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# Final Response

to the Commission of Inquiry  
into the Air Ontario Crash  
at Dryden, Ontario

July 1995

Canada

Government of Canada

**Final Response**

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# Foreword

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## Foreword

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On March 10, 1989, an Air Ontario F-28 aircraft crashed on take-off from Dryden Airport; 24 people died. Transport Canada would like to express deep sympathy to the families of the victims of the crash and to the survivors.

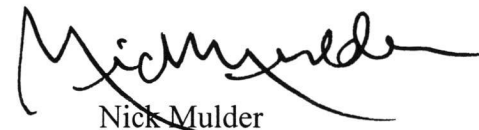
The government's response to this accident comprised a series of initiatives that began with a Commission of Inquiry headed by the Honourable Mr. Justice Virgil P. Moshansky. The Dryden Commission Implementation Project was subsequently established to ensure that serious consideration was given to each of the 191 recommendations resulting from the inquiry.

The Implementation Project brought industry, labour and government together to develop implementation measures. One-hundred-and-thirty recommendations have since been implemented. Many of these are regulatory amendments awaiting formal promulgation through the new Canadian Aviation Regulations and associated standards.

Most of the remaining 61 recommendations will be implemented through changes to other standards and regulations. Some are being considered for implementation through amendments to existing legislation.

We would like to acknowledge the many dedicated groups and individuals who contributed their expertise to the Implementation Project. A list of contributing organizations follows Part II of this report.

The safety of Canadian transportation is Transport Canada's top priority. The Dryden Commission, in identifying the accident's cause and contributing factors and in making recommendations, took the first step toward rectifying the problems that led to the crash. The Dryden Commission Implementation Project, which has created a blueprint for implementing the Commission's recommendations, was the second step. Thanks to the work of both, the legacy of the Dryden tragedy will be a safer air transportation system.



Nick Mulder  
Deputy Minister of Transport  
July 1995

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# Part I

## The Accident, the Inquiry and the Implementation Project

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## Part I

### **The Accident, the Inquiry and the Implementation Project**

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At approximately 12:11 p.m. on Friday, March 10, 1989, an Air Ontario Fokker F-28 Mk1000 aeroplane, bearing Canadian registration C-FONF, on a flight to Winnipeg, Manitoba, from Thunder Bay, Ontario, crashed on take-off from Dryden Municipal Airport. The aircraft carried 65 passengers and a crew of four. Twenty-one passengers and three crew members died in the crash and ensuing fire.

#### **The Commission of Inquiry into the Air Ontario Crash at Dryden, Ontario**

The Government of Canada created a special commission to inquire into the accident's causes and contributing factors. Called the Commission of Inquiry into the Air Ontario Crash at Dryden, Ontario, it was given a wide mandate. As the Commissioner, the Honourable Mr. Justice Virgil P. Moshansky of the Court of Queen's Bench of Alberta, explained:

"I interpret the terms of reference to provide a broad mandate to inquire not only into the Air Ontario crash but also

into any derivative matters which affect aviation safety, with respect to which I am directed to make such recommendations as I may deem appropriate."<sup>1</sup>

Given the complexity and breadth of its task, the Commission adopted a systems approach, which entailed a detailed analysis of the following components:

- the aircraft crew, which consisted of the captain, the first officer, and two flight attendants;
- the Fokker F-28 aircraft, C-FONF;
- the immediate operational infrastructure of the crew, which included airport facilities, navigation aids, the weather, and communications facilities;
- the air operator,<sup>2</sup> Air Ontario; and
- the regulator, Transport Canada.

The Commission spent three years in intense investigation, research, hearings, and analysis and identified, not only the main cause and contributing factors of the accident, but also safety-related deficiencies within Air Ontario, Transport Canada, and the aviation industry. Specifically, it conducted a comprehensive technical investigation of the Fokker F-28 aircraft and an in-depth evaluation of the emergency response to the crash. It examined Air Ontario's corporate history, management organization, operational control system, and every facet of its F-28

program. In addition, the Commission reviewed the workings of Transport Canada, its organization, the problems faced by the Department during the 1980s, its resourcing process, audit program, and its aviation-related legislation. Of particular interest to the Commission were the human factors involved in the accident, especially crew coordination and communication.

Several problems were found early on that, in the Commission's opinion, required urgent attention. In order to identify them without delay, an initial Interim Report was issued in December 1989, followed by a Second Interim Report in December 1990. Then in late March 1992, the Commission released its Final Report, an exhaustive study consisting of four volumes more than 1600 pages in length. Broad in scope and incisive in its analysis of the deficiencies within Canada's air transportation system, the Final Report contained many findings and 191 recommendations covering every aspect of aviation safety. These recommendations became the basis for making fundamental changes to Canada's aviation safety system.

## **The Mandate of the Dryden Commission Implementation Project (DCIP)**

Traditionally the recommendations made by a commission of inquiry are divided by subject and assigned for implementation to their related functional areas within a department. Where the subject being treated is broad or complex, as is the case here, this approach gives rise to several problems. The traditional approach makes it difficult to develop an overall implementation plan and to coordinate the responses of the different functional areas in order to prevent overlap and duplication of effort. It also makes it difficult to ensure that the underlying problems are properly addressed. In order to avoid these problems, the government adopted another approach in its response to the findings of the Inquiry.

In July 1991, the government created the Dryden Commission Implementation Project (DCIP) and made it solely responsible for managing the implementation of the Commission's recommendations. The Project consisted of two parts. Phase I, which is now complete, evaluated each recommendation and developed implementation proposals that were submitted to senior government management for approval. Phase II, which is ongoing, will ensure that the approved implementation measures are properly carried out.

In approaching its task, DCIP adopted two fundamental principles. **The first was that it should address the problems identified by the Commission rather than simply fulfil by rote the requirements of the recommendations.** Consequently, each recommendation was analyzed within the context of present-day conditions, in particular with the changes that had taken place since the accident. DCIP also identified related critical or contentious issues and considered the recommendations of previous commissions, committees, and groups, both within and outside the federal government.

**The second fundamental principle adopted by DCIP was that the needs of the aviation community should be fully considered in the process of developing the implementation measures.** It was DCIP's belief that it is only with the full cooperation and commitment of the aviation community that the safety of Canada's air transportation system can be maintained and improved. As a result, representatives from all segments of Canada's aviation community were invited to join as partners in the Project. The aviation community responded enthusiastically, and its sustained participation throughout the process was integral to the success of Phase I.

While safety was always DCIP's first priority, the criteria used to evaluate the different implementation options included an estimate of their probable cost to

both the aviation industry and Transport Canada, as well as an assessment of the possible impact of the proposed options on the operations and competitiveness of air operators. In addition, every effort was made to reduce the complexity of existing legislative requirements and to modernize the overall air transportation safety system. In order to ensure that the regulatory conditions imposed on the Canadian aviation industry did not hamper its competitiveness internationally, regulatory solutions were also harmonized with those of other countries, particularly with those of the United States, whenever it was reasonable to do so.

## **The Structure and Organization of DCIP**

The basic structure of the Dryden Commission Implementation Project consisted of: an Executive Steering Committee (ESC), a Project Advisory Committee (PAC), the DCIP management team, and the Task Groups. In order to obtain a high level of management commitment and support, the ESC was composed of senior executives from Transport Canada, Treasury Board Secretariat, and the Privy Council Office. The ESC, which was chaired by the Assistant Deputy Minister, Aviation, was mandated to review the implementation proposals recommended to it by the PAC, make modifications to the proposals where

necessary, and approve the measures that would be used to implement the Commission's recommendations.

