposes, provided the reason is specified and justified, and is in the interests of the DND/CAF.

3. A reference to the TAA Advisory for Specific Purpose Flight Permits is provided in Section 3, paragraph 5.7.3.1. This advisory contains the SPFP template and instructions for the completion of the permit.

4. **Specific Purpose Flight Permit - Damaged Aircraft.** An SPFP for the ferry flight of a damaged or unserviceable aircraft may only be authorized by an authorized individual who has been assigned the necessary scope and depth of technical airworthiness authority in accordance with Part 1, Chapter 4.

5. **Specific Purpose Flight Permit - Demonstration or Crew Training.** An SPFP for a demonstration flight or crew training flight prior to the granting of a CofA will normally only be issued by the TAA.

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5.7.2.R4 Temporary Authority to Operate (TAO)

1. The TAA, jointly with the OAA (or their authorized individuals), may issue or amend a TAO in respect of an aircraft on a civil register (and owned and operated by a civilian person or organization) in order to perform a military mission under the direction and control of the DND/CAF.

5.7.2.S4 Temporary Authority to Operate (TAO)

1. A TAO, normally valid for a specified period or number of flights or maximum duration of 12 months, may be granted for the operation of civil aircraft on military missions when:

   a. each aircraft has a valid CofA; and

   b. each CofA is appropriate for the intended operation.

2. TAOs may be renewed if a requirement extends beyond 12 months.

3. A reference to the TAA Advisory for TAOs is provided in Section 3, paragraph 5.7.3.1. This advisory contains the TAO template and instructions for the completion of the documentation.

5.7.2.R5 Duration of Certificates of Airworthiness

1. Unless surrendered, suspended or cancelled, and as long as the aircraft continues to meet the conditions subject to which the CofA was issued, the CofA will remain in force indefinitely.

5.7.2.R6 Validation of Foreign Military Aircraft Certificates of Airworthiness and Flight Permits

1. As part of the foreign military aircraft overflight clearance process, where an aircraft is operating under a foreign military CofA, Flight Permit or equivalent document issued in respect of the aircraft or the fleet of which it is a part, and the TAA recognizes that authority and determines that the aircraft is in a condition for safe operation, the TAA may validate the foreign document.

5.7.2.S6 Validation of Foreign Military Aircraft Certificates of Airworthiness and Flight Permits

1. The process for the over-flight of Canadian airspace by foreign military aircraft is administered by the Department of Foreign Affairs and International Trade (DFAIT), in conjunction with A3 Overflight at 1 Canadian Air Division.

2. In addition, the *United States Service Aircraft Over-Flight Regulations*, the *United Kingdom Service Over-Flight Regulations* and the *New Zealand Service Over-Flight Regulations* passed by the Governor-in-Council have granted special privileges to military aircraft from those countries without the need for prior diplomatic clearance from the Department of Foreign Affairs and International Trade Canada or validation of the foreign documentation from the TAA.

3. Notwithstanding the overflight processes and regulations outlined above, the operation of Unmanned Aircraft Systems (UAS) poses particular challenges and risks when operated in civil airspace. Therefore, TAA and OAA staff needs to be consulted about additional procedures to be followed for overflight by these systems.

5.7.2.R7 TAA-issued Flight Permits for Foreign Military Aircraft

1. The TAA, with the agreement or at the request of a foreign military airworthiness authority, may issue a Flight Permit for a foreign military aircraft to operate within Canadian airspace.

2. Normally, foreign military airworthiness authorities will issue their own Flight Permits or equivalent documents when these aircraft are to be operated in Canada, and the TAA will validate these as described in 5.7.2.S6. In the relatively rare cases where this is not possible (e.g., flight testing post modification), the TAA may issue a Flight Permit to a foreign military aircraft. This will only be done with the full and positive agreement, or at the specific and direct request, of a foreign military airworthiness authority.

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5.7.2.R8 TAA-issued Flight Permits for Civil Aircraft Conducting Military Missions

1. The TAA may issue a Flight Permit for a civil aircraft (on the civil aircraft register of Canada or a foreign nation) provided that the aircraft is conducting a military mission under the control and direction of the DND/CAF and that the operation has been authorized by a Temporary Authority to Operate (TAO). If it is considered expedient or desirable for the TAA to issue a Flight Permit for a civil aircraft that is not operating under a TAO, the operation would first have to be authorized by issuing a TAO before a Flight Permit could be issued.

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SECTION 3

ADVISORY MATERIAL

NOTE

In an effort to provide Advisory Material to TAM users as rapidly as possible, all applicable Advisory Material will be published in the form of TAA Advisories, and will be posted on the DTAES websites, which are updated regularly. The Advisory Material presented in this section will eventually be converted into a TAA Advisory.

5.7.3.1 TAA Advisories - Flight Authority

1. The following TAA advisories are available on the TAA Intranet and Internet websites:
   a. 2011-01e Certificate of Airworthiness (CofA)
   b. 2011-02e Specific Purpose Flight Permit (SPFP)
   c. 2011-03e Experimental Flight Permit (EFP)
   d. 2011-04e Temporary Authority to Operate (TAO)
2. These advisories provide the following information:
   a. Word formatted templates for the CofA, SPFP, EFP and TAO;
   b. Instructions for completing the templates;
   c. Guidance for the approval of the permits and certificates; and
   d. Samples of completed permits and certificates.

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PART 5
AIRWORTHINESS PROCESSES

CHAPTER 8 - IDENTIFICATION OF AIRCRAFT AND OTHER AERONAUTICAL PRODUCTS

SECTION 1

INTRODUCTION

5.8.1.1 Background

1. Aeronautical products must be identified in order to provide control and traceability during their procurement, manufacture, installation and maintenance. These two elements of control and traceability are necessary for aviation safety reasons.

2. Aircraft, engines and engine modules, propellers, propeller blades and hubs, life limited components and aircraft appliances are identified by affixing identification plates or some other suitable identification means such as etching, stamping or engraving. In general, the identification includes manufacturer's name, model designation, type certificate and serial number. The location, removal, replacement and alteration of the identification are controlled.

3. The identification requirements for other aeronautical products, such as aviation replacement parts procured in accordance with Part 5, Chapter 2, or manufactured in accordance with Part 5, Chapter 4, depends on the manufacturer of the part. The required identification may take the form of a part number marking, lot or job number and manufacturer identification. The identification requirements for these markings and their content are generally specified in the applicable drawings for the part. However, in certain situations, such as a part manufactured by a maintenance organization, the part number specified in the approved type design for the aeronautical product on which use is intended is not marked on the part.

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SECTION 2

RULES AND STANDARDS

5.8.2.R1 Identification of Aircraft

1. In accordance with 5.8.2.S1, an aircraft identification plate shall be attached to each aircraft prior to flight.

5.8.2.S1 Identification of Aircraft

1. **Identification Plate Content.** The identification plate attached to an aircraft shall have the following information permanently etched, engraved or stamped on it:

   a. name of the manufacturer;

   b. model designation;

   c. Type Certificate; and

   d. aircraft serial number.

ADVISORY NOTE

In the case of a civil type aircraft or a foreign military type aircraft acquired for CAF service, the existing data plate is not to be removed and replaced without instructions from the TAA. In most cases, an additional identification plate with the required DND/CAF information will be attached to the aircraft as close as possible to the original identification plate.

2. **Identification Plate Location.** The identification plate shall be securely attached to the hull, fuselage or an alternative structure of the aircraft in a place where it is visible to a person on the ground, either adjacent to and aft of the rearmost entrance door, or on the fuselage surface near the tail.

3. Where the configuration of the aircraft precludes the attachment of an identification plate in a location specified in 5.8.2.S1.2, the TAA shall, on application in writing by the type certificate holder for the aircraft type, authorize an alternative location for the attachment of the aircraft identification plate.

5.8.2.R2 Identification of Engine, Propeller, Life Limited Component or Appliance

1. An engine, propeller, life limited component or appliance shall be identified as specified in 5.8.2.S2, prior to installation on an aeronautical product.

5.8.2.S2 Identification of Engine, Propeller, Life Limited Component or Appliance

1. An aircraft engine or an aircraft engine module, fixed-pitch propeller, a propeller blade or a propeller hub, a component for which a life limitation has been established and specified in the approved type design or an aircraft appliance shall be identified with the information specified in 5.8.2.S2.2, either:

   a. directly on the aeronautical product by permanently etching, engraving or stamping; or

   b. on a securely attached identification plate.

2. The following identification information shall be placed on the aeronautical product in an accessible location where it is not likely to become damaged, destroyed, lost or detached during normal operation or in an accident:

   a. **Engine Identification:**

      (1) name of the manufacturer;

      (2) manufacturer's model designation as described in the type certificate or equivalent document;

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(3) type certificate number or equivalent designation;

(4) the serial number; and

(5) the power rating established for the engine by the manufacturer.

b. **Propeller Identification:**

(1) name of the manufacturer;

(2) manufacturer's model designation as described in the type certificate or equivalent document;

(3) type certificate number or equivalent designation; and

(4) serial number.

c. **Life Limited Component Identification:**

(1) the part number of the component or an equivalent series of identifying characters; and

(2) the serial number of the component.

d. **Aircraft Appliance Identification:**

(1) name, address and approval number of the manufacturer;

(2) name, type, part number or model designation of the aircraft appliance;

(3) serial number or the date of manufacture of the aircraft appliance; and

(4) type certificate designation or the applicable airworthiness standard.

ADVISORY NOTE

Standards that are considered acceptable for certification of aeronautical products, appliances and component parts are:

a. *All categories of Type certificates;*

b. *Technical Standards orders, FAA-approved for US Certificated Aircraft and Transport Canada Civilian Aircraft adopted for Canadian Certified Aircraft; and*

c. *Accepted standards for common consumable parts, such as AN, MS, etc.*

5.8.2.R3 Modifications

1. When a modification to an aeronautical product results in a change to the model designation, additional identification information, in accordance with 5.8.2.S3, shall be placed on the aeronautical product prior to use of the modified aeronautical product.

