Occupational Health and Safety Tribunal Canada

Tribunal de santé et sécurité au travail Canada

Ottawa, Canada K1A 0J2

Citation: *Rehab Rivers* v. *Air Canada*, 2010 OHSTC 11

Date: 2010-09-03
Case No.: 2005-12
Rendered at: Ottawa

Between:

Rehab Rivers, Appellant

and

Air Canada, Respondent

Matter:	Appeal against a decision rendered by a health and safety officer under paragraph 129(7) of the *Canada Labour Code*
Decision:	The decision is confirmed
Decision rendered by:	Mr. Michael Wiwchar, Appeals Officer
Language of decision:	English
For the appellant:	Mr. James Robbins, Counsel – Cavalluzzo Hayes Shilton McIntyre & Cornish LLP
For the respondent:	Ms. Rhonda Shirreff, Counsel – Heenan Blaikie LLP

REASONS

[1] This is an appeal brought under ss. 129(7) of the *Canada Labour Code* (the Code) by Ms. Rehab Rivers, employee with Air Canada, regarding an oral decision of no danger rendered by Mr. Robert Gass, Health and Safety Officer (HSO), on March 15, 2005, and confirmed in writing on March 16, 2005, pursuant to ss. 129(4) of the Code.

[2] On August 31, 2007, a decision was rendered by appeals officer Pierre Guénette. The appellant made an application to the Federal Court for judicial review of the decision. Subsequently, on November 21, 2008, the Court allowed the application and the matter was referred to a different appeals officer for re-determination.

[3] The hearing into the appeal was held in Toronto, Ontario, on July 14 to 16, 2009, September 15 to 17, 2009 and February 3 and 4, 2010.

Background

[4] On March 14, 2005, Ms. Rivers occupied the position of In Charge Flight Attendant. She was scheduled for work on flight number 101 on an aircraft, Airbus model A321 (A321), departing from Lester B. Pearson International Airport in Toronto to arrive in Vancouver and then return to Toronto.

[5] That day, Ms. Rivers learned that one of the aircraft's two air packs[1] was broken and she invoked her right to refuse dangerous work. The employer contacted HSO Gass and he conducted an investigation into the work refusal.

[6] The grounds of Ms. Rivers' refusal were based on a previous incident, on July 17, 2004 when she operated an A321 aircraft under similar circumstances with one broken air pack. During that flight she became ill and experience symptoms consisting of headache, nausea, fatigue and a lack of coordination.

[7] On March 15, 2005, HSO Gass rendered his decision that a danger for Ms. Rivers did not exist. The decision report stated the following about his findings:

- the aircraft had only one air pack working (air conditioner);
- the pilot briefed the crew fully and explained the measure he was taking to compensate and provide the crew and passengers with a comfortable environment;
- flying this aircraft in this situation is legal if measures are taken to compensate;
- when crew was consulted at the conclusion of this flight by employee health and safety representatives, they reported no one suffered any adverse restrictions on this flight.

[1] An air pack is an aircraft component that pressurizes, heats and cools the cabin

Issue

[8] The issue in this case is whether HSO Gass erred in concluding that a danger did not exist for Ms. Rivers in the performance of her duties on March 14, 2005, when she exercised her right to refuse to work on an A321 aircraft with a broken air pack.

Submissions of the parties

[9] The parties submitted an agreed statement of facts from the evidence presented at the previous hearing. These facts will form part of the record for this appeal. Also, the parties agreed that the investigation of HSO Gass is irrelevant because both parties have submitted considerably more information during the hearing than that HSO Gass had to consider.

Appellant's submissions

[10] The appellant's case included the testimony of three witnesses:

- Ms. Rehab Rivers, the appellant;
- Dr. Douglas Walkinshaw, expert witness and;
- Dr. Bruce McGoveran, expert witness.

[11] Ms. Rivers testified that she had the opportunity to review the agreed statement of facts and she agreed with all the statements therein. She testified on the following topics:

- her work and training history with the employer;
- her duties which included the procedures and policies to be followed;
- the circumstances of her flight on July 17, 2004, where she suffered symptoms that she attributed to the broken air pack on the A321 aircraft;
- the circumstances on the day of her refusal on March 14, 2005;
- her physical and medical condition in general, on the day of and subsequent to the work refusal.