DCIP's next level of management was that of the Project Advisory Committee, which was chaired by the Director General, Aviation Regulation. In accordance with the principle that the cooperation of the aviation community was pivotal to DCIP's success, the PAC consisted not only of senior executives from Transport Canada, but also from the constituents of the aviation community, including both labour and management. Its mandate was to provide advice and guidance to the Task Groups in their formulation of implementation proposals, to evaluate the Task Group Reports, and to recommend the implementation proposals to the ESC for approval. In particular, the PAC was responsible for ensuring that, while safety was always the highest priority, the proposed implementation measures were realistic and practical for implementation.

The head of the DCIP management team directed the day-to-day activities of the Project including technical and logistical support to committees and Task Groups. Reporting to the Executive Project Director in the person of the Director General, Aviation Regulation, the Project Director kept the Executive Steering Committee and the Project Advisory Committee abreast of the status of the Project and sought their direction when necessary.

In order to address the Commission's recommendations in an efficient and concerted manner, they were grouped by subject area and assigned to individual Task Groups for analysis. There were two types of Task Group, one of which consisted of members from both government and industry, and the other whose members came from the government only. The joint government-industry Task Groups dealt with the following subject areas:

- Surveillance
- Cabin Safety
- Airport Operations: Ground-handling Operations and Emergency Response Services
- Safety
- Operations, Certification, and Approvals Process
- Operational Control
- Research and Development

The government-only Task Groups handled those recommendations related to: resources, inspector training, rules, organizational and corporate issues, the Transportation Safety Board (TSB), and the Privy Council Office (PCO).

Composed of senior professionals with expertise in the area under study, the Task Groups analyzed the recommendations and related information, conducted studies where necessary, developed and evaluated the

implementation options, identified the impact of the options, and formulated proposals. Most members, in particular, those from the aviation community, served on the Task Groups at the same time as they performed their regular duties. The travel and accommodation expenses of the members were assumed by their respective sponsoring organizations. Each Task Group was headed by a full-time Task Group Manager who was responsible for guiding all aspects of the Task Group's work.

### ***DCIP Reports***

On March 26, 1992, at the same time as the Dryden Commission submitted its Final Report and 191 recommendations, the DCIP issued an initial response on behalf of the Government of Canada. This initial response identified those recommendations that had already been addressed, those for which measures were being undertaken, and those that had been referred to DCIP for consideration. At that point, 35 recommendations were deemed to be complete. In September 1992, DCIP issued a six-month progress report detailing the recommendations by subject group and outlining the status of each. A further seven had been completed, 101 were under way, and 48 had yet to be considered by the Task Groups.

This Final Response seeks to provide a context for the Commission's recommendations and explain the

implementation measures approved by the ESC. It summarizes the events that led to the accident, describes the crash and ensuing rescue effort, and outlines the accident's cause and contributing factors. This Final Response also presents an analysis of the salient problems identified by the Commission, explains how the approved implementation measures address these problems, and outlines how the safety of the air transportation system will be improved.

### **The Dryden Accident**

Accidents and incidents are usually due to an accretion of actions and circumstances that, had they occurred alone, would not have had serious consequences. The Dryden accident, with the convergence of several seemingly innocuous and unrelated events, is a striking illustration of this principle at work.<sup>3</sup> The following summarizes the description of these events detailed in the Commission's Final Report.

#### ***The Circumstances Surrounding the Accident***

The Fokker F-28 aircraft, C-FONF, was scheduled to make four flights on March 10, 1989. Flight 1363 to Winnipeg from Thunder Bay with a stop at Dryden was the second flight.

The early morning weather forecast for the Winnipeg-Dryden-Thunder Bay area called for generally unsettled and deteriorating conditions with low cloud, temperatures near 0°C, and freezing rain expected. The unsettled weather conditions covered a broad area; consequently, the planned alternate destinations for the day's flights were distant and more than the usual amount of fuel had to be carried. It was also the Friday before the spring school break, and many families were travelling from Thunder Bay to Winnipeg. The weight of the extra fuel, combined with the heavy passenger load, meant that the flight would have to be refuelled at Dryden, which was not normally necessary.

In order to start the engines of a Fokker F-28 aeroplane, a source of compressed air is needed. An auxiliary power unit (APU), a small gas-powered turbine engine installed on the aeroplane, is usually used for this purpose. If the auxiliary power unit is unserviceable, airport ground-start facilities can also be used or, once started, one engine can serve as a source of compressed air for the other. The auxiliary power unit of C-FONF was not working properly on the day of the accident, and Dryden Municipal Airport did not have ground-start facilities; consequently, it would be necessary to refuel the aeroplane with one of its engines running.

Also at the time, Air Ontario had an operational restriction in place that prohibited the de-icing of a Fokker F-28 while its engines were running. This

restriction created a potential problem for the crew of C-FONF. With a weather forecast of freezing rain, an inoperative auxiliary power unit, and no ground-start facilities, it would not be possible to de-ice the Fokker F-28 at Dryden without disobeying the operational restriction.

### ***The Events Leading up to the Accident***

Had any one of the above circumstances been absent, the Dryden accident might not have occurred; however, this set of circumstances alone was not sufficient to cause the accident. Only when they were combined with the specific events of that morning did the crash become inevitable. The increasing lateness of the flights, inaccuracies in the operational flight plan, and the poor operational control provided by Air Ontario were pivotal factors.

When C-FONF landed at Dryden on its way back to Winnipeg, it was one hour late. Between 11:40 a.m. and noon, the aircraft was refuelled with one engine running while the passengers remained on board. Shortly before the second engine was restarted, a fueller boarded the aircraft to deliver the fuel slip, and Captain Morwood asked if de-icing was available. It was. The Commission concluded that from his question, it is evident that Captain Morwood considered having the aircraft de-iced before leaving Dryden.

At 12:03 p.m., in the midst of a snow squall that covered the entire eastern half of the airport, the aeroplane taxied out to runway 29 for take-off. Just as it reached the runway and was getting ready for take-off, the flight crew was requested to hold at the end of the runway for an incoming Cessna 150 whose pilot was inexperienced and in serious trouble because of the weather.<sup>4</sup>

At 12:07 p.m., C-FONF taxied onto the runway and the flight received its clearance to Winnipeg. The aircraft moved to the east end of runway 29, powered up its engines for about 15 seconds, and began its final take-off roll. By this time, the flight was approximately one hour and 10 minutes late.<sup>5</sup>

### ***The Take-off and Crash of C-FONF***

The aeroplane's cockpit voice recorders and flight data recorders were destroyed by the fire following the accident; consequently, the technical information and cockpit conversation that are usually captured by these devices were unavailable to investigators. As a result, the Commission had to piece together the events of the take-off and subsequent crash based on the observations of the passengers, the surviving crew member, and witnesses on the ground.

The Commission determined that C-FONF attempted a first lift off, or rotation, at about the 3500-foot mark, a

little after the usual point of rotation, but it shuddered and dropped back down onto the tarmac. The aeroplane rotated again and finally lifted off at approximately the 5700 mark of the 6000-foot runway, at a height of only about 15 feet above the ground. Not able to gain altitude, it began hitting tree tops, and as they began to ingest leaves and branches, the engines lost power. C-FONF struck tree tops for about half a kilometre as it fell, causing fire to break out on its left side, which hit the ground first. Fire damaged the trees along the aeroplane's flight path and, except for part of the right fuselage, completely destroyed the aircraft from the cockpit to the back of the passenger cabin.