5.8.2.S3 Modifications

1. The following additional identification information shall be permanently etched, engraved or stamped as close as possible to the original identification either on an identification plate or directly on the aeronautical product:

a. name of the organization that performed the modification;

b. new model designation;

c. supplemental type certificate or modification leaflet number; and

d. aeronautical product serial number.

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5.8.2.R4 Removal, Replacement and Alteration of Aeronautical Product Identification

1. Subject to 5.8.2.R4.2, the identification on an aeronautical product shall not be removed, replaced or altered, without authorization from the Type Certificate Holder (TCH). In the case of an aircraft identification plate, TAA approval must still be obtained.

2. The identification may be removed from an aeronautical product, without authorization from the TAA, for the purposes of performing maintenance provided that the identification is reattached after completion of work in accordance with 5.8.2.R1 or 5.8.2.R2 as applicable.

5.8.2.R5 Loss, Theft or Damage to an Aeronautical Product Identification

1. Upon receipt of written authorization from the TCH, replacement identification for one lost, stolen or damaged shall be attached to an aeronautical product. In the case of an aircraft identification plate, TAA approval must still be obtained.

5.8.2.R6 Identification of Aviation Replacement Parts

1. Aviation replacement parts procured in accordance with Part 5, Chapter 2, or manufactured in accordance with Part 5, Chapter 4, shall be identified as specified in 5.8.2.S6.

5.8.2.S6 Identification of Aviation Replacement Parts

1. An aviation replacement part shall be identified as follows:

   a. if the part is manufactured by a manufacturer acceptable to the TAA in accordance with 5.4.2.S1.1 (with the exception of TAA-Acceptable Maintenance or Manufacturing Organizations), the part shall be identified as specified in the approved type design for the aeronautical product on which use is intended;

   b. if the part is manufactured by a TAA-Acceptable Manufacturing Organization in accordance with 5.4.2.S1.1, the part shall be identified:

      (1) as specified in the approved type design for the aeronautical product on which its use is intended; and

      (2) in accordance with the part identification process documented in the TAA-approved manufacturing process manual for the organization.

   c. if the part is manufactured by a TAA-Acceptable Maintenance Organization in accordance with 5.4.2.S1.1, the part shall be identified:

      (1) as specified in the approved type design for the aeronautical product on which its use is intended except the part number as specified in the approved type design shall not be marked on the part; and

ADVISORY NOTE

Use of the part number as specified in the approved type design may result in confusion in future regarding traceability of the part. Therefore, an organization should use a locally assigned identifying number such as the addition of a prefix or suffix to the part number or the work order number.

      (2) in accordance with the part identification process documented in the TAA-approved maintenance process manual for the organization including identification of the maintenance organization on the part.

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d. if the part is manufactured by any other organization the part shall be identified:

(1) as specified in the approved type design for the aeronautical product on which use is intended except the part number as specified in the approved type design shall not be marked on the part; and

ADVISORY NOTE

Use of the part number as specified in the approved type design may result in confusion in future regarding traceability of the part. Therefore, an organization should use a locally assigned identifying number such as the addition of a prefix or suffix to the part number or the work order number.

(2) with the organization which manufactured the part.

ADVISORY NOTE

Identification requirements for Canadian military property are provided in DND Standard D-02-002-001/SG-001. These requirements should be harmonized with the TAM requirements for the identification of aeronautical products. Where this standard and the TAM conflict, the TAM requirements will take precedence. This standard also provides information regarding acceptable methods for applying the required marking.

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SECTION 3

ADVISORY MATERIAL (NOT ALLOCATED)

NOTE

In an effort to provide Advisory Material to TAM users as rapidly as possible, all applicable Advisory Material will be published in the form of TAA Advisories, and will be posted on the DTAES websites, which are updated regularly.

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PART 5
AIRWORTHINESS PROCESSES

CHAPTER 9 - EXEMPTIONS AND DEVIATIONS

SECTION 1

INTRODUCTION

5.9.1.1 Purpose

1. The purpose of this chapter is to provide the rules, standards and advisory material for obtaining an exemption or a deviation to a regulatory requirement or standard in the Technical Airworthiness Program.

5.9.1.2 Overview

1. Situations will occur when it is not practical or possible to adhere to a technical airworthiness regulatory requirement or standard and, accordingly, provisions have been made to grant relief via an exemption or a deviation.

2. An exemption is a written authorization from the TAA that a specific airworthiness requirement or standard will not be applied. An exemption is used where full relief from an airworthiness requirement or standard is required. An exemption will not necessarily create a precedent or carry forward to the next instance that the applicant experiences the same problem. The boundaries of the exemption, with respect to future design changes, should be defined in the exemption approval documents.

3. A deviation is a written authorization from the TAA to depart from an airworthiness requirement or standard, or a specified portion of the requirement or standard. In the case of a deviation, the airworthiness requirement or standard is still applicable, however the deviation allows for a change to a specific part or feature of the requirement or standard. A deviation can be permanent or temporary, as defined in the deviation approval documents.

4. Examples of possible deviation scenarios include:

   a. Acceptance of an alternate requirement or standard; or

   b. Acceptance of partial compliance towards a requirement or standard.

ADVISORY NOTE

Deviations from the approved maintenance program are defined in 3.1.2.S1.

5. In addition to the approach described in this chapter, individual TAM chapters may also prescribe a means for granting relief.

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SECTION 2

RULES AND STANDARDS

5.9.2.R1 Exemption or Deviation Request

1. In order to seek an exemption or a deviation, an applicant will submit a request to the TAA that meets the requirement specified in 5.9.2.S1.

2. The TAA will conduct an assessment of each exemption or deviation request submitted by an applicant. The TAA's evaluation will be based on the full assessment of the impact on aviation safety and any associated airworthiness risk. The TAA's disposition will contain a summary of the rationale to either grant or deny the request, a statement on any imposed conditions or limitations, and the expiration of the exemption or deviation, if applicable. The TAA will provide a recommendation and forward the exemption or deviation request to the OAA for approval.

5.9.2.S1 Exemption or Deviation Request

1. An exemption or deviation request shall include:

   a. the specific technical airworthiness requirement or standard for which an exemption/deviation is requested;

   b. identification of the alternate requirement or standard being proposed (for a deviation);

   c. background to the request;

   d. rationale and supporting arguments to substantiate the request;

   e. identification of any reduction to the required level of safety;

   f. an assessment of any airworthiness risks arising from the request;

   g. proposed conditions that could mitigate any potential risks to aviation safety; and

   h. the duration of the exemption or deviation.

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SECTION 3

ADVISORY MATERIAL

NOTE

In an effort to provide Advisory Material to TAM users as rapidly as possible, all applicable Advisory Material will be published in the form of TAA Advisories, and will be posted on the DTAES websites, which are updated regularly. The Advisory Material presented in this section will eventually be converted into a TAA Advisory.

5.9.3.1 Exemption and Deviation

1. The purpose of this advisory is to describe the means and process for obtaining an exemption or a deviation.

2. The four basic steps in the exemption/deviation process are as follows:

   a. submission of an exemption/deviation request;

   b. exemption/deviation request assessment;

   c. exemption/deviation disposition; and

   d. exemption/deviation recording, tracking, and periodic review.

3. **Exemption/Deviation Request Submission.** By virtue that an exemption or a deviation grants relief from a regulatory requirement or standard, the request document must contain essential elements of both substance and form to ensure regulatory completeness. A properly substantiated application will address all topics under the following general headings:

   a. **Applicability.** The document must specify the person, organization, or equipment to which the exemption/deviation applies. Full identifying particulars are to be provided to avoid confusion.

   b. **Airworthiness Requirement.** This identifies the regulatory airworthiness requirement or standard to which relief is sought.

   c. **Rationale.** A logical argument is necessary to describe the background and indicate why it is not possible to adhere to the regulatory requirement or standard. In the case of a deviation request, alternative regulations or standards should be proposed, if possible.

   d. **Safety.** Any changes to safety associated with request are to be identified. In addition, any alternative measures, which would offset any reductions in safety should be identified and supported.

   e. **Airworthiness Risk.** This would identify any change in airworthiness risk associated with the granting of the exemption or deviation. An airworthiness risk assessment may be necessary to support this position.

   f. **Proposed Conditions and Limitations.** This is the applicant's opportunity to suggest any mitigating actions to the identified risks.

   g. **Duration.** By default, exemptions and deviations are not time limited. However, should the exemption or deviation be linked to an event, or only needed for a defined period, then such should be specified.

4. An example of an application form is shown in Figure 5-9-3-1, Technical Airworthiness Exemption/Deviation Request.

5. **Exemption/Deviation Request Assessment.** The exemption or deviation request is assessed against the following criteria:

   a. content of the request to ensure all necessary information has been provided;

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b. a determination of the following concerns:

(1) Will aviation safety be compromised?

(2) Can an equivalent level of safety be maintained by the imposition of conditions or limitations?

(3) What are the potential airworthiness risks?

(4) Are the risks acceptable?

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TECHNICAL AIRWORTHINESS EXEMPTION/DEVIATION REQUEST

Applicant File No.: _____ Regulator File No.: _____

Related Reference: _____

PART 1: APPLICATION REQUEST

1. Person/Organization/Equipment affected:

2. Airworthiness requirement involved:

3. Nature of situation and reason for request, including identification of any alternate requirement or standard:

4. Change in the level of aviation safety:

5. Changes to Airwrothiness Risk:

6. Proposed conditions, limitations or duration:

7. Originator: _____ Date: _____

PART 2: REQUEST ASSESSMENT AND DISPOSITION

8. Assessment of potential compromise to aviation safety:

9. Assessed airworthiness risk:

10. Applied conditions, limitations or period:

11. Expiration:

12. Approved: _____ Denied: _____

13. Disposition Rationale:

14. TAA Recommendation: _____ Date: _____

15. OAA Approval: _____ Date: _____

Figure 5-9-3-1 Exemption/Deviation Request

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(5) What conditions or limitations are necessary?