[12] Dr. Walkinshaw is a professional engineer and indoor air quality specialist. He gave evidence and an opinion regarding the effect that will encounter between an A321 aircraft with one broken air pack and the cabin's ventilation and the effect of ventilation reduction on contaminant levels. He did not take any measurements from the aircraft. He reviewed data provided by the manufacturer as well as his own and he reviewed related reports to Airbus and other aircrafts.

[13] Dr. McGoveran is a medical doctor and a specialist in occupational medicine. He gave evidence and an opinion on the medical basis for establishing a reasonable expectation that an air pack failure can cause the occurrence of symptoms; and whether the symptoms constituted an illness and increased the likelihood of injury.

[14] The appellant submitted that the case is about whether a broken air pack on an A321 aircraft constituted a danger within the meaning of the Code.

[15] Mr. Robbins argued that there is objective scientific evidence to explain the phenomenon experienced by Ms. Rivers on July 17, 2004, that a broken air pack would result in illness and increased likelihood of injury. The effects of a broken air pack are as follows:

- fresh air ventilation rates are brought below the minimum standard;
- it severely reduces the capacity of the air cooling system on the aircraft;
- the reduction in ventilation rates raises level of gaseous contaminants, Volatile Organic Compounds[2] (VOCs);
- expert medical evidence indicated that a poorly ventilated indoor environment can make people sick in an aircraft.

[16] Mr. Robbins submitted that there are undoubtedly flights with broken air packs where there have been no reports of symptoms, including the March 14, 2005 flight which Ms. Rivers refused to operate. Nevertheless, he stated that it has been determined that the definition of a dangerous environment under the Code does not necessarily have to result in harm on every exposure.

[17] Furthermore, there are a variety of factors, Mr. Robbins argued, which may mitigate the effects of a broken air pack that include, the type of plane, length of flight, passenger load, and ground temperature on departure. He stated that there is no doubt that a broken air pack on a A321 will drastically reduce fresh air ventilation rates and increase contaminant levels; and will therefore increase the risk of illness associated with reduced ventilation rates.

[18] In the present case, Mr. Robbins argued that there is an undisputed relationship between broken air packs and degradation of air quality both with respect to ventilation and temperature. He stated that there is an undisputed relationship between reduced ventilation and increased contaminant levels. As well, there is expert medical evidence and an established body of medical literature to the effect that reduced ventilation levels will result in symptoms including headache, fatigue, dizziness and loss of coordination.

[19] Finally, there is no credible alternative explanation, Mr Robbins submitted, for the symptoms experienced by Ms. Rivers and other persons on the July 17, 2004 flight. He stated that there is more than sufficient evidence to conclude on the basis of inference from past flights and on the basis of expert opinion that broken air packs cause those symptoms within the meaning of the definition of "danger".

Respondent's submissions

[20] The respondent's case included the testimony of two witnesses:

[2] Volatile Organic Compounds are organic chemical compounds (hydrocarbons) that have vapor pressures high enough to enable significant vaporization rates at room temperature (taken from definitions in Exhibit 5, page 9)

- Mr. C. Drennan, Fleet Manager Maintenance for Air Canada's single aisle Airbus Fleet and;
- Dr. Claude Thibeault, expert witness.

[21] Mr. Drennan testified about general mechanical information regarding the employer's Airbus aircraft fleet. His evidence was also on the maintenance process and procedures as well as repairs linked with the A321 aircraft in general and specific to broken air packs. He explained the repair reports concerning the broken air packs for the aircrafts involved in both the July 17, 2004, and March 14, 2005, incidents.

[22] Dr. Thibeault is a medical doctor and has a lengthy career in the field of aviation and aerospace medicine within the aviation and airline industry. He gave evidence and an opinion regarding the relationship between a broken air pack and the symptoms described by Ms. Rivers and; whether flying with a broken air pack in the future would result in the same or similar symptoms to those reported on July 17, 2004.

[23] The respondent submitted that the evidence clearly indicated that cabin air quality is not determined solely by ventilation. Rather, it is determined by a complex interaction of many factors, including ventilation, pressurization, contaminants, humidity and temperature. Given this complexity it was impossible to determine whether the reduced ventilation rate associated with operating the July 17, 2004 flight with a broken air pack resulted in the symptoms described by Ms. Rivers.