### ***The Rescue Effort***

The Commission recorded that flight 1363's final radio message to the Kenora Flight Service Station was at 12:09:29. By 12:12:47, smoke could be seen west of the airport, and the Chief of Dryden Municipal Airport's crash, fire-fighting, and rescue unit advised Kenora that C-FONF had probably gone down. About two minutes later, the Chief, on his way to the crash site, called the Town of Dryden's police dispatch and requested that the area's mutual aid emergency plan be activated.<sup>6</sup>

The Chief established a command post at a road about 150 yards away from the aircraft where civilians, Ontario Provincial Police officers, the Unorganized Territories of Ontario fire-fighting unit, the Town of

Dryden fire-fighting unit, and medical personnel from the Dryden Municipal Hospital assembled. By 1:45 p.m., about an hour and a half after the first rescuers began to arrive at the scene, all the surviving passengers had reached or been assisted to the command post.

Airport emergency response personnel are specifically trained to respond to aircraft-related emergencies. While the primary objective of emergency response services is to save lives, its emphasis should be on providing a fire-free escape route for passengers and crew. A secondary objective is to preserve the property involved by containing or extinguishing any fire.<sup>7</sup> It was not until almost two hours after the crash, that rescue workers began to apply foam to the still burning wreckage.

Despite these deficiencies in the emergency response effort, the Commission commended the town of Dryden in a formal finding:

Apart from the noted deficiencies in the fire-fighting response at the scene of the crash, the collective efforts of all persons, agencies, businesses, and officials in the Town of Dryden relating to the crash were timely and carried out in a responsible, compassionate, and meaningful manner.<sup>8</sup>

### ***The Cause and Contributing Factors of the Accident***

The Dryden crash occurred because of the presence of ice on the wings of C-FONF as it took off from Dryden Municipal Airport. The Commission described the accident's cause in the following finding:

During the take-off of aircraft C-FONF from the Dryden airport, the wings of the aircraft were contaminated to a critical level, resulting in the degradation of the aircraft's aerodynamic performance by reducing its lifting capability and increasing the drag on the aircraft to the extent that, as the aircraft climbed out of ground effect, the performance loss caused the aircraft to descend and crash.<sup>9</sup>

Other contributing factors determined by the Commission included the weather; unusually heavy passenger traffic along the Thunder Bay-to-Winnipeg route; inaccuracies in the operational flight plan; the fact that the aircraft had already made several flights and the fuel had become cold soaked; the unserviceable Auxiliary Power Unit (APU), which meant that one engine had to be left running while it was on the ground; the carrier's policy against de-icing the Fokker F-28 aircraft with its engines running; the lack of ground-start facilities at Dryden Municipal Airport; the human decision-making element, and the fact that Air

Ontario's dispatchers were poorly trained and had limited experience.

## **Addressing the Commission's Recommendations**

In addressing the Commission's recommendations, the Dryden Commission Implementation Project faced a series of challenges, one of which was dealing with the sheer breadth of the issues involved. Some recommendations treated aircraft contamination, the main cause of the accident, while others were concerned with such matters as the permitted deferral of repairs, the availability of ground-start facilities, and the training of flight dispatchers, which related to the accident's contributing factors. There were also a number of recommendations that delved into factors that come into play only once an accident has occurred. The recommendations pertaining to the flammability of an aeroplane's interior, the effectiveness of the emergency response to a crash, and the legislation governing accident investigations fell into this latter category.

Another challenge was that the recommendations differed in their relative importance to aviation safety depending on whether they imposed a new requirement on air operators or on the government. Since safety is ultimately achieved or undermined at the

level of day-to-day air operations, those recommendations that focused directly on air operators were usually considered the most important. At the next level were the recommendations geared to ensuring that the requirements placed on air operators are complied with — those related to Transport Canada's surveillance responsibilities. At another remove were those that dealt with Transport Canada's administration, management, and organization because these activities support the conduct of inspections and audits. While most of the recommendations were addressed in one way or another to Transport Canada as regulator of the aviation industry or operator of airports in Canada, a few were directed to the Privy Council Office (PCO) or the Transportation Safety Board (TSB). These latter recommendations were concerned with the inquiry and accident investigation processes and were, consequently, at one more remove in terms of their contribution to aviation safety. These differences in level of importance were pivotal when interpreting the requirements of the recommendations and developing appropriate implementation measures.

In defining the relevant issues and determining the intent of the recommendations, the Task Groups relied on the information contained in the Commission's Final Report and on their knowledge of the aviation industry, Transport Canada's mandate, and the changes that had taken place since the accident.

For those recommendations directed at air operators, it was necessary for the Task Groups to establish to which types of operation the implementation measures should apply. Airline operations involve aircraft which are certified to transport more than 20 passengers; consequently, virtually all of the measures were made applicable to this category of operations. Sometimes, where the risks inherent in a given activity were deemed to be particularly high, the measures were also made applicable to commuter operations, involving aircraft which carry from 10 to 19 passengers. Exceptionally, they included air taxi operations where aircraft carry less than 10 passengers and make only short trips. Aerial work and foreign operations were usually excluded. On occasion, a recommendation was directed not only to air operators, who by definition transport cargo and fare-paying passengers, but to private pilots as well; in these cases, the implementation measures do not apply to specific types of operations, but to all pilots.

Where a recommendation applied to air operators, a wide range of possible implementation methods was available. Where a problem was considered to be more important, formal means, such as changes to regulations or the approval and certification process, could be used. For less important problems, compliance could be made voluntary, and an Air Carrier Advisory Circular issued or an amendment to

the *Aeronautical Information Publication (AIP) Canada* published.

The recommendations were distributed among the Task Groups according to their applicability. Of the Commission's 191 recommendations, 115 applied directly to air operators, and were assigned to the joint industry-government Task Groups. Twenty-five recommendations applied to Transport Canada, and 17 were addressed to the TSB or the Privy Council Office; these latter 42 were handled by the government-only Task Groups. As already mentioned, 35 recommendations had been deemed already complete in the Government's Initial Response to the Commission's Final Report and were not addressed by the Project.

For each recommendation or group of recommendations treated by a Task Group, a separate report was prepared. These reports were simple in structure and all organized in the same way. A background section was used to define the problem under consideration, a methodology section followed outlining the work that had been done by the Task Group, and an Options Analysis section described the advantages and weaknesses of each option considered.

Although every effort was made at the Task Group level to reach a consensus on the chosen implementation option, there were a number of

occasions when some participants disagreed with the rest of the Group. Of the 70 reports prepared by the industry-government Task Groups in response to their 115 assigned recommendations, 12 contain dissenting views. In four instances, these dissents were accepted by the ESC, and the decision of the Task Group either reversed or the dissent addressed in another manner. Dissenting views were accommodated in a separate section of the Task Group Reports, and the dissenting organization's position was either summarized in the report or appended to it. The final section of each report consisted of the implementation proposals.

### **Related Projects that Complement or Complete DCIP**

The Dryden Commission Implementation Project did not take place in isolation. Other initiatives have served to complement or complete its work: the Regulatory Renewal Project, which was preceded by the Regulatory Review Project; the Air Carrier Inspection Task Force; and the Canadian Aviation Regulation Advisory Council (CARAC) which was modelled after the DCIP.