(6) For a deviation request, are the alternative requirements or standards being proposed acceptable?

(7) What is the duration of the exemption/deviation?

c. a review of previous exemption/deviation requests to ensure that the assessment results and proposed conditions are consistent with previous applications; and

d. existing or known trends.

6. **Exemption/Deviation Disposition.** The exemption/deviation disposition documentation should include:

a. a full assessment of the impact on aviation safety and airworthiness risk;

b. a summary of the rationale to either grant or deny the request;

c. ancillary conditions or limitations;

d. expiration date of the exemption or deviation; and

e. the formal record of approval or non-approval of the request.

7. It should be noted that the granting of an exemption or deviation relates to airworthiness safety and cannot be construed as having met all technical, configuration management, or operational reasons.

8. The approval of an exemption or deviation depends on the circumstances and the nature of the airworthiness requirement. It may require the creation of conditions and/or limitations to eliminate or mitigate the risks to aviation safety.

9. **Exemption/Deviation Recording, Tracking, and Periodic Review.** Exemptions and deviations are to be recorded and retrievable for regulatory review purposes.

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LIST OF ABBREVIATIONS

1 Cdn Air Div	1 Canadian Air Division
AA	Airworthiness Authority
AAB	Airworthiness Advisory Board
AASA	Aging Aircraft Structural Assessment
AC	Advisory Circular
ACA	Aircraft Certification Authority
ACC	Airworthiness Control Committee
ACSI	Aircraft Certification Staff Instructions
AD	Airworthiness Directive
ADM (Mat)	Assistant Deputy Minister (Material)
ADO	Acceptable Design Organization
ADSM	Airworthiness Design Standards Manual
AEO	Aircraft Engineering Officer
AEPM	Aerospace Equipment Program Management
AERE	Aerospace Engineers
AFM	Approved Flight Manual
AI	Airworthiness Inspector
AIA	Airworthiness Investigative Authority
ALOS	Acceptable Level of Safety
ALSE	Aviation Life Support Equipment
AMA	Aerospace Medical Authority
AMA	Airworthiness Manual Advisory
AME*	Aircraft Maintenance Engineer
AMfgO	Acceptable Manufacturing Organization
AMO	Acceptable Maintenance Organization
AMSO	Acceptable Materiel Support Organization
AOI	Aircraft Operating Instructions
APL*	Airworthiness Policy Letter
APM	Airworthiness Process Manual
APU	Auxiliary Power Unit
AQM	Aerospace Quality Management
ARA	Aircraft Release Authority
ARB	Airworthiness Review Board
ASIMP	Aircraft Structural Integrity Management Plan
ASIP	U.S. Air Force Aircraft Structural Integrity Program
ASL	Approved Suppliers' List
ATA	Air Transport Association of America
ATC	Air Traffic Control
ATO	Acceptable Technical Organization
ATOL	Automatic Take-off and Landing
AWACS	Airborne Warning and Control System
AWIA	Airworthiness Impact Assessment
AWL	Airworthiness Limitations
BIT	Built-in-Test
BITE	Built-in-Test Equipment
CAF	Canadian Armed Forces
CAMP	Contingency Aircraft Maintenance Program
CAP	Corrective Action Plan
CAR*	Canadian Aviation Regulations
CARAC*	Canadian Aviation Regulation Advisory Council
CCA	Configuration Control Authority
CCB	Configuration Control Board

* Terms defined by Transport Canada

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LIST OF ABBREVIATIONS (Cont)

CDL	Configuration Deviation List
CDS	Chief of the Defence Staff
CFITES	Canadian Forces Individual Training and Education System
CFTO	Canadian Forces Technical Order
CI	Configuration Item
CM	Configuration Management
CMM	Capability Maturity Model
CMP	Configuration Management Plan
CofA	Certificate of Airworthiness
CofC	Certificate of Conformance
CofR	Certificate of Registration
COLOG	Co-operative Logistics (with USDoD)
CPCP	Corrosion Prevention and Control Program
CVR	Cockpit Voice Recorder
DA	Design Authority
DAAR	Designated Airworthiness Authority Representative
DAOD	Defence Administrative Orders and Directives
DAS	DND Airworthiness Supplement
DE	Design Engineer
DEF STAN	Defence Standard (UK)
DM	Deputy Minister
DND	Department of National Defence
DoD	Department of Defense (US)
DQA	Director Quality Assurance
DSN	Design Support Network
DT	Design Technologist
DTAES	Director Technical Airworthiness and Engineering Support
ECIR	Equipment Codes and Inspection Requirements
EFP	Experimental Flight Permit
ELE	Estimated Life Expectancy
ELT	Emergency Locator Transmitter
EMC	Electromagnetic Compatibility
EME	Electromagnetic Environment
EMI	Electromagnetic Interference
EPM	Engineering Process Manual
ETOPS	Extended Twin Engine Operations
EWIS	Electrical Wiring Interconnections System
EZAP	Enhanced Zonal Analysis Procedure
FAA	Federal Aviation Administration (US)
FAC	Foreign Affairs Canada
FDI	Flight Director Indicator
FDR	Flight Data Recorder
FHA	Functional Hazard Analysis
FLIR	Forward Looking Infrared Radar
FMEA	Failure Modes and Effects Analysis
FMECA	Failure Modes Effect Criticality Analysis
FOD	Foreign Object Damage
FSCAP	Flight Safety Critical Aircraft Part
FTA	Flight Test Authority
GCS	Ground Control Station
HIRF	High Intensity Radio Frequency
ICA	Instructions for Continued Airworthiness

* Terms defined by Transport Canada

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LIST OF ABBREVIATIONS (Cont)

IFF	Identification Friend or Foe
IFR	Instrument Flight Rules
ISMP	In-service Monitoring Program
JAA	Joint Aviation Authority
LOI	Level of Involvement
MAP	Manual of Aerospace Procedures
MCM	Maintenance Control Manual
MEL*	Minimum Equipment List
MfgPM	Manufacturing Process Manual
MMEL*	Master Minimum Equipment List
MND	Minister of National Defence
MOD	Ministry of Defence (UK)
MOT	Minister of Transport
MOU	Memorandum of Understanding
MPM	Maintenance Process Manual
MRA	Maintenance Release Authority
MRB	Material Review Board
MSPM	Material Support Process Manual
MTBF	Mean Time Between Failures
MTOW	Maximum Take-off Weight
NAS	National Aircraft Standards
NATO	North Atlantic Treaty Organization
NDT	Non-destructive Testing
NVG	Night Vision Goggles
NVIS	Night Vision Imaging Systems
OAA	Operational Airworthiness Authority
OAC	Operational Airworthiness Clearance
OEI	One-engine Inoperative
OEM	Original Equipment Manufacturer
OJT	On-the-Job Training
OPI	Office of Primary Interest
OS	Occupation Specification
OSI	Out of Sequence Inspection
OSS	Occupation Speciality Specification
PCA	Product Conformance Authority
PHST	Packaging, Handling, Storage and Transport
PIF	Pre-installation Failure
PMA	Parts Manufacturing Approval
PMO	Project Management Officer
POL	Petroleum, Oil and Lubricant
PRAA	Person Responsible for Assignment of Authority
PTAC	Provisional Technical Airworthiness Clearance
R&D	Repair and Disposal
R&D	Research and Development
RARM	Record of Airworthiness Risk Management
RCA*	Restricted Certification Authority
RF	Radio Frequency
RNAV	Area Navigation
RNP	Required Navigation Performance
RTC	Restricted Type Certificate
RTCA	Radio Technical Commission for Aeronautics
RTCDS	Restriced Type Certificate Data Sheet
RTS	Release to Service
SAE	Society of Automotive Engineers
SAI*	Senior Airworthiness Inspector

* Terms defined by Transport Canada

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LIST OF ABBREVIATIONS (Cont)

SAMA	Senior Aircraft Maintenance Authority
SAMEO	Squadron Aircraft Maintenance and Engineering Officer
SCA	Shop Certification Authority
SDE	Senior Design Engineer
SEI	Software Engineering Institute
SI	Special Inspection
SMfgM	Senior Manufacturing Manager
SMM	Senior Maintenance Manager
SMSM	Senior Material Support Manager
SOI	Statement of Operating Intent
SOR	Statement of Operational Requirement
SOW	Statement of Work
SPFP	Specific Purpose Flight Permit
SSA	System Safety Assessment
SSE	Safe Single Engine
SSI	Structural Significant Item
STC	Supplemental Type Certificate
STOL	Short Take-off and Landing
TAA	Technical Airworthiness Authority
TAC	Technical Airworthiness Clearance
TAM	Technical Airworthiness Manual
TAO	Temporary Authority to Operate
TAWD	Technical Airworthiness Data
TC*	Transport Canada
TCAS	Traffic and Collision Avoidance System
TCCA*	Transport Canada Civil Aviation
TCDS	Type Certificate Data Sheet
TCH	Type Certificate Holder
TDE	Type Design Examination
TIES	Technical Investigation and Engineering Support
TOR	Terms of Reference
TSN	Time Since New
TSO	Technical Standard Order
UA	Unmanned Aircraft
UAS	Unmanned Aircraft Systems
UAV	Uninhabited Air Vehicle
UCR	Unsatisfactory Condition Report
UCS	UAS Control Station
UK	United Kingdom
ULD	Underwater Locating Device
US	United States
VFR	Visual Flight Rules
VNE	Velocity Not to Exceed
WCAS	Warning, Caution and Advisory System
WFD	Widespread Fatigue Damage
WSM	Weapon System Manager

* Terms defined by Transport Canada

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GLOSSARY

Click on a link

A	B	C	D	E	F	G	H	I	J	K	L	M
N	O	P	Q	R	S	T	U	V	W	X	Y	Z

A

Acceptable Design Organization (ADO)

An organization deemed Acceptable by the TAA to perform airworthiness management roles and Technical Airworthiness Functions in the development of the design of Aeronautical Products, subsequent design changes to an Approved Type Design or provision of engineering support to Aeronautical Products.