[24] Based on all the available evidence, Ms. Shirreff argued that it is not possible to ascertain, with any degree of certainty whatsoever, what led to the symptoms reported by Ms. Rivers on the July 2004 flight. Even if it is to be assumed that there was an exposure event, the following is not known:

- the specific type of VOCs and their concentration level during the flight;
- the concentration of total VOC during the flight;
- whether the type and concentration of VOCs of the total VOC actually present would generally be expected to cause the type of symptoms reported by Ms. Rivers and;
- if so the relative significance of operating with a broken air pack in the circumstances.

[25] Ms. Shirreff argued that the analysis is complicated by the fact that there is simply no way of telling whether different people on board may have experienced similar non-specific symptoms for a variety of reasons unrelated to cabin air quality. She stated that the evidence indicated that the general symptoms that Ms. Rivers reported in connection with the July 2004 flight can be attributed to a variety of common causes other than air quality, including: underlying medical impairment; use of medication; fatigue; stress; sensitivity to noise; dehydration; and, in the case of the passengers, susceptibility to motion sickness.

[26] Furthermore, Ms. Shirreff submitted the analysis is also complicated by the fact, as Dr. Thibeault explained, cabin crew and passengers frequently complain of non-specific

symptoms such as headache, fatigue, nausea and dizziness during normal operation with two air packs and that there is no ready explanation for this phenomenon.

[27] Considering all the relevant evidence in the appeal, Ms. Shirreff submitted that, it is unreasonable to conclude that operating the A321 aircraft on March 14, 2005 with a broken air pack would have exposed Ms. Rivers to a "danger", or that operating any aircraft with one broken air pack could reasonably be expected to cause injury or illness to a crew member.

[28] Ms. Shirreff argued that, in the absence of objective and convincing evidence that the non-specific symptoms reported by Ms. Rivers on the July 17, 2004 flight were reasonably likely to have resulted from the broken air pack, the appellant's concern that flying with a broken air pack on March 14, 2005 posed a danger for Ms. Rivers' health can only be viewed as speculative or, at best, a "mere possibility".

[29] Finally, even if there was a "mere possibility" or risk that similar symptoms to those described by Ms. Rivers could have presented on March 14, 2005 flight or, indeed, that such symptoms could present on any flight operating with a broken air pack, Ms. Shirreff argued that this is not sufficient to meet the higher standard the Code requires for finding "danger".

Analysis

[30] I must determine whether a danger existed or not for Ms. Rivers when performing her duties as an In Charge Flight Attendant on an A321 aircraft operating with one broken air pack on March 14, 2005.

[31] The term "danger" is defined under ss. 122(1) of the Code which reads as follows:

> "danger" means any existing or **potential** hazard or **condition** or any current or future activity that could **reasonably be expected to cause injury or illness** to a person exposed to it before the hazard or condition can be corrected, or the activity altered, whether or not the injury or illness occurs immediately after the exposure to the hazard, condition or activity, and includes any exposure to a hazardous substance that is likely to result in a chronic illness, in disease or in damage to the reproductive system; [Emphasis added]

[32] The Federal Court and the Federal Court of Appeal in *Martin* v. *Canada (Attorney General)* [3,4] and in *Verville* v. *Canada (Correctional Services)*[5] determined that in order to find that a "danger" exists the following is applicable:

- the new definition of "danger" in the Code makes it clear that any potential hazard or condition or future activity can constitute a danger; this means that a safety

[3] [2003] FC 1158, paragraph 55
[4] [2005] FCA 156, paragraph 37
[5] [2004] FC 767, paragraphs 36 and 51

officer can look beyond the immediate circumstances that existed at the time of his investigation to determine whether "danger" existed as defined in the Code;

- the "danger" cannot be based on speculation or hypothesis; however when attempting to ascertain whether a potential hazard or future activity could reasonably be expected to cause injury before the hazard could be corrected or the activity altered, one is necessarily dealing with the future; tribunals are regularly required to infer from the past and the present circumstances what is expected to transpire in the future; the task of the tribunal in such cases is to weigh the evidence to determine whether it is more likely than not that what an applicant is asserting will take place in the future;

- it is not necessary to establish precisely the time when the hazard, condition or activity will occur, but only to ascertain in what circumstances it could reasonably be expected to cause injury and establish that such circumstances will occur in the future, not as a mere possibility;

- when considering whether a situation can reasonably be expected to cause injury or illness, a reasonable expectation could be based on expert opinions; it could even be established through an inference arising logically or reasonably from known facts.