### **Canada's Aviation Legislation**

In order to maintain the safety of the air transportation system, air operators must fulfil certain regulatory

requirements in order to be allowed to transport fare-paying passengers. These requirements seek to provide a framework for orderly day-to-day operations, competent crews, the operation of well-maintained aircraft, and a strong support system. They are contained in three pieces of legislation: the *Aeronautics Act*, the *Air Regulations*, and the Air Navigation Orders.

The *Aeronautics Act* empowers the Minister to regulate all matters related to aeronautics; the *Air Regulations* amplify the provisions of the *Act* by providing various authorities and prohibitions; and, the Air Navigation Orders, in turn, specify technical details and prescribe standards and conditions that are too lengthy to be included in the *Air Regulations*.

In June 1985, the *Aeronautics Act* was extensively revised and amended in response to the recommendations made by the Dubin Inquiry in its *Report of the Commission of Inquiry on Aviation Safety*. The 1985 amendments modernized Canada's aviation legislation and expanded the scope of the regulatory program to include the design and manufacture of aircraft as well as the regulation of aeronautical facilities and services. Seven years later, the *Act* was amended again and included, among other things, the authority to regulate the hours of work of crew members and the authority for the Minister to make Interim Orders in response to urgent safety recommendations arising from accident investigations.

Concurrent with the 1985 initiative to amend the *Aeronautics Act* was a major review and revision of the *Air Regulations* and the *Air Navigation Orders*. They were to be simplified to make them more easily understood by the aviation community and consolidated into one piece of legislation for ease of access. The progress of this endeavour was slow until 1992 when the government undertook to ensure that government regulation was not acting as a detriment to the international competitiveness of Canadian industry. Transport Canada Aviation's response was to establish the Regulatory Review Project. Composed of representatives from both government and industry, the Project systematically examined each regulation; evaluated whether it should be retained, revised, revoked, or subjected to further review; and made recommendations accordingly.

As an adjunct to Transport Canada Aviation's efforts to update its legislation, the Air Carrier Inspection Task Force (ACITF) was created in November 1991. Charged with examining the air carrier inspection process and making recommendations for its improvement, the Task Force was also a joint industry-government undertaking. The first phase, which was completed in December 1992, examined both the general inspection process and air carrier operations. The second phase assessed the airworthiness inspection process and was completed in 1993. One of the Task Force's fundamental recommendations was that the regulatory

structure governing air operators was inadequate and should be redesigned in order to make it clear, concise, accessible, and relevant to present-day conditions within the aviation industry.

### ***The Regulatory Renewal Project***

Many of the Commission's recommendations called for changes in legislation that ranged from the simple amendment of existing regulations to the development of entirely new regulatory programs. In 1992, the Regulatory Renewal Project was established to complete the work begun by the Regulatory Review Project, and put in place the legislation-related changes recommended by the Dryden Commission Implementation Project and the Air Carrier Inspection Task Force. This Project was undertaken jointly by Transport Canada Aviation and the Privy Council Office (Justice) and was charged with combining and rewriting the *Air Regulations* and the *Air Navigation Orders*. As a result of its efforts, the Canadian Aviation Regulations, CARs for short, were created.

The CARs were drafted with certain guiding principles in mind, one of which was that the requirements of legislation should not unduly burden any sector of the aviation community. As a result, the CARs have been made to apply to air operators according to the size and complexity of their individual operations, and Part

VII, which addresses commercial air services, is divided as follows by type of operation:

- Aerial work operations
- Air taxi operations
- Commuter operations
- Airline operations
- Air operator maintenance
- Foreign operations

A second guiding principle was closely related to the first and sought to incorporate a risk management approach by regulating air operators according to the inherent level of risk involved in their operations. Virtually all activities entail some degree of risk whether it be to people, property, the environment, or the regulator. When these risks are defined and the consequences of a failure of the system are quantified, safety priorities can be set, potential problems identified, and resources focused where they are most needed. Categorizing commercial air services by type of operation facilitates the evaluation of the risks associated with each, ensures that the applicable regulatory requirements are appropriate, and allows the Government's resources to be allocated more efficiently.

Another guiding principle was that the CARs should regulate only where necessary, and a fourth principle was that the aviation community should be a full partner in its own regulation. Consequently, its

constituent members were invited to comment on the content of the CARs and to participate in the development of their associated standards.

In drafting the CARs, the Regulatory Renewal Project incorporated the legislative changes required by DCIP's approved implementation measures.

### ***The Canadian Aviation Regulation Advisory Council (CARAC)***

The forum through which the aviation community participated in the development of the CARs was the Canadian Aviation Regulation Advisory Council, or CARAC. Another joint undertaking of the government and the aviation community, CARAC was established in 1993 to identify, develop, and manage the implementation of regulatory changes when they are needed. It has already been instrumental in developing the Standards that will accompany the Regulations, and after promulgation of the CARs, it will serve as the vehicle for their ongoing revision. The organizational structure of CARAC consists of the Transport Canada Aviation (TCA) Regulatory Committee, a number of permanent Technical Committees, and temporary Working Groups that are established when necessary.

The mandate of the TCA Regulatory Committee, which is composed of senior Transport Canada Aviation executives, is to identify regulatory issues that need to

be addressed, assign these issues to the appropriate CARAC Technical Committee for the development of a response, evaluate the recommendations made by the Technical Committees, and direct the implementation of those recommendations it accepts. The TCA Regulatory Committee also provides advice to the Assistant Deputy Minister, Aviation.

CARAC's Technical Committees, which include representatives from professional associations, the labour and management of both air operators and aircraft manufacturers, consumer groups, and Transport Canada Aviation, function as the counterpart to the TCA Regulatory Committee. They review and analyze the issues assigned to them by the TCA Regulatory Committee and develop appropriate regulatory changes. Working Groups composed of specialists from both government and industry are established by the Technical Committees, as required, to develop specific recommendations and to implement those that have been approved. These Working Groups are dissolved when the assigned task has been completed.

While CARAC serves as a mechanism for identifying regulatory issues that need to be addressed and, in conjunction with the aviation community, for developing appropriate responses to these issues, it is not meant to replace the Government's already existing formal legislative process or the consultation on

proposed regulations that takes place through the *Canada Gazette*, Part I.

## One Final Task

As the Dryden Commission Implementation Project winds down, one last and important task remains — that of ensuring that the implementation measures developed in response to the Commission's recommendations are properly carried out. At the time the Commission submitted its 191 recommendations to the Government, 35 were deemed to be complete. In the intervening time, another 95, for a total of 130, have been actioned and, with the promulgation of the Canadian Aviation Regulations and individual manual amendments, will be fully completed. Work on another 53 has begun or is awaiting specific legislative amendment schedules.

While the actual implementation process is well under way, its tracking and documentation remain to be done, which will be accomplished over the coming months. A formal tracking document has been developed and will be updated regularly until implementation is complete. Interested participants of the Project, as well as Justice Moshansky will continue to be kept informed of the implementation status through regular distribution of this document. The Canadian Aviation Regulation Advisory Council, many of whose members

served on DCIP's Task Groups, will also continue with its ongoing work of managing regulatory change and will ensure that the lessons learned throughout the implementation process are not forgotten.

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## Part II

### Overview of the Implementation Measures

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This overview explains the most important implementation measures and demonstrates how, through them, the safety of the air transportation system has been and will continue to be improved. This part begins with a detailed description of actions taken in response to the cause of the accident — aircraft contamination — and then summarizes the measures from the remaining subject areas.