Acceptable Level of Safety (ALOS)

The minimum safety goals established by the Regulator, generally defined in terms of the probability of an aircraft accident occurring. The ALOS for an aircraft is defined as the design safety goals and requirements for the aircraft Type Design. These design goals are defined in the certification requirements, standards and criteria specified in a Certification Basis. Since the Certification Basis for a specific Type Design may be unique, the detailed ALOS for that type may also be unique. The Regulator's approval of the Certification Basis declares that the Level of Safety specified in the certification requirements is 'Acceptable'. Any subsequent changes to the Certification Basis may cause changes to the ALOS levels.

Acceptable Maintenance Organization (AMO)

An organization deemed Acceptable by the TAA to perform Airworthiness Management Roles and Technical Airworthiness Functions in the conduct of maintenance and/or repair and overhaul of Aeronautical Products.

Acceptable Manufacturing Organization (AMfgO)

An organization deemed Acceptable by the TAA to perform Airworthiness Management Roles and Technical Airworthiness Functions in the manufacturing of Aeronautical Products.

Acceptable Materiel Support Organization (AMSO)

An organization deemed Acceptable by the TAA to perform Airworthiness Management Roles and Technical Airworthiness Functions in the conduct of materiel support of Aeronautical Products.

Acceptable Means of Compliance (AMC) (see also Means of Compliance)

Processes and standards recognized by the Regulator as suitable for demonstrating Compliance with an airworthiness requirement. AMCs are issued by the Regulator, but are not normally mandatory. The Applicant may propose to use other means to show Compliance with the applicable requirement.

Acceptable Technical Organization (ATO)

An organization deemed Acceptable by the TAA to perform Airworthiness Management Roles and Technical Airworthiness Functions in the conduct of the life cycle materiel management of an approved Aeronautical Product type.

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Accreditation

A process that permits or approves an organization to assign technical airworthiness authority to competent individuals who perform Airworthiness Management Roles and/or conduct Technical Airworthiness Functions within the organization. Accreditation is required for organizations that do not hold any existing approvals from other regulatory bodies. Organizations are deemed Accredited when they have demonstrated compliance with the applicable requirements of the Technical Airworthiness Manual (TAM).

Advisory Material

Documentation that offers interpretation of Technical Airworthiness Rules and Standards to assist in understanding and implementation. It also provides guidance on methods and procedures that are in compliance with Technical Airworthiness Rules and Standards. Advisory material, including the described methods and procedures, is not mandatory and organizations may choose to follow other means of demonstrating Compliance.

Aeronautical Product

Any aircraft, aircraft engine, aircraft propeller, aircraft appliance or the component parts of any of those things including computer systems and software.

Aeronautics Act

The authoritative document for both civil and military aviation safety in Canada. As a statute of Canada, the Act is a law that places upon the Minister of Transport (MOT), the Minister of National Defence (MND) and the Chief of Defence Staff (CDS) under the direction of the MND, the responsibility for the development and regulation of aeronautics and the supervision of all matters related to aeronautics.

Aeronautics Regulations

Laws issued by the Governor in Council, which amplify the provisions of the *Aeronautics Act*.

Aircraft

An aeroplane, helicopter or other machine capable of flight.

Aircraft Certification Authority (ACA)

An individual authorized to sign a Maintenance Release in respect of work performed on an aircraft.

Aircraft Release

A certification by an Authorized Individual that an aircraft is in conformance with the applicable Approved Type Design following the performance of maintenance, servicing or elementary work, and it is safe for release to operations. Aircraft Release is a Technical Airworthiness Function, also called Weapon System Release within RCAF maintenance policy.

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Aircraft Release Authority (ARA)

An individual authorized in accordance with TAA-approved procedures to conduct the Technical Airworthiness Function of Aircraft Release.

Aircraft Store (see Store)

Airworthiness

A standard of safety for an Aeronautical Product demonstrating that it is Fit and Safe for Flight, in conformance with its Approved Type Design, manufacturing and maintenance standards and operated within its design limits.

Airworthiness Approval

A certification by an Authorized Individual that a Type Design, or Design Change to an Approved Type Design, is in compliance with the Certification Basis. Airworthiness Approval is a Technical Airworthiness Function.

Airworthiness Authority (AA)

A generic term for any of the following: aviation regulatory agency (or authority), aviation safety authority, National Aviation (or Airworthiness) Authority (NAA), Civil Aviation (or Airworthiness) Authority (CAA), or Military Aviation (or Airworthiness) Authority (MAA). The DND/CAFAA is the person designated in writing by the Minister of National Defence (MND) through the Chief of Defence Staff (CDS) to have overall supervision and management of the DND/CAF Airworthiness Program and acts as Chair of the Airworthiness Advisory Board (AAB). That person is the Commander of the RCAF. The Commander's responsibilities include the development, promotion, supervision and management of the Airworthiness Program for the DND/CAF, the nomination of competent individuals to fill the roles of Operational and Investigative Airworthiness Authorities and, in consultation with ADM(Mat), the nomination of a competent individual to fill the role of Technical Airworthiness Authority.

Airworthiness Clearance

A certification issued by the AA that the requirements of the airworthiness program have been met and that, from an airworthiness perspective, a specific Aeronautical Product is ready to enter into operational service.

Airworthiness Code

A comprehensive set of airworthiness design and certification requirements that define those attributes of aircraft systems or equipment required for safe flight. These requirements are used to develop a Certification Basis that defines the attributes of an aircraft Type Design that underpin safe flight and thus an Acceptable Level of Safety for the operation of the aircraft. Airworthiness codes are issued by civil and military Airworthiness Authorities for a range of aircraft categories, e.g., transport, rotorcraft and Unmanned Aircraft Systems (UAS). Examples of Airworthiness Codes include the European Aviation Safety Agency Certification Specifications (CSs), Transport Canada Canadian Aviation Regulations (CARs), the U.S.Federal Aviation Regulations (FARs), the U.S. Department of Defence Mil-Hdbk-516 and the European Defence Agency European Military Airworthiness Certification Criteria (EMACC).

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Airworthiness Design Standard (see Design Standard and Certification Standard)

Airworthiness Directive (AD)

An product-related airworthiness order issued by the TAA when mandatory action is necessary to rectify a potential degradation in the level of safety for in-service Aeronautical Products.

Airworthiness Documentation

The documentation required to satisfy the traceability and information requirements for both the Approved Type Design and in-service Aeronautical Products.

Airworthiness Impact Assessment (AWIA)

A structured argument, supported by evidence, intended to justify that an aircraft, Aeronautical Product or UAS meets an Acceptable Level of Safety.

Airworthiness Investigative Authority (AIA)

The person responsible for the regulation of the airworthiness aspects of the Flight Safety Program for the DND/CAF. The DND Chief of Defence Staff, under the direction of the Minister of National Defence, has delegated the Director Flight Safety (DFS) to fill the position of AIA. The AIA is also responsible for the investigation of airworthiness-related occurrences and for the monitoring of the Technical and Operational Airworthiness Programs to identify deficiencies.

Airworthiness Limitations (AWL)

Limitations applicable to an Aeronautical Product, in the form of a life limit or a maintenance task that is mandatory as a condition of the Type Certificate.

Airworthiness Management Role

A role or responsibility that is conferred upon an individual within an Acceptable Organization to ensure that the organization complies with applicable airworthiness rules and standards during the conduct of airworthiness-related activities. This role may or may not include the Assignment of Authority to perform Technical Airworthiness Functions and it is called Senior Design Engineer (SDE) for an Acceptable Design Organization and Acceptable Technical Organization, Senior Maintenance Manager for an Acceptable Maintenance Organization, Senior Manufacturing Manager for an Acceptable Manufacturing Organization and Senior Materiel Support Manager for an Acceptable Materiel Support Organization.

Airworthiness Process Manual (APM)

The primary means for an organization to document its compliance with the airworthiness rules and standards of the TAM. It must describe the processes utilized by an organization to govern the performance of airworthiness-related activities and define the scope and depth of technical airworthiness authority assigned to the organization by the TAA.

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Airworthiness Program

A combination of aviation activities including the design, manufacture, maintenance, material support, facilities, personnel and operations which contribute to a safe and acceptable level of aeronautical product operation.

Airworthiness Program - Investigative (see Investigative Airworthiness Program)

Airworthiness Program - Operational (see Operational Airworthiness Program)

Airworthiness Program - Technical (see Technical Airworthiness Program)

Airworthiness - Operational (see Operational Airworthiness)

Airworthiness - Technical (see Technical Airworthiness)

Airworthiness - DND/CAF Program (see DND/CAF Airworthiness Program)

Airworthiness-related Activities

Any duties, tasks or functions that may affect the Airworthiness of an Aeronautical Product.

Airworthiness Review

An optional examination by independent and qualified personnel to ensure all technical airworthiness aspects have been adequately addressed before a decision is made in performing a Technical Airworthiness Functions.