1) In what circumstances could a broken air pack on an A321 aircraft be reasonably expected to cause an injury or illness to Ms. Rivers?

[33] A broken air pack on an A321 aircraft can occur while the aircraft is in operation on the ground before departure or after take off during the flight. Ms. Rivers refused to work in March 2005 because she had knowledge that the air pack was broken prior to departure which was the same condition as in July 2004. Therefore, I will focus on the condition from the perspective that it emanated while the aircraft was on the ground before departure.

a) What are the effects of a broken air pack on an A321 aircraft particularly when on the ground before departure?

[34] The evidence provided by Mr. Drennan was, that at any given time, there would be one or two aircraft in the single aisle Airbus fleet in maintenance for repair of the type of air pack fault that occurred on the aircraft at issue in July 2004 and March 2005. He stated that of the eighty-five aircraft in the Airbus single aisle fleet[6] in operation that it was likely at least one aircraft per day operates with an air pack fault. He stated that most air packs break during the flight rather than on the ground before departure.

[35] No measurements for ventilation rates or contaminants were taken by anyone from any of the A321 aircraft in the employer's fleet in circumstances similar to this case. I retain and give weight to the expert evidence of Dr. Walkinshaw who was the only witness

[6] Ten A321 models are in the Airbus fleet

to provide me with an engineering opinion on the effects of a broken air pack on an A321 aircraft. Dr. Walkinshaw's opinion is based on the material he considered which included his own studies, the BRE report[7] and a study made by Airbus (Dechow)[8].

[36] Dr. Walkinshaw explained that, without two fully functional air packs, the effect is a physical degradation of the quality of air in the aircraft cabin through a reduction in the ability to cool the cabin air and the reduction in ventilation rates. I am convinced through his analysis of the condition on July 17, 2004 and March 14, 2005, that a broken air pack reduces ventilation rates substantially.

[37] According to Dr. Walkinshaw's evidence, change in ventilation rates was the most significant factor. His study indicated that a broken air pack would result in an increase of gaseous contaminants in the aircraft's cabin. He identified various contaminants present in aircraft cabins and in his opinion the most important gaseous contaminants which are not filtered by the HEPA[9] filters in the A321 aircraft are VOCs.

[38] Dr. Walkinshaw established theoretically that a significant source of VOCs is within the aircraft cabin envelop[10]. He stated that another important source of VOCs is human bioeffluent and because of the high occupancy density in an aircraft, dose exposure to cabin bioeffluent is significantly higher of those found on the ground such as in classrooms or offices within buildings.

[39] There was no dispute in this case that ventilation dilutes and removes contaminants in the air nor was there any dispute that the ventilation reduction cannot be corrected or altered during the course of exposure on a flight.

[40] I can conclude from the evidence of Dr. Walkinshaw that VOC contamination increases with temperature because VOCs are volatile and as a result they increase their off gassing, i.e. transfer from surfaces to air when the temperature is higher. Also, I conclude that temperature is also significant with respect to VOC production by humans in that a warmer occupant will produce more VOCs.

[41] Therefore, I am convinced that a broken air pack on an A321 aircraft, can create an environment in the cabin on the ground that persists during the flight that will be made of the following:

- reduced ventilation rates;
- increased cabin temperature;
- increased off gassing of VOCs and other contaminants.