#### Aircraft Contamination

The Commission determined that ice on the wings of the Fokker F-28 was the main cause of the Dryden accident, therefore, ensuring that aircraft critical surfaces are clean on take-off is fundamental to preventing a recurrence.

In dealing with aircraft contamination, the Commission adopted a four-pronged approach that consisted of legislation, education, the mandatory inspection of aircraft, and improved airport operations under ground icing conditions. The actions taken in response to the recommendations that address aircraft contamination have profoundly changed the attitudes of those

working in the aviation industry and the conduct of ground operations under icing conditions.

#### ***Preventing the Take-off of Contaminated Aircraft***

At the time of the Dryden accident, the Air Navigation Orders contained a general prohibition against taking off in contaminated aircraft; however, it was permissible to take off with frost, snow, or ice adhering to critical surfaces provided, in the pilot's judgement, it would not adversely affect the safety of flight. The Commission sought to ensure that the legislation governing contaminated aircraft and the manner in which it was to be applied were strengthened. In November 1990, Transport Canada moved the existing rule from the Air Navigation Orders to the *Air Regulations* and created section 540.2. Expanded and clarified, the new regulation required that an inspection of the aircraft's critical surfaces be conducted before taking off under icing conditions and that the observation of contamination by a crew member be reported to the pilot-in-command. Most important, the *Air Regulation* contained a clear proscription against taking off in an aircraft with contaminated critical surfaces. Subsection 5 stated simply:

No person shall commence a flight in an aircraft if any frost, ice or snow is adhering to any critical surface of the aircraft.<sup>10</sup>

Subsections 6 and 7 further strengthened this requirement by prohibiting an aircraft from flying

where icing conditions were expected or known to exist unless aircraft could safely fly under airborne icing conditions.

In addition to recommending the enactment of a new prohibition, the Commission also stipulated that guidelines be disseminated on how to observe the new regulation. In response, Transport Canada published interim guidelines in an *Aeronautical Information Circular* in August 1990, followed by the incorporation of permanent guidelines in October 1990 into the *Aeronautical Information Publication*. These publications are distributed to all pilots who hold a Canadian licence and to all air operators. The guidelines warn of the dangers of ground icing, explain the importance of a clean aircraft at take-off, outline the available de-icing and anti-icing methods, emphasize the need to conduct a "last chance" inspection before take-off, and in the following statement, reiterate the fundamental principle of *Air Regulation 540.2*: "If the pilot cannot confirm that the aircraft is clean, take-off must not be attempted."

Integral to ensuring that aircraft are clean before take-off is their inspection. The Commission recommended that Transport Canada develop and implement "a system of mandatory inspection of an aircraft, to be carried out by the pilot in command or his designate or other qualified company personnel." This was addressed in Subsections 2 and 3 of the regulation.

The Commission also recommended that a member of the flight crew be required to personally check the condition of the wings if a member of the cabin crew reported observing wing contamination. Subsection 4 was formulated to fulfil this requirement.

As the aviation community gained experience in applying the "clean wing" regulation, certain deficiencies became evident. There were problems with the conduct of aircraft inspections, especially with regard to large aeroplanes, and a basis for monitoring air operator ground icing operations was lacking. In order to address these problems, *Air Regulation 540.2* was amended in August 1993. The prohibition against taking off in a contaminated aircraft now appears at the beginning of the regulation, which emphasizes its importance, and the amended regulation provides air operators with an alternative to conducting a "last chance" inspection. Subsection 4 of the Regulation now reads as follows:

- (4) Where conditions are such that frost, ice or snow may reasonably be expected to adhere to the aircraft, no person shall take off or attempt to take off in an aircraft unless
  - (a) the aircraft has been inspected immediately prior to take-off to determine whether any frost, ice or snow is adhering to any of its critical surfaces; or

(b) the operator has established a program in accordance with the standards specified in the *Ground Icing Operations Standard*, as amended from time to time, and the dispatch and take-off of the aircraft comply with that program.

The Ground Icing Operations Standard is predicated in part on technology that increases the efficacy of ground icing operations. One of the essential elements of Ground Icing Operations Programs is the use of aircraft de-icing and anti-icing fluids. De-icing fluid, also referred to as Type I fluid, is a specially formulated water-glycol mixture that removes accumulated ice and snow from aircraft. More viscous and similar in composition, anti-icing fluid, also called Type II fluid, is applied to a clean surface, adheres to the aircraft in order to absorb precipitation, and is designed to come off large aeroplanes during the take-off roll. Anti-icing fluid breaks down and ceases to protect against recontamination after a limited amount of time, depending on the rate and type of precipitation. In order to guide pilots in estimating the length of time for which anti-icing fluid will be effective under given weather conditions, hold-over time tables have been developed. A Ground Icing Operations Program must clearly describe the air operator's procedures for de-icing and anti-icing its aircraft and, where they are a part of the Program, how hold-over time tables are to be used.

In setting the requirements for aircraft inspections, the Ground Icing Operations Standard defines two different types: the critical surface inspection and the pre-take-off inspection. The critical surface inspection is conducted at the gate to determine whether an aircraft needs to be de-iced/anti-iced and after treatment at the de-icing/anti-icing facility to ensure that the critical surfaces are clean. This inspection must be done from the outside and, depending on the aeroplane type, must sometimes be tactile. In contrast, the pre-take-off contamination inspection is conducted immediately prior to take-off and usually takes place at the runway's end. Depending on the requirements of the air operator's individual Program, the pre-take-off inspection may be conducted from inside or outside the aircraft, and it may be visual or tactile. Unlike the critical surface inspection, the pre-take-off inspection does not have to involve the aircraft's critical surfaces and may use a representative surface instead. A representative surface is an area, usually located on a wing, that can be seen easily from inside the aeroplane. It is designated by the manufacturer and approved by Transport Canada and is used to gauge the state of contamination of the aeroplane's critical surfaces. While at least one critical surface inspection is mandatory under an air operator's Program, a pre-take-off contamination inspection is not necessarily required if the aircraft is within the hold-over times appropriate to the fluid used and the current weather conditions. An air operator's Ground Icing Operations Program

must describe the aircraft inspection procedures to be followed by its personnel.

According to the requirements of the Ground Icing Operations Standard, the air operator's Program must contain certain other basic elements, including an overall management plan to ensure proper execution of the Program, a description of the operator's aircraft inspection reporting procedures, and an outline of its training program and testing procedures. By stipulating the requirements for Ground Icing Operations Programs, the Standard also provides a basis for their approval by Transport Canada. In turn, the Programs, once approved, provide a basis for the fair and consistent surveillance by Transport Canada's inspectors of the conduct of ground icing operations at airports across Canada.

By creating *Air Regulation 540.2*, which stipulates unequivocally that contaminated aircraft are not allowed to take off; by providing guidelines for conforming to the new "clean wing" regulation; and by amending the original provisions of the Regulation, the requirements recommended by the Commission have not only been fulfilled, but the legal framework within which ground icing operations must take place in Canada has also been greatly strengthened.

### ***Mandatory Education and Awareness Programs***

However strong the prohibition against taking off in contaminated aircraft and however clear cut mandatory inspection and other procedures may be, unless everyone involved in ground icing operations is adequately trained, the requirements cannot be properly carried out. Recognizing the importance of strong education and awareness programs, the Commission made related recommendations that applied to everyone involved in flight operations.