Airworthiness Review Board (ARB)

A board co-chaired by the TAA and the OAA established to:

a. manage the interface between Operational and Technical Airworthiness of each aircraft type;

b. recommend the Airworthiness Clearance of new types to the AA and approve the Airworthiness Clearance of significantly modified aircraft types;

c. conduct an annual review of the Airworthiness Clearance of all in-service aircraft types; and

d. address observations and concerns raised by the AA, AIA, Aerospace Medical Authority (AMA) and Flight Test Authority (FTA).

The ARB normally meets on a biannual basis or as the situation requires.

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Airworthiness Rule

The term used by the TAA, in the Technical Airworthiness Program, in place of the term 'Airworthiness Regulation'. Under the Canadian Federal Government's legal system, the term 'regulation' is reserved for regulations that have Order-in-Council approval. Unlike Transport Canada Civil Aviation regulations, the DND Airworthiness Requirements do not go through the Order-in-Council approval process. Instead, they are issued as rules under the authority vested in the MND and CDS.

Airworthiness Standard

The criteria and/or processes used in assessing or demonstrating compliance with an airworthiness rule.

Airworthy

The state of an Aeronautical Product when it has been assessed or determined to conform to the Approved Type Design and declared Fit and Safe for Flight.

Alteration

A non-physical change to the authorized configuration or design operating limits in the Approved Type Design of an Aeronautical Product and does not involve revisions to the drawings describing the Aeronautical Product.

Alternative Means of Compliance (AltMoC)

An alternative to an existing Acceptable Means of Compliance (AMC) associated with an Airworthiness Requirement. Since AMCs are non-binding, regulated entities may propose an alternative means to demonstrate Compliance with the requirement. In this case, however, they lose the presumption of Compliance provided by the AMC and need to gain the approval of the Regulator.

Appliance

Any instrument, mechanism, equipment, apparatus or accessory that is used, or intended to be used, in operating or controlling an aircraft in flight; installed in or attached to, or intended to be installed in or attached to, the aircraft; and not part of the airframe, engine or propeller of that aircraft.

Applicant

The regulated entity (organization's representative individual) that is applying to the Technical Airworthiness Authority for an airworthiness certificate, accreditation or other form of airworthiness approval. For a DND Type Certificate, the Applicant is the organization (or representative individual) applying for the Type Certificate (typically a Project Management Office (PMO)), or, in the case of an in-service design change, for Airworthiness Approval (typically the TCH organization).

Approved Flight Manual (AFM) (see also Flight Manual)

The Flight Manual, once Airworthiness Approval has been granted by the TAA and the OAA.

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Approved Type Design (also see Type Design, Type Design Approval)

The complete set of design data and design description documents of an Aeronautical Product that have been approved by, or on behalf of the Technical Airworthiness Authority, including the following:

a. The drawings and specifications, and a listing of those drawings and specifications, necessary to define the configuration and the design features of the Aeronautical Product shown to comply with the Certification Requirements applicable to the product;

b. Information on dimensions, material and the processes necessary to define the structural strength of the product; and

c. The Airworthiness Limitations section of the Instructions for Continuing Airworthiness (ICAs) as required by the airworthiness rules, regulations and standards.

Approved Maintenance Program

A maintenance program detailed within a suite of maintenance manuals for an Aeronautical Product, which specifies the maintenance requirements necessary for the Aeronautical Product and associated systems, equipment, component parts and software to be kept Fit and Safe for Flight.

Assignment of Authority (AoA)

The process used to authorize organizations and individuals to perform Airworthiness Management Roles and Technical Airworthiness Functions on behalf of the TAA. For organizations, the process is known as airworthiness Accreditation or Recognition. For individuals, the process is known as designation, when assigned directly by the TAA, or authorization when assigned by an authorized individual within an Acceptable Organization.

Authorized Individual (AI or TAA AI)

A person empowered, though an authorization, or Assignment of Authority (AoA) process, to perform an airworthiness function on behalf of the TAA.

Authorization

The process by which a designated or Authorized Individual within an Acceptable Organization assigns technical airworthiness authority to named individuals to perform Airworthiness Management Roles and/or Technical Airworthiness Functions on behalf of the TAA.

Aviation Life Support Equipment (ALSE)

All equipment and clothing primarily intended for the preservation of life, prevention of injury and environmental protection of aircrew and passengers during flight, emergency egress, survival and rescue.

Aviation Replacement Parts

Aviation replacement parts, including new parts, used parts, repaired parts and materials, used in the manufacture and repair of aeronautical products.

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B

No Definitions

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C

Certificate of Airworthiness (CofA)

A Technical Airworthiness document certifying that an individual aircraft meets the regulatory requirements for full flight, in that it is in conformance with the Approved Type Design and in a condition for safe operation. Unless surrendered, suspended or cancelled, the CofA remains valid for as long as the Approved Type Design remains compliant with the applicable Airworthiness Standards listed in the Certification Basis and the aircraft is in conformance with the Approved Type Design.

Certificate of Conformance (CofC)

A declaration that an Aeronautical Product is in conformity with its Approved Type Design.

Certificate of Mutilation

A document that details the identity of a mutilated Aeronautical Product, reason, date and method of mutilation, and signature of an individual authorized to perform mutilation.

Certificate of Registration (CofR)

A certificate issued by the DND/CAF TAA to certify that an aircraft has been placed on the DND Military Aircraft Register. The CofR also identifies the registered owner, the aircraft serial number and the "Identification, Friend or Foe" (IFF) address code.

Certification (see Type Certification)

Certification Basis

A set of certification requirements and associated standards against which Compliance must be demonstrated in order to obtain Airworthiness Approval for a new Type Design or a Design Change. The Certification Requirements and Standards that form the Certification Basis are extracted from the Airworthiness Codes and are tailored to suit the Aeronautical Product type. The Certification Basis may also include special conditions and environmental requirements.

Certification Plan

A document describing the intended certification process leading to TAA airworthiness approval of an Approved Type Design. It is produced by the applicant and submitted for TAA approval. The Certification Plan outlines the proposed Certification Program from the development of the proposed Certification Basis to the issuance of the DND Type Certificate.

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Certification Program

The processes, documents and activities that define the methodology followed by the Applicant and Regulator to certify a new Type Design or a design change. The program has the following four phases: 1) Development and approval of the Certification Plan and Certification Basis; 2) Establishing the Means of Compliance and the Regulator's level-of-involvement; 3) Completing the Compliance Program by reviewing compliance artefacts and making findings of compliance; and 4) Issuing the Type Certificate or granting Airworthiness Approval.

Certification Requirement (see Type Certification Requirement)

Certification Standard (see also Design Standard)

Criteria used in determining if the safety objectives expressed in the Certification Requirements have been achieved. Normally, the Certification Standards may be found in one of the following: 1) embedded directly in the certification requirements provided in Airworthiness Codes; 2) in the Acceptable Means of Compliance (AMC); or 3) in advisory material published by the Airworthiness Authority.

Civil Aviation Authority (CAA)

A country's civil authority that oversees the approval and regulation of civil aviation. Depending on how it is structured within every state, the Airworthiness Authority function may be established as a sub-component of the larger Civil Aviation Authority. The CAA may also be referred to as the National Aviation (or Airworthiness) Authority (NAA).

Compliance

A certification or confirmation that a given Type Design, Design Change, or airworthiness process meets a Technical Airworthiness Requirement and/or the Certification Basis requirement.

Compliance Artefact

The work product of a certification program that is associated with demonstrating compliance to the Certification Requirements. Examples include:

a. Design data packages (e.g., drawings, test plans/reports, analysis reports, inspection reports);

b. Functional Hazard Assessment, System Safety Assessment; and

c. Any other work products or documents that are used to make a Finding of Compliance.

Compliance Matrix

The central record in the conduct of a certification program. The Compliance Matrix contains the details of the Certification Requirements and Standards, the Means and Methods of Compliance, the Compliance Artefacts and identifies the Finding of Compliance results. When each cell of the Compliance Matrix is completed with the relevant entry, it forms the Compliance Record, which is part of the aircraft Type Record.

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Compliance Program

The processes, documents and activities that define the methodology followed by the Applicant and Regulator to demonstrate compliance with the Certification Basis for a new Type Design or design change.

Compliance Record

A completed Compliance Matrix. The Compliance Record is a component of the aircraft Type Record.

Configuration

The functional and physical characteristics of hardware, firmware and software, or a combination thereof, as set forth in technical documentation and achieved in an Aeronautical Product.

Configuration Deviation List (CDL)

A regulator-approved list which allows operation of the aircraft with minor structural components missing. This list is normally placed in the Approved Flight Manuel as an appendix.

Configuration Item (CI)

An aggregation of hardware and/or software that satisfies an end use function, and is designed for configuration management control. It is the Aeronautical Product controlled under the configuration management process and may be called a hardware CI (HWCI) or computer software CI (CSCI).

Configuration Management (CM)

The discipline that applies technical and administrative direction and surveillance on the configuration(s) and changes to the configuration(s) of Aeronautical Products throughout their life cycles. The CM process consists of the following essential elements: configuration identification, configuration control, configuration status accounting, and configuration audits.

Continued Airworthiness

Those Airworthiness Requirements, processes and activities necessary to implement Design Changes to the Type Design and verify that the conditions under which a Type Certificate has been granted continue to be fulfilled.

Continuing Airworthiness

Those Airworthiness Requirements, processes and activities necessary to ensure that Aeronautical Products continue to meet the appropriate airworthiness rules and standards throughout their operating life. Continuing airworthiness is an integral part of the day-to-day management and monitoring of an Approved Type Design and the associated Aeronautical Products after a Type Certificate has been issued. Compliance with Airworthiness Standards during the in-service period ensures that the initial inherent safety of the Approved Type Design and the actual Aeronautical Products are maintained throughout the product life cycle.

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Corrective Action

The action undertakento eliminate the cause of a detected non-conformity or other undesirable situation.