[7] British Research Establishment (BRE) Report 212034, October 2003 to the UK Cross Department Aviation Health Working Group
[8] Dechow, M: Sohn, H: Steinhanses, J. (1997) "Concentrations of selected contaminants in cabin air of Airbus aircraft"
[9] High Efficiency Particulate Absorbing i.e. a high-efficiency air filter
[10] The space located between the cabin lining and the outer shell of the aircraft

[42] Furthermore, I retain from the uncontested evidence of Dr. Walkinshaw that the environment in the cabin prior to departure caused by a broken air pack can be effected by a variety of contributing factors such as the following:

- if the weather is hotter as it was on July 17, 2004, the effect will be an increase in volatility of VOCs and off gassing in the cabin;
- if the weather is hotter as it was on July 17, 2004, the effect will be that the cold soak period is longer and increase the period during which VOC production and other contaminants associated with moisture in the envelope occurs;
- the length of time the aircraft operates with a broken air pack will have an effect on the air quality, the longer the length of time the worse the condition becomes, in this case there was a greater effect on the July 2004 flight because the July 2004 aircraft's time with a broken air pack was longer than that of the March 2005 aircraft.

[43] In view of that, I am convinced from the evidence of Dr. Walkinshaw that the weather on the ground prior to departure with a broken air pack has a significant impact in the cabin that will continue during the flight. The hotter weather at departure can create a more hazardous environment in the aircraft cabin. Therefore, the hot weather at departure as it was on the July 2004 flight, would have the following effect in the cabin:

- increase the off gassing of VOCs;
- increase the cold soak period and thus increase the production of VOCs and other contaminants;
- reduced air quality because of the length of time the aircraft operated with a broken air.

b) Is there a reasonable expectation that a broken air pack could cause an injury or an illness to Ms. Rivers in the circumstances below?

- **reduced ventilation rates**
- **an increase in cabin temperature and**
- **an increase in off gassing of VOCs and other contaminants**

[44] For this question I will consider the evidence of Dr. McGoveran and Dr. Thibeault. I will also concentrate on the past incident involving Ms. Rivers which occurred on the July 2004 flight and the incident on the March 2005 flight which was the day of the refusal.

[45] I received opposing medical opinions from the appellant's expert Dr. McGoveran and the respondent's expert Dr. Thibeault on the issue of whether or not a broken air pack was the cause of the symptoms suffered by Ms. Rivers on the July 17 2004 and whether or not it could recur in the future.

[46] Both experts agree that a constellation of symptoms such as those described by Ms. Rivers constituted an illness. However, where they disagree is whether the broken air pack on the A321 aircraft on the July 2004 flight could have resulted in the symptoms

described by Ms. Rivers and whether the likelihood that the potential condition could result in similar symptoms in the future.

[47] Dr. McGoveran's opinion was that the symptoms suffered by Ms. Rivers consisting of headache, dizziness, fatigue, loss of coordination and secondary symptom of nausea resulting from the July 17, 2004, flight were reasonably likely to have resulted from the broken air pack.

[48] Furthermore, it was Dr. McGoveran's opinion that in circumstances similar to or exceeding those of the July, 2004 flight, the symptoms as reported by Ms. Rivers were reasonably likely to recur. He specified that the circumstances he is referring to were the broken air pack and prevailing exterior environmental conditions, mainly, a hot, humid day.

[49] On the other hand, it was Dr. Thibeault's opinion that one cannot conclude that the failed air pack resulted in the symptoms described by Ms. Rivers and that one cannot conclude that in the future flying with a broken air pack would result in the same or similar symptoms to those reported by Ms. Rivers in July 2004.

[50] It was Dr. Thibeault's opinion that the July 2004 incident was the only time that the type of symptoms described by Ms. Rivers have been reported in connection with a broken air pack flight is particularly significant to this appeal. His evidence is that crew and passengers frequently present the same general symptoms as those described by Ms. Rivers on flights with no broken air packs and no single explanation has been found to explain this phenomenon.

[51] On the issue of the medical evidence, I prefer that of Dr. McGoveran over the evidence of Dr. Thibeault for the following reasons:

- Dr. McGoveran is a specialist in the field of occupational medicine;
- his opinion is based on reasoning consistent with typical occupational medicine studies of exposure-outcome;
- he took account of all available data.

[52] I retain from Dr. McGoveran's evidence that during the July 17, 2004 flight, Ms. Rivers suffered an illness from "the constellation of symptoms that had aspects compatible with injury". He stated that an illness is a constellation of symptoms and signs and that the term injury applies where trauma occurs. After ruling out all alternative explanations for Ms. Rivers' symptoms he identified the illness she suffered as an "irritant type response to a complex work place exposure, primarily chemical".