In response, specific requirements for Surface Contamination Training were added to the Air Navigation Orders in November 1990 at the same time that *Air Regulation 540.2* was first enacted. This amendment requires air operators to "establish and maintain a training program approved by the Minister" to provide annual training to crew members and anyone designated to carry out inspections under the *Air Regulations*. The Order specifies that this training must include instruction on how to identify and report on surface contamination and how to inspect aircraft surfaces. It also requires the administration of "an examination, the results of which shall be recorded," to verify that the training has been understood and the trainee is able to apply its concepts. Furthermore, air operators must establish and maintain a safety awareness program on surface contamination for all other operations personnel.

In order to provide a basis for the development and approval of the required training programs, Transport Canada prepared a training package that it sent to all air operators and aviation industry associations in November 1990. This training package consisted of a training booklet, a video in three parts, and a series of examination questions. The first two parts of the video were geared to the information requirements of the flight crew, cabin crew, and operational staff of operators of large and small aircraft; the third part was geared to the ground crew and operations personnel of all types of operations.

The new training requirements contained in the Air Navigation Orders were further augmented by those of the Ground Icing Operations Standard that was enabled by the 1993 amendment of *Air Regulation 540.2*. Section 8 of the Standard outlines detailed training requirements that include the development of mandatory initial and recurrent training programs, the testing of personnel, and instruction in the following four major subject areas:

- the effect of contamination on critical surfaces,
- aircraft de-icing and anti-icing procedures,
- aircraft inspection and reporting procedures, and
- the use of hold-over time tables.

Additional recommendations emphasized the acquisition of specific practical knowledge, in particular with regard to the formation, removal, and prevention of ice; its effects on the aerodynamics of both jet- and propeller-driven aircraft; and the dangers of the "cold-soaking" phenomenon. These recommendations were submitted as part of the Commission's Final Report in March 1992, well over a year after the promulgation of the new Air Navigation Order governing surface contamination training. While Transport Canada's training package already required Surface Contamination Training Programs to cover the topics specified by these recommendations, the training requirements of the Ground Icing Operations Standard, added in 1993, further strengthened the training of operations personnel and, in November 1993, a new video entitled "Plain Talk about Ice" provided additional information.

The Commission was particularly concerned about what it termed "the insidious nature of the cold-soaking phenomenon". Fuel cools during flight at altitude, and when the aircraft is back on the ground, where temperatures are usually warmer, ice can form on the wing surfaces above and below the fuel tanks. Even if present in small amounts, this ice can interfere with the aircraft's aerodynamics. The Commission recommended that "a systematic and comprehensive discussion of cold soaking" be widely published in order to make all pilots and operations personnel aware

of this phenomenon as well as of the other factors "that may cause contamination to adhere to aircraft lifting surfaces." In response, the Task Group prepared a paper on cold soaking for pilots and maintenance personnel, and information based on this paper was given wide circulation in an Airworthiness Notice in June 1994 and in the *Aeronautical Information Publication* in July 1994. Material on cold soaking was also added to Transport Canada's de-icing/anti-icing training package, which was revised in 1994, and as of October 1, 1994, air operator Ground Icing Operations Training Programs must cover the phenomenon in both their training and examinations.

Together, the new Surface Contamination Training Programs that must now be provided by air operators, the additional training required by the Ground Icing Operations Standard, and the dissemination of comprehensive information on the cold-soaking phenomenon have dramatically increased the aviation community's awareness of the dangers of aircraft contamination.

### ***Airport Operations under Icing Conditions***

The response to recommendations contained in the First Interim Report improved safety through legislation that called for a fundamental change in attitudes and practices on the part of everyone in the aviation community. In contrast, the recommendations made in

the Commission's Second Interim Report concentrated mainly on particular problems in airport operations under ground icing conditions, identified in particular at Lester B. Pearson International Airport in Toronto. These recommendations were submitted just after promulgation of *Air Regulation 540.2* and the amendment of the Air Navigation Orders to require Surface Contamination Training; consequently, many of the problems they sought to rectify had already been partially or completely addressed. The subsequent amendment of the *Air Regulation* further improved the safety of ground icing operations. The specific nature of many of the recommendations related to airport ground icing operations means that they are more easily outpaced by technological change than those concerned with more basic issues.

At the time of the inquiry, most Canadian air operators, like their European counterparts, were using only Type I de-icing fluid to treat their aircraft. Since Type I fluid offers no protection against recontamination, the Commission recommended that Transport Canada strongly encourage air operators to begin using Type II anti-icing fluid for both their turbo-jet aircraft and propeller-driven aircraft. In early March 1991, Transport Canada issued a letter to all Canadian air operators advocating they use Type II fluids, and since there was no anti-icing fluid suitable for propeller-driven aeroplanes, it contracted for the necessary research to develop such a fluid. Research into the

development of an anti-icing fluid for propeller-driven aircraft continues and has made some progress. In addition, a Type III fluid, called Ultra, with a significantly longer hold-over time, has been developed and is currently being tested in the field.

Hand in hand with the application of anti-icing fluid comes the use of hold-over time tables to provide an estimate of the amount of time for which an aircraft will remain protected against recontamination. Transport Canada, in conjunction with the aviation industry, fluid manufacturers and testing facilities undertook an extensive program to develop hold-over times tables which are currently in use in North America. Work to improve these tables is ongoing. In the fall of 1990, Transport Canada also began issuing an Air Carrier Advisory Circular at the beginning of each ground icing operations season to disseminate the most recently available information on hold-over times to air operators.

During the course of its inquiry, the Commission found that, in adverse weather, there were often lengthy delays for departing aircraft at Pearson Airport and that, as a result, aeroplanes were taking off long after any protection afforded by Type I fluid had worn off. In order to address what was an important safety problem, the Commission recommended that gate-hold procedures be implemented at the Airport as a means of reducing departure delays. In December 1990,

Pearson Airport instituted a Departure Delay Program that is activated under ground icing conditions and minimizes the time delay between the de-icing/anti-icing of an aircraft and its departure. The Program provides regular estimates of the airport's capacity and a reduction in arrivals and departures based on the traffic flow rate that can safely operate under the prevailing weather conditions. Aircraft are held at the loading gates until they can go directly to the de-icing/anti-icing facility and then to take off to avoid allowing them to line up on the taxiways after treatment where they become recontaminated. This relatively simple measure has significantly improved the safety and efficiency of ground icing operations at Pearson Airport.

The Commission also recommended that de-icing/anti-icing facilities be constructed near the ends of runways to treat aircraft just before they take off. At the time of the Inquiry, de-icing/anti-icing facilities were located at Pearson Airport's three main terminals and at three other locations closer to the runways. In response, a de-icing/anti-icing facility was built at Taxiway Alpha near runway 24R in time for 1990-91 winter season, and a detailed analysis of the Airport's safety requirements under icing conditions was carried out by the Task Group. The study revealed that, given the current state of ground icing operations technology, a facility at Taxiway Delta to serve the two most frequently used

runways under icing conditions would greatly alleviate the problems associated with departure delays.