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D

Delegation

The process whereby the CDS, under the direction of the MND, assigns airworthiness authority to the positions of AA, TAA, OAA and AIA, in accordance with the terms of the *Aeronautics Act*.

Design Authority (DA)

An organizational role associated with the Original Equipment Manufacturer (OEM) of an Aeronautical Product. The DA will have the in-depth competency and comprehensive technical data related to the Approved Type Design; it is normally the only organization capable of performing a full assessment of the design and thus providing or recommending Airworthiness Approval for any subsequent Design Changes.

Design Certification Board (DCB)

A body consisting of TAA representatives tasked to review certification activities and airworthiness documentation with the intent of providing the TAA with a recommendation for Airworthiness Approval of the proposed Type Design.

Design Change

The act of making a change to the Approved Type Design of an Aeronautical Product. Design Changes include modifications, alterations, changes to the Approved Maintenance Program and changes to the approved role, mission and/or task.

Design Engineer (DE)

An individual within an ATO or an ADO who has been assigned technical airworthiness authority by the organization's SDE, or by another authorized individual, to conduct Technical Airworthiness Functions such as Findings of Compliance, granting of Airworthiness Approval, Technical Airworthiness Clearance (TAC) and Flight Authority.

Design Standard (see also Certification Standard)

A standard published by a civilian or military standards body for use in the design of aircraft, such as, for example, US MIL STD, or RTCA standard. These are normally ‘chosen’ by the design organization to achieve the design functional objectives, as well as the intended airworthiness objectives.

Designation

The process by which the TAA assigns technical airworthiness authority to named individuals to perform airworthiness management roles and/or Technical Airworthiness Functions on behalf of the TAA.

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Deviation

A written authorization to depart from an Airworthiness Requirement or an Airworthiness Standard, or a specified portion of the requirement or standard. The Airworthiness Requirement or Standard is still applicable; however, the deviation allows for a change to a specific part or feature of the requirement or standard. A deviation can be permanent or temporary, as defined in the deviation approval documents.

Deviation from the Approved Maintenance Program

A limited, one-time change to the Approved Maintenance Program (APM), which may include part substitutions, shelf-life extensions, alternate maintenance procedures, extensions to the maintenance schedule, temporary repairs, deviations from the Minimum Equipment List or the deferral of rectifications. An approved deviation from the AMP is recorded in the Technical Record for the Aeronautical Product.

Disposal Organization

An organization acceptable to the TAA to carry out the disposal of military Aeronautical Products.

Disposal Record

A document detailing the product identification, reason, date and method of disposal of an Aeronautical Product, the receiving organization, as well as the certificate of mutilation.

DND/CAF Airworthiness Policy

A policy document outlining the DND/CAF Airworthiness Program requirements, airworthiness regulatory responsibilities and key program definitions. It is issued by the Chief of Defence Staff (CDS) and the Deputy Minister (DM) as a Defence Administrative Order and Directive (DAOD).

DND/CAF Airworthiness Program

The DND/CAF military airworthiness policy document that regulates all aspects of the Canadian military aviation activities, facilities and services to ensure and maintain the Airworthiness of Aeronautical Products and provide for the safe operation of those products. The document is issued and maintained under the authority of the Chief of Defence Staff as a Canadian Forces Technical Order, under the NDID number A-GA-005-000/AG-001.

DND Type Certificate

A Type Certificate issued by the DND/CAF Technical Airworthiness Authority (see **Type Certificate**)

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Due Regard

While there is no standard definition of “due regard”, the term appears in The Chicago Convention (or the Convention on Civil Aviation, to which Canada is a signatory, and which establishes rules of airspace, aircraft registration and safety, and details the rights of the signatories in relation to air travel) in the context of operational situations that do not lend themselves to ICAO standards and flight procedures, such as politically sensitive missions, military contingencies or classified missions. According to the Convention, “States undertake, when issuing regulations for their state aircraft (i.e., Military, customs or police aircraft), that they will have **due regard** for the safety of navigation of civil aircraft.” For example, crews operating with “due regard” may not be obliged to communicate with air traffic control (ATC), which makes their intentions unknown to ATCs. As a result, this prerogative compels the authorized state aircraft commander to:

a. Separate their aircraft from all other air traffic; and

b. Operate under at least one of the following conditions:

(1) In visual meteorological conditions (VMC);

(2) Within radar surveillance and radio communications of a surface radar facility;

(3) Be equipped with airborne radar that is sufficient to provide separation between their aircraft and any other aircraft they may be controlling and other aircraft; or

(4) Operate within Class G airspace.

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E

Elementary Work

A simple maintenance task documented within the Approved Maintenance Program for an Aeronautical Product type. The consequences of an individual's inadequate performance of elementary work will have no more than a negligible impact on the airworthiness of an Aeronautical Product. When completed, elementary work does not require the airworthiness certification of maintenance release.

Engineering Process Manual (EPM)

The name given to the Airworthiness Process Manual within a TAA-Acceptable Design Organization (ADO) or a TAA-Acceptable Technical Organization (ATO).

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Equivalent Level of Safety (ELOS)

A level of safety that is approximately equal to that defined in a Certification Requirement or a Certification Standard. The demonstration of ELOS may employ qualitative or quantitative means that differ from those specified in the standard. ELOS is normally used during a Certification Program, when literal compliance with a Certification Requirement cannot be shown, and compensating factors in the design can be shown to provide a level of safety equivalent to that established by the Certification Standards. An ELOS may document a Method of Compliance that is different from what is stated in the standard, but is judged as acceptable by the TAA.

Exemption

A written authorization that allows for a specific Airworthiness Requirement or Standard not to be applied. It is used in situations where full relief from an Airworthiness Requirement or Standard is required. The boundaries of the exemption, with respect to future Design Changes, are defined in the exemption approval documents.

Experimental Flight Permit (EFP) (see Flight Permit - Experimental (EFP))

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F

Finding Authority

A person who has been authorized by the TAA, or a TAA AI, to make a Finding of Compliance.

Finding of Compliance

Finding of Compliance is a certification by an Authorized Individual that a specific element of a Type Design, or Design Change to an Approved Type Design, complies with the applicable requirements in the Certification Basis. Making a Finding of Compliance is a Technical Airworthiness Function.

Fit and Safe for Flight

The state of an aircraft when it is deemed to be in conformance with its Type Design. This requires all of maintenance to have been conducted in accordance with the Approved Maintenance Program, and all additional aircraft specific requirements (i.e., repairs, special inspections, modifications and flight permits) have been completed in accordance with the approved instructions issued by the Type Certificate Holder for the Aeronautical Product.

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Flight Authority

The term "Flight Authority" does not have a single definition that is consistently used within civil and military aviation.

a. **Civil Aviation**: Most Civil Aviation authorities use the term "Flight Authority" as a generic term that refers to either a Certificate of Airworthiness (CofA) or a Flight Permit.

b. **Military Aviation**: Within the military aviation community, the term "Flight Authority" does not have as clear a definition as the one used in civil aviation. The terms "Flight Authority", "Flight Authorization" and "Authority for Flight" are often used interchangeably. Their definition usually depends on the organization using the term and the documents it produces. Within DND, the term Flight Authority generally refers to one of the following:

(1) **Authorization for Individuals to Fly a DND Aircraft**. In this context, Flight Authority is provided via the chain of command to DND aircrew for the purpose of authorizing specific missions or tasks.

(2) **Certification that a DND Aircraft is Safe for Flight**. In this context, the term Flight Authority is used as a generic term to refer to specific processes or approvals that are used to control and ensure that DND aircraft are Airworthy and in a condition for safe operation. Within the DND Technical Airworthiness Program, some of the elements that may be grouped under the term Flight Authority include:

(a) Certificate of Airworthiness (CofA);

(b) Flight Permit (also referred to as a Temporary Flight Authority);

(c) Aircraft Release (refer to*Aircraft Release Authority*); and

(d) Technical Airworthiness Clearance (TAC).

Flight Manual

A technical document, normally provided by the Original Equipment Manufacturer, which contains the Technical Airworthiness Data (TAWD). A typical Flight Manual would contain operating limitations, Normal/Abnormal/Emergency operating procedures, performance data and loading information. It is submitted to the TAA and OAA for airworthiness approval as part of the Type Certification process and, once completed, it is referred to as the Approved Flight Manual.

Flight Permit

A temporary flight authorization granted to an aircraft to operate for a specific purpose and within specified limits.

Flight Permit - Experimental (EFP)

A Flight Permit issued by the TAA to provide Fight Authority to DND/CAF-registered aircraft conducting test and evaluation flights in support of research and development, engineering flight testing and developmental flight testing.

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Flight Permit - Specific Purpose (SPFP)

A Flight Permit issued jointly by the TAA and the OAA for DND/CAF-registered aircraft to provide temporary Flight Authority when the aircraft does not meet the conditions for a Certificate of Airworthiness, but is still capable of safe flight when any required restrictions and limitations are applied. This includes the following situations:

a. Ferry flight for a damaged or unserviceable aircraft;

b. Crew training flights prior to the issue of a Type Certificate to a newly manufactured aircraft;

c. Demonstration flights of an aircraft that is not eligible for granting of Flight Authority by some other means; and

d. Other temporary purposes, given the reason is specified/justified as being in the interests of DND/CAF.

Flight Test Authority (FTA)

The designated individual who has the responsibility for ensuring that all DND/CAF flight testing in support of DND materiel acquisition, support activities and CAF operations are conducted safely and by qualified and authorized personnel, such that safety of flight concerns based on the intended operational usage of Aeronautical Products outlined in the Statement of Operational Intent are properly addressed before operational test and evaluation. Within the DND/CAF Airworthiness Program, the FTA is not considered an "Airworthiness Authority" but has the role of an airworthiness advisor.