[53] The exposure factors Dr. McGoveran attributed to the failed air pack on the A321 aircraft were the following:

- low ventilation rate, particularly, low fresh air ventilation rate;
- presence of Volatile Organic Compounds (VOCs);
- higher ambient temperature which leads to higher level of VOCs.

[54] I retain from Dr. McGoveran's evidence, which is similar to Dr. Walkinshaw's, that the impact of the cold weather and the shorter period during which the air pack was broken on the March 14, 2005 flight would have an impact on the two key exposure factors: cabin temperature and the levels of VOCs which, Dr. McGoveran considered to be reasonably likely to lead to the symptoms reported by Ms. Rivers on the July 17, 2004 flight.

[55] I conclude that a broken air pack on an A321 aircraft in itself has a negative impact on; cabin temperature, ventilation rates and, with the off gassing of VOCs. Moreover, based on the evidence of Dr. Walkinshaw and Dr. McGoveran, I conclude that the weather on the ground at departure has a major influence on the cabin environment on any flight with a broken air pack. As stated by the experts, when the outside temperature is hot, the interior cabin environment also becomes hot. The hot outside temperature will keep the cabin temperature high on the ground as well as in the air which in turn increases the off gassing of VOCs and other contaminants.

[56] Consequently, I am convinced by the evidence that the experts provided that the symptoms that Ms. Rivers suffered on the July 2004 flight were reasonably likely to have resulted from the environmental conditions in the cabin due to the failed air pack.

[57] However, I also understand from the evidence that these symptoms are only likely to recur in an environment similar or exceeding July 17, 2004, that is mainly, a hot and humid day. Therefore, although the circumstances that caused an injury and illness to Mrs Rivers on the July 2004 flight were similar to the circumstances that prevailed on the March 2005 flight, an important factor was not present on the day of the refusal. The missing factor was that the outside temperature at departure differed considerably.

[58] The temperature on the ground before departure is a significant factor because it has an impact on the two exposure factors that the appellant's expert identified could have reasonably caused the symptoms suffered by Ms. Rivers on the July 2004 flight. The exposure factors mentioned are:

- cabin temperature and;
- the levels of VOCs.

[59] The weather provided from the agreed statement of facts for July 17, 2004 indicated that the ground temperature at the airport was in the mid twenties Celsius by mid morning while the ground temperature on March 14, 2005 was below freezing all day.

[60] Ultimately, given that the expert evidence convinced me that the exterior environmental conditions on the ground has a major impact on the cabin environment, I cannot conclude that a broken air pack on the March 2005 flight could have reasonably cause an injury or illness to Ms. Rivers.

Conclusion

[61] Pursuant to ss. 146.1(1) of the Code, my statutory jurisdiction is limited to making a decision based on the circumstances that existed at the time of the work refusal to determine whether the HSO arrived at the correct decision.

[62] Accordingly, given the fact that the specific circumstances that are necessary for a danger to exist were not present which includes the exterior environmental conditions; I have no choice but to conclude that Ms. Rivers was not exposed to a danger on the day she exercised her right to refuse dangerous work.

[63] I am certain that hot humid temperature will recur and there is likelihood that there will be an A321 aircraft with a broken air pack on the ground somewhere in Canada or in some other foreign land where Air Canada operates. Therefore, I strongly urge that the employer endeavour to take measures that are prescribed in the Code and Regulations to protect employees as well as the flying public in such circumstances.

[64] Notwithstanding the expert evidence provided in this case, I believe that factual data and analysis was missing. It is stated in the Aviation Occupational Safety and Health Regulations, under ss. 5.3, that where there is a likelihood that the safety or health of an employee on an aircraft is or may be jeopardized by exposure to a hazardous substance the employer shall appoint a qualified person and carry out an investigation.

[65] This said, I believe that an investigation by a qualified person accompanied by a report of the findings would provide crucial information and thus contribute to appropriate preventative measures to address the hazardous environment created in some circumstances by the condition that is at issue in this appeal. This type of an investigation also allows for consultation with the work place safety and health committee or representative thereby providing employees with an opportunity to participate in the process.

Decision

[66] For all the reasons above I hereby confirm the decision that a danger did not exist rendered by HSO Gass on March 16, 2005.

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Michael Wiwchar
Appeals Officer