Essential to preserving and enhancing the safety of Canada's ground icing operations is a mechanism for identifying and resolving future problems as they arise. The Commission recommended the appointment of an appropriately qualified person to act as a national resource specialist in all matters related to aircraft surface contamination and ground operations under icing conditions. Because of the importance of obtaining the cooperation of everyone involved in these issues, it was decided that, rather than vest the responsibilities entirely in one position, it would be more effective to create a focal point for gathering the expertise and viewpoints of the different parties involved. As a result, the Standing Committee on Operations under Icing Conditions was formed. Composed of members from both Government and Industry, its mandate is to monitor the effectiveness of the regulations governing aircraft surface contamination; promote safe icing operations and airworthiness procedures; and disseminate the most recent information on de-icing and anti-icing operations. Its scope is deliberately broad and encompasses both airborne and ground icing, airport-related issues, research and development, aircraft operations, and training. The Standing Committee on Operations under Icing Conditions provides an effective

and dynamic mechanism for the exchange of information and the identification of emerging problems. It also complements the activities of the regional Aviation Safety Committees by providing another avenue to identify safety issues within the air transportation system and provide guidance to senior Transport Canada managers. The Standing Committee on Operations under Icing Conditions provides for the participation of all the constituents of the aviation community.

At the time of the Inquiry, Pearson Airport's facilities and procedures for capturing, recycling, and disposing of used de-icing and anti-icing fluids, which can be injurious to human health and harmful to the environment, were inadequate. To correct this problem, the Commission recommended that suitable equipment be maintained and appropriate procedures developed for the clean-up and disposal of de-icing and anti-icing fluids. In response, starting in 1992 and continuing over a three-year period, Transport Canada, in cooperation with Pearson Airport's air operators, installed a series of glycol collection facilities. These facilities included the construction of dedicated de-icing/anti-icing pads, underground collection tanks, holding ponds complete with diversion structures, catch basin inserts, piping to collect apron sub-surface drainage, and ditch liners to capture wind-blown glycol. Operational measures to reduce the amount of de-icing and anti-icing fluid run-off were also

implemented, which included the addition of specialized clean-up personnel, more efficient fluid dispensing methods, the use of glycol recovery equipment, and improvements to the glycol monitoring program.

The responses made to the recommendations related to airport operations under icing conditions have resulted in changes of both a particular and general nature. At Lester B. Pearson International Airport in Toronto, departure delays are no longer a safety concern under ground icing conditions, a new de-icing/anti-icing facility located closer to the runways has been built, and the construction of a runway-end de-icing/anti-icing pad to serve those runways most frequently used under icing conditions is planned. Of relevance to the conduct of all airport icing operations, the use of Type II fluids and hold-over time tables is now commonplace. Perhaps most important of all, the Standing Committee on Operations under Icing Conditions will provide an effective mechanism to ensure that, in the future, the safety of ground icing operations will continue to be improved.

## **Operational Control**

Of importance to Justice Moshansky was the whole area of operational control and the lack of standards and guidance for this very significant part of day-to-day air

operations. Legislation places several flight planning requirements on commercial air operators. For instance, an operational flight plan is required, which sets out the conditions under which the flight is to be conducted. The flight plan contains a flight release, important operational information, such as the planned alternate destinations, aircraft take-off and landing weights, fuel consumption, passenger loads, and other information necessary for the safe and orderly conduct of a flight<sup>11</sup>. These requirements fall under the title of operational control.

The recommendations on the subject of operational control are pivotal to preventing a recurrence of the circumstances that led to the Dryden accident and to improving aviation safety in Canada. As explained by the Commission:

Operational control is intended to provide support to the flight crew by ensuring that they have available to them full-time communications systems providing access to up-to-date information which permits them to make the safest possible operational decisions. The circumstances of the Dryden accident illustrate the key role of operational control within the transportation system, as well as the tragic results of a breakdown in that system.

Operational control is intended to prevent circumstances of the sort that occurred at Dryden, that is, the operation of an F-28 with an unserviceable auxiliary power unit (APU) into a station with no ground-support facilities, under conditions of forecasted freezing rain.<sup>12</sup>

Flight dispatchers are responsible for flight planning and monitoring the flight's progress; the latter is usually referred to as flight watch. In order to properly fulfil their duties, flight dispatchers must possess knowledge and expertise in a number of areas: these include meteorology, the air regulations, aircraft performance, fuel burns at various altitudes, load limitations for various atmospheric and runway conditions, and how to make certain complex mathematical calculations. The dispatcher must also be familiar with the company operations manual and the characteristics of the individual aircraft for which he or she is exercising operational control.

In response to the operational control-related recommendations made by the Commission, the implementation resulted in a number of initiatives and a series of interrelated measures. The terms "operational control" and "operations co-ordination" were clearly defined and differentiated from each other. Minimum requirements for the content of operational flight plans were also established together with associated procedures for their preparation to ensure

that operational flight plans are accurate and prepared in accordance with all applicable fuel, operating weight, and other requirements.

A standard setting the requirements for the operational control systems of air operators was developed. This standard divides operational control systems into four types based on the level of complexity of an air operator's operations. It sets out the responsibilities and authority of the pilot-in-command and flight dispatcher within each type of system and basic requirements governing the flight dispatch centre, communications, the release of a flight, the duties of and need to train flight dispatchers, and the flight watch or flight following system. The function of this standard is not only to outline the conditions that must be fulfilled by air operators in establishing and maintaining their operational control systems, but to provide a basis for monitoring the activities of flight dispatchers by Transport Canada's inspectors.

Included in this standard is a stipulation that air operators establish procedures to keep flight dispatchers informed of significant changes in flight conditions and at important stations along flight routes; a requirement to define the circumstances under which flight watch communication is mandatory; a provision that ground-handling agents must inform the flight dispatcher or the pilot-in-command of significant changes to aircraft passenger and freight loads as soon

as possible; the suggestion that air operators have back-up or alternate flight watch communications systems in place; and a clarification of the duties and responsibilities of the pilot-in-command and any position providing operational control assistance within pilot self-dispatch operational control systems. The Principles of Responsibility and Authority in Flight Operations and the definitions of the key terms related to operational control prepared are being incorporated into the new Canadian Aviation Regulations.

Integral to the safety of air operator operational control systems is the training of the flight dispatchers. The most significant implementation measure concerning operational control is that flight dispatchers be trained in accordance with a training standard set by Transport Canada and that they be certified in accordance with the requirements of this standard. All flight dispatchers will be required to complete generic training and to pass two examinations set by Transport Canada. In addition, air operators will be required to develop Transport Canada-approved flight dispatcher training programs that are appropriate to the level of complexity of their individual flight operations and system of operational control. In addition to specific training, air operators will also be required to provide their flight dispatchers with on-the-job training, cockpit familiarization, aircraft type transition training, competency checks, and recurrent training.

## **Cabin Safety**

The Commission made several recommendations that sought to improve cabin safety. These recommendations addressed the flammability of the interior of the passenger cabin, the safety of flight attendant seats, maximum flight times and flight duty times for flight attendants, and flight attendant duties and training.

### ***Cabin Interior Flammability Standards***

In the fire that followed the crash, many passengers suffered smoke inhalation or were severely burned by molten plastic falling on them from the cabin's interior. The Commission addressed these problems by recommending that Transport Canada adopt improved cabin interior flammability standards. During the 1980s, the United States Federal Aviation Administration developed improved flammability standards that were intended to retard the spread of fire, minimize smoke, and reduce the formation of toxic and flammable gases. These standards were designed with two goals in mind: to provide as much time as possible for people to escape from the aeroplane and to delay or prevent "flashover", a condition in which gases and other by-products of combustion accumulate in the upper portion of the cabin and reach a sufficiently high temperature that they ignite spontaneously.