Full Airworthiness Accreditation/Recognition Status

The status awarded to an organization following a successful airworthiness on-site audit. It confirms that the airworthiness activities of the organization are being performed in accordance with the TAA-approved process manual for the organization and associated procedures and plans.

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Granting of Flight Authority

A process by which an Authorized Individual certifies that an aircraft is airworthy and is in a condition for safe operation. Granting of flight authority is a Technical Airworthiness Function.

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I

Initial Airworthiness

TAM rules that address the following activities:

a. Type Certification of an Aeronautical Product;

b. Assignment of Authority in a Certification Program;

c. Aircraft registration and marking;

d. Manufacturing product conformance;

e. Granting Flight Authority; and

f. Technical Airworthiness Clearance (TAC).

Implementer

The person or organization who conducts aviation activities associated with the engineering, manufacture, maintenance, material support and operation of Aeronautical Products.

Instructions for Continued Airworthiness (ICA)

Maintenance instructions developed during type certification that are necessary to keep an Aeronautical Product in a condition that is Fit and Safe for Flight.

Investigative Airworthiness Program

One of the three airworthiness programs developed under the umbrella of the DND/CAF Airworthiness Program to ensure a safe operation of the Canadian military Aeronautical Products (see also **Operational Airworthiness Program** and **Technical Airworthiness Program**). The Investigative Airworthiness Program regulates the airworthiness aspects of the Flight Safety Program, monitors the Technical and Operational Airworthiness Programs for deficiencies and investigates airworthiness-related occurrences and issues. The Investigative Airworthiness Program is managed by the Director of Flight Safety, who fills the role of Airworthiness Investigative Authority.

Investigator

A person or organization normally independent from the Regulator and the Implementer who investigates airworthiness-related aviation safety occurrences and aviation safety issues. The Investigator is also empowered to investigate the role that the Regulator and Implementer may have had in any aviation occurrences. Under the DND/CAF Airworthiness Program, the Investigator is the staff of the Director of Flight Safety, who is also the Airworthiness Investigative Authority.

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Issue Paper

Documentation used during a Certification Program to document a certification issue and request that the Applicant or TAA provide a response to address the issue. Issue Papers may be iterative, but they must be closed by the TAA before issuing the Type Certificate or granting Airworthiness Approval for a design change. Issue Papers are also used to document the requirement for a Special Condition.

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M

Maintenance

The technical and supporting administrative actions necessary to keep an Aeronautical Product, its associated systems, equipment, component parts and software in a specified condition. Maintenance includes the overhaul, repair, required inspection or modification of an Aeronautical Product and the removal of a component or its installation on an Aeronautical Product. It also includes part and component storage and reactivation, but does not include elementary work or servicing

Maintenance Flight Test

A form of verification of maintenance carried out, as directed in the Approved Maintenance Program, after maintenance work that cannot be fully verified on the ground. Since flight tests are carried out in accordance with the Approved Maintenance Program, a Flight Permit is not required.

Maintenance Process Manual (MPM)

The name given to the Approved Process Manual within a TAA-Acceptable Maintenance Organization (AMO).

Maintenance Program (see approved maintenance program)

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Maintenance Release

A certification by an Authorized Individual that an Aeronautical Product is in conformance with the Approved Type Design following the performance of maintenance on an Aeronautical Product, including a maintenance task or modification embodiment. Maintenance release is a Technical Airworthiness Function.

Maintenance Release Authority (MRA)

An individual within an Accredited Maintenance Organization authorized to conduct the Technical Airworthiness Function of Maintenance Release, in accordance with the organization's TAA-approved MPM.

Major Design Change

A Design Change that has, or may have, more than a negligible effect on the airworthiness of an Approved Type Design of an aeronautical product.

Manufacturing Process Manual (MfgPM)

The name given to the Airworthiness Process Manual within a TAA-Acceptable Manufacturing Organization (AMfgO).

Manufacturing Product Conformance

A certification by an Authorized Individual that a newly manufactured Aeronautical Product is in conformance with the applicable Approved Type Design. Manufacturing Product Conformance is a Technical Airworthiness Function.

Master Minimum Equipment List (MMEL)

A TAA/OAA-approved document created specifically to regulate the dispatch of an aircraft type with inoperative equipment. The MMEL contains the conditions, limitations and procedures required for operating the aircraft with these items inoperative while maintaining the level of safety of the aircraft type dictated by the type of operation for which the aircraft was certified and the minimum standards specified in the Certification Basis. A MMEL is neither a mandatory airworthiness requirement, nor a condition of aircraft type certification.

Materiel Product Conformance

A certification by an Authorized Individual that an aviation replacement part conforms to the applicable Approved Type Design and is traceable to a manufacturer acceptable to the TAA. Materiel Product Conformance is a Technical Airworthiness Function.

Materiel Support Process Manual (MSPM)

The name given to the Airworthiness Process Manual within a TAA-Acceptable Materiel Support Organization (AMSO).

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Means of Compliance - Certification (see also Acceptable Means of Compliance)

The techniques that will be used to demonstrate the Compliance of the Type Design against each Certification Requirement identified in the Certification Basis. The three basic means are: test, analysis and description.

Methods of Compliance - Certification

Detailed information about the methodology that will be used to demonstrate Compliance. Methods of Compliance should include the specific conditions required to demonstrate Compliance, critical assumptions, pass/fail criteria, specific levels of performance that must be attained and any other information required to describe the process used to demonstrate compliance.

Military Airworthiness Authority (MAA)

The military authority of a state normally responsible for the airworthiness of the military aircraft of that State. The Canadian MAA is headed by an AA supported by an Operational Airworthiness Authority (OAA), an Airworthiness Investigative Authority (AIA) and a Technical Airworthiness Authority (TAA). Other military regulators may use different terminology and have other organizational structures, for example: the UK Ministry of Defence (MoD) MAA is referred to as the Military Aviation Authority.

Minor Design Change

A design change that has a negligible effect on the Airworthiness of the Approved Type Design of an Aeronautical Product.

Modification

A change to the authorized configuration of the Approved Type Design of an Aeronautical Product. Typical examples are component changes, equipment additions, or software changes, and often involve a revision to the drawings and support documentation.

Mutilation

The process used to render a part unusable and non-repairable prior to disposal. Actions, such as drilling, grinding, cutting, melting or other appropriate means are used on the Aeronautical Product to the extent necessary to preclude the possibility of it being restored and returned to service.

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O

Operational Airworthiness

A standard of safety for air operations and Aeronautical Products as they relate to flying operations. The term applies collectively to all operational aspects of airworthiness-related flying operations (including aerospace control, aircraft utilization, operator training and proficiency) in addition to Compliance with airworthiness policies, regulations, orders and standards.

Operational Airworthiness Authority (OAA)

The person responsible for the regulation of the airworthiness aspects of the Operational Airworthiness Program and the regulation of all flying operations for the DND/CAF. The Chief of Defence Staff, under the direction of the Minister of National Defence, has delegated the Commander of 1 Canadian Air Division (1 Cdn Air Div) to fill the role of OAA. The OAA's responsibilities include the regulation and oversight of operational procedures, flight standards, operator training, qualification and licensing, aerospace control operations and operational airworthiness clearance of Aeronautical Products prior to operational service.

Operational Airworthiness Clearance (OAC)

A certification issued by the OAA to declare that the operational requirements of the airworthiness program have been met and that from an operational airworthiness perspective the Aeronautical Product is ready to enter operational service.

Operational Airworthiness Program

One of the three airworthiness programs developed and managed under the umbrella of the DND/CAF Airworthiness Program to ensure a safe operation of the Canadian military Aeronautical Products (see also **Investigative Airworthiness Program** and **Technical Airworthiness Program**). The Operational Airworthiness Program regulates the operational aspects of military aviation safety and provides for an acceptable level of safety for the operation of Aeronautical Products in compliance with the applicable rules and standards.

Operational Airworthiness Requirements

All policies, rules and regulations issued and published by the Operational Airworthiness Authority.

Organizational Record

A record that describes and/or supports the airworthiness-related actions or decisions made by Authorized Individuals employed within the organization regarding the state of Airworthiness of a specific Type Design or Aeronautical Product but does not fall within the definitions of either a Type Record or a Technical Record.

Original Certification Authority (OCA)

The Airworthiness Authority (AA) who ensured the oversight for the original Certification Program and issued the Type Certificate for an aircraft type or the Airworthiness Approval for a Design Change.

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P

Person Responsible for the Assignment of Authority (PRAA)

A person within an AMO or AMfgO who is appointed by the SMM or SMfgM to be responsible for the assignment of technical airworthiness authority to other individuals to conduct Technical Airworthiness Functions. In this airworthiness role, the PRAA is an authorized representative of the TAA.

Preventive Action

The action to eliminate the cause of a potential non-conformity or other undesirable situation.

Provisional Accreditation/Recognition

The status that the TAA may elect to grant to an organization whennot all requirements of the TAM have been satisfied, but the TAA is confident that the organization's activities will not impact the level of safety of the aircraft type being supported. Under a Provisional Accreditation/Recognition, there are limitations on the scope of work authorized and a requirement to review and re-issue the provisional status within 12 months.

Provisional Type Certificate

An interim Type Certificate, issued by the TAA, that will remain valid until full Compliance with all of the Certification Basis requirements has been demonstrated.

Provisional Technical Airworthiness Clearance (PTAC)

An interim Technical Airworthiness Clearance (TAC) that will remain valid until the full TAC requirements are fulfilled.

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Q

Quality Assurance

A part of quality management focused on providing confidence that quality requirements will be fulfilled.

Quality Control

A part of quality management focused on fulfilling quality requirements.

Quality Improvement

A part of quality management focused on increasing the ability to fulfil quality requirements.