In 1989, Transport Canada adopted these improved flammability standards for all newly designed aircraft and prepared separate legislation in order to make them applicable to aircraft designed before 1989. However, due to a legal challenge, it was never promulgated. Since the improved flammability standards recommended by the Commission already apply to aeroplanes whose design was approved after 1989, the implementation measures for this recommendation apply only to aeroplanes type certificated before 1989 — specifically, all newly manufactured aeroplanes type certificated between January 1, 1958 and 1989 and all in-service aeroplanes undergoing a substantially complete replacement of their interiors. Because of complications including aircraft design and availability of suitable replacement interiors for older aeroplanes, an improved, but more permissive, standard will apply to aeroplanes type certificated before January 1, 1958.

Concern was expressed that the term “substantially complete” had not been objectively defined. In response, the Executive Steering Committee, in order to avoid further delay, approved the implementation measures, but referred the task of defining the term “substantially complete” to a CARAC Technical Committee.

### ***Flight Attendant Seat Standards***

The Commission concluded that, had the flight attendants’ seats been equipped with shoulder harnesses and other safety-enhancing features now required for new aeroplanes, the flight attendants would have been better protected from injury. In response, Transport Canada published an interim order in July 1992 requiring that aircraft be equipped with lap belts and shoulder harnesses for flight attendant seats. In July 1994, the interim order was made permanent in the form of Air Navigation Order, Series II, No. 2.1.; however, analysis on the subject of additional safety-enhancing features required for aeroplanes manufactured since 1986 had not been completed by the DCIP. The additional issue of safety-enhancing seat features have now been addressed in clear, up-to-date standards for flight attendant seats that, with the promulgation of the Canadian Aviation Regulations, will apply to all seats occupied by Flight Attendants required by the operating rules.

### ***Flight Attendant Duties and Training***

In its gathering of evidence, the Commission found that there was no legislative requirement for air operators to produce a flight attendant manual or for it to be reviewed and approved by Transport Canada. Since a flight attendant manual is used to outline the required safety and emergency duties of flight attendants and to

provide guidance in their proper execution, the Commission felt that, in the interests of safety, air operators should be required to prepare these manuals and to submit them for approval to Transport Canada. In order to provide a basis for the preparation of these manuals by air operators and for their approval by Transport Canada, the existing Flight Attendant Manual Standard was extensively revised.

Testimony given before the Inquiry revealed that a number of passengers were concerned about the snow that had accumulated on the wings of C-FONF and that they had expressed their concerns to the flight attendants. Because the flight attendants assumed that the captain and first officer were aware of the extent of the contamination and there was a general reluctance by flight attendants to approach pilots on such technical matters, neither conveyed either her concerns or those of the passengers to the flight crew. *Air Regulation 540.2* now requires flight attendants to report the presence of any wing contamination they may observe to the pilot-in-command and the Flight Attendant Manual Standard now requires that the concerns of passengers be conveyed as well.

In its Initial Response to the Commission's recommendations, MCR 74, which recommended that Transport Canada proffer for enactment regulations setting training and competency requirements for flight attendants, was deemed to be complete because a flight

attendant training regulation was in effect at the time. The Cabin Safety Task Group, upon examining the Standard, concluded that improvements should be made and requested permission from the Project Advisory Committee to reopen MCR 74. Extensive research, consultations, and discussions lead to the development of a new, comprehensive Flight Attendant Training Standard that was consistent with the requirements of the Flight Attendant Manual Standard. The new training standard requires that initial, recurrent, aircraft-type, and requalification training be provided to flight attendants; it outlines the main subjects that must be covered for each type of training; and it increases the requirements for emergency drills and specifies the performance and evaluation criteria. Perhaps most important of all, the qualification and competency requirements for flight attendants and their instructors are now clearly defined. The Flight Attendant Training Standard has been well received and is being used as the basis for training programs even before officially coming into force through the new Commercial Air Services Standards (CASS).

In its examination of how human factors contributed to the Dryden accident, the Commission identified a serious lack of communication and coordination between the flight and cabin crews. It recommended that crew resource management training be required for both the flight and cabin crews, with particular attention paid to recognizing and reporting

contamination. The implementation measures developed in response to this recommendation require that annual training include both pilots and flight attendants and that combined evacuation drills be evaluated against the crew resource management principles. A CARAC Technical Committee will finalize the related Standard.

### ***Maximum Flight Times and Flight Duty Times***

One of the Commission's findings was that, although maximum flight times and flight duty times, including minimum rest periods, are specified in legislation for the flight crew, no such requirements exist for flight attendants. The flight and duty times of the flight attendants aboard C-FONF were below those prescribed for the flight crew; consequently, the Commission concluded that their judgement and ability to perform their duties were not impaired by fatigue at the time of the accident. Nevertheless, the Commission wished to see this legislative deficiency rectified and recommended that maximum flight times and flight duty times be prescribed for cabin crew members. The drafting of the applicable regulation and related standards has been confided to a CARAC Technical Committee.

Although the recommendations related to cabin safety are few in number, as a group their implementation will significantly improve aviation safety. By clearly

defining the duties and responsibilities of flight attendants, the Flight Attendant Manual Standard sets a minimum level of cabin safety, provides a guide to air operators in the preparation of their Flight Attendant Manuals, and establishes an objective basis by which their contents can be approved by Transport Canada. Since these duties and responsibilities cannot be fulfilled without adequate training, the Flight Attendant Training Standard serves as an important complement to the Flight Attendant Manual Standard. Both of these standards were developed in cooperation with the aviation community; consequently, their requirements are fully in keeping with the realities of day-to-day operations, which should increase compliance and ensure that air operators are not unduly burdened.

The training of flight attendants will be further strengthened by the addition of crew resource management training for both cabin and flight crews, some of which will take place through joint exercises. Better communication and improved coordination of duties in an emergency will help to prevent the recurrence of a situation in which a cabin crew member has a legitimate safety concern but does not voice it to the pilot-in-command. The enactment of a Regulation governing minimum flight times and flight duty times for flight attendants will help to ensure that fatigue does not impair cabin crew members in the performance of their duties. The improved cabin interior flammability standards and flight attendant seat

standards will do much to protect passengers and flight attendants in the event of an accident.

## **Safety Programs and Measurement Systems**

In order to improve the risk management of air operators and to ensure that vital aviation safety information is communicated directly to the chief executive officer (CEO) rather than being filtered through many layers of management, the Commission recommended that air operators be required to establish mandatory Flight Safety Programs. In response, the DCIP developed the basis for a Flight Safety Program Standard, the provisions of which air operators will be required to fulfil in developing their Flight Safety Programs. The Standard outlines the required training, qualifications, and responsibilities that an individual must possess in order to be allowed to manage the Flight Safety Program and provides a workable mechanism to ensure that important aviation safety information reaches the top levels of management of an air operator. In addition, a monitoring program to ensure air carrier conformance with the requirements of the Flight Safety Program Standard will be developed, and air operator Flight Safety Programs will be monitored as part of Transport Canada's regular air carrier inspection program.

Transport Canada uses regulations, standards, guidance material, and the dissemination of information to achieve its goal of maintaining a safe, efficient, and environmentally sound national civil aviation transportation system. Transport Canada also conducts and participates in ongoing research into ways of improving safety. As a result of its inquiry, the Commission identified a wide range of recommendations, most of which responded to specific problems. One recommendation addresses the more general need of assessing the effectiveness of the measures taken to ensure aviation transportation safety. In response, Transport Canada invited international experts in