Quality Management

The co-ordinated activities performed to direct and control an organization with regard to quality.

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Quality Management System

The management system used to direct and control an organization with regard to quality.

Quality Plan

A document that specifies which procedures and associated resources shall be applied to a specific project, product, process or contract, as well as by whom and when.

Quality Planning

A part of quality management focused on setting quality objectives and specifying necessary operational processes and related resources to fulfil quality objectives.

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R

Registration

The formal recording by the TAA of individual aircraft on the military aircraft register and the assignment of a tail number.

Regulate

A means to control airworthiness-related activities by rule.

Regulator

An individual or organization responsible for the development and enforcement of rules and standards for the design, manufacture, maintenance, materiel support and operation of aeronautical products.

Restricted Type Certificate (RTC)

A document issued by the TAA to declare that a particular UAS Type Design is acceptably safe to operate within its defined roles, environment and limitations. A RTC is issued to UAS when operating only in restricted airspace, in a Theatre of Operations or over international waters under Due Regard.

Rule Making

A formal process to ensure all Airworthiness Requirements included in DND Airworthiness Rules and/or Standards are reasonable and applicable prior to issue.

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S

Scrap

Scrap is material that has no real value except for its basic material content.

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Senior Design Engineer (SDE)

The TAA-designated individual responsible for all airworthiness-related activities conducted within an Acceptable Design Organization or within an Acceptable Technical Organization.

Senior Maintenance Manager (SMM)

The TAA-designated individual responsible for all airworthiness-related activities conducted within an Acceptable Maintenance Organization (AMO).

Senior Manufacturing Manager (SMfgM)

The TAA-designated individual responsible for all airworthiness-related activities conducted within an Acceptable Manufacturing Organization (AMfgO).

Senior Materiel Support Manager (SMSM)

The TAA-designated individual responsible for all airworthiness-related activities conducted within an Acceptable Materiel Support Organization (AMSO).

Servicing

All activities related to the cleaning, lubricating and fluid replenishment for an Aeronautical Product that do not require the disassembly of the product.

Shop Certification Authority (SCA)

An individual authorized to sign a Maintenance Release in respect of work performed on an Aeronautical Product while not installed on an aircraft.

Special Condition

Conditions imposed by a Regulator when an Airworthiness Code does not have suitable Certification Requirements for a new or novel design to be certified. In this situation, the Regulator can add a new requirement to the Certification Basis by approving and issuing a special condition.

Specific Purpose Flight Permit (see Flight Permit - Specific Purpose (SPFP))

Statement of Operating Intent (SOI)

A document which identifies the intended roles, missions, tasks and in-service usage of the proposed Aeronautical Product Type Design in sufficient detail to permit an engineering analysis and an assessment to determine and apply the appropriate Airworthiness Standards.

Store (Aircraft Store)

Any device intended for internal or external carriage and mounted or placed on aircraft suspension or release equipment, whether or not the device is intended to be separated in flight from the aircraft.

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Stores Clearance

The determination of specific store(s)/aircraft compatibility and the formal publication of all technical and operational instructions necessary for preparation, loading, maintenance and employment of a store on a specified aircraft.

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T

TAM Rule (see Technical Airworthiness Rule)

TAM Standard (see Technical Airworthiness Standard)

Technical Airworthiness

A standard of safety for an Aeronautical Product as it relates to product design, manufacture, maintenance and material support. The term applies collectively to those technical airworthiness aspects of the product's Conformity with its Approved Type Design, manufacture, maintenance standards and operated within its design limits.

Technical Airworthiness Authority (TAA)

The person responsible for the regulation of the technical airworthiness aspects of the design, manufacture, maintenance and materiel support of Aeronautical Products and the determination of the airworthiness acceptability of those products prior to operational service. The CDS, under the direction of the MND, has delegated the Director General – Aerospace Equipment Program Management (DGAEPM) as the TAA for the DND/CAF. In turn, the DGAEPM assigns this responsibility to the Director – Technical Airworthiness and Engineering Support (DTAES), whose regulatory staff performs the day-to-day management of the Technical Airworthiness Program.

Technical Airworthiness Clearance (TAC) (see also Provisional Technical Airworthiness Clearance (PTAC))

A certification by the TAA or an Authorized Individual that the technical requirements of the airworthiness program have been met and that, from a technical airworthiness perspective, a specific Aeronautical Product is ready to enter operational service.

Technical Airworthiness Data (TAWD)

The information and data contained in the Type Record that is required to safely operate the aircraft throughout its approved envelope.

Technical Airworthiness Function

A mandatory airworthiness certification performed by an Authorized Individual on behalf of the TAA, as required by the applicable airworthiness rules and standards, in the conduct of airworthiness-related activities.

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Technical Airworthiness Program

One of the three airworthiness programs developed and managed under the umbrella of the DND/CAF Airworthiness Program to ensure a safe operation of the Canadian military Aeronautical Products (see also **Investigative Airworthiness Program** and **Operational Airworthiness Program**). The Technical Airworthiness Program regulates the technical aspects of military aviation safety and provides for an Acceptable Level of Safety for Aeronautical Products in compliance with the applicable design, manufacturing, maintenance and materiel support rules and standards.

Technical Airworthiness Rule

A form of Technical Airworthiness Requirements, published in the TAM as rules. The TAA regulates by issuing Technical Airworthiness Rules and Standards.

Technical Airworthiness Standard

A standard of Technical Airworthiness published in the TAM directly linked to a specific TAM rule. The TAA regulates by issuing Technical Airworthiness Rules and Standards.

Technical Record

A set of documents that describes the state of Airworthiness of a particular Aeronautical Product and must be maintained throughout the life cycle of the Aeronautical Product. The documents in a technical record generally fall into one of the following sub-categories:

a. In-service product certification documentation, including Maintenance Release records, aircraft release records, Flight Authority records and Certificates of Conformance; and

b. Product status documentation, including operating records, maintenance records, configuration status data, airworthiness directive records and product-related deviations/waivers.

Trash

Aeronautical Product that has no repair potential and no potential value through future use or resale.

Type Certificate (see also Provisional Type Certificate)

A document issued by the Airworthiness Authority to confirm that it has certified a particular Type Design. The Type Certificate includes, or provides references to, the Type Design data, the Type Certificate Data Sheet (TCDS), the Certification Basis and any other conditions or limitations prescribed by the Airworthiness Authority. Within the DND/CAF Airworthiness Program, these documents are called ‘DND Type Certificates’. DND Type Certificates issued before 1998 were called ‘Canadian Military Aircraft Type Certificate (CMATC)’.

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Type Certificate Holder (TCH)

An organizational role established within the Technical Airworthiness Program. The TCH organization is accountable to the TAA for ensuring that, when placed on the DND Aircraft Register, an Aeronautical Product meets all continuing airworthiness requirements stipulated within the TAM. This normally involves the management of the in-service engineering support, maintenance support, materiel support and disposal of aeronautical products. The TCH is normally the only organization with sufficient visibility and control over all aspects of an aeronautical product's design, manufacture, maintenance and materiel support to provide or recommend a Technical Airworthiness Clearance (TAC) for a design change to an approved type design. The TCH for an Aeronautical Product would normally require accreditation by the TAA as an Acceptable Technical Organization (ATO).

Type Certification

A process that includes all of the steps and activities required to complete a Certification Program and issue a Type Certificate. The process has four stages as follows:

a. Certification Plan and Certifications Basis;

b. Establishing Methods of Compliance and Regulator level of involvement;

c. Demonstrating and Recording Compliance; and

d. Type Certificate Issuance.

Type Certification Requirements

The Airworthiness Requirements published by the Regulator that are related to the Certification of a Type Design.

Type Certification Basis (see Certification Basis)

Type Design

A description of all characteristics of an Aeronautical Product, including its design description data, limitations, and Instructions for Continued Airworthiness (ICA).

Type Designation

A series of letters and numbers that are used for the identification of a DND/CAF aircraft type. An aircraft Type Designation shall consist of a prefix letter “C”, a second letter indicating the primary role of the aircraft and a three-digit numeric.

Type Design Approval

The release of a certificate by, or on behalf of an airworthiness authority, to signify approval of a type design.

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Type Design Examination (TDE)

A process that is used to establish the amount of credit that will be given to previous certification work of other organizations. TDE normally consists of a TAA staff review of the design and certification data that show compliance with the Certification Basis of the original aircraft. This credit may be applied, in whole or in part, towards obtaining Airworthiness Approval. The TDE process does not grant any Airworthiness Approvals.

Type Record

A set of documents that describes the state of Airworthiness for a particular Aeronautical Product Approved Type Design and must be maintained throughout the life of the Type Design. The documents in a Type Record generally fall into one of the following sub-categories:

a. Initial type certification documentation, including Approved Type Design description, Certification Basis, Airworthiness Limitations, Compliance Record and associated substantiating data, and approved publication;

b. In-service design certification documentation, including Design Changes to the Approved Type Design, deviations and waivers and authorized changes to the approved configuration; and

c. Miscellaneous documentation, including design-related quality deficiency reports, flight safety occurrence reports and technical investigations.

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Unmanned Aircraft (UA)

An aircraft that is designed to operate with no human pilot on board and which does not carry personnel. Moreover, a UA is:

a. capable of sustained flight by aerodynamic means;

b. remotely piloted, or automatically flies a pre-programmed flight profile;

c. reusable; and

d. not classified as a guided weapon or similar one shot device designed for the delivery of munitions.

Unmanned Aircraft System (UAS)

An Unmanned Aircraft System is comprised of individual UA System elements, consisting of the Unmanned Aircraft (UA), the UA Control Station (UCS) and any other UA System elements necessary to enable flight, such as a command and control data link, communication system and take-off and landing element. There may be multiple UA, UCS, or take-off and landing elements within a UAS.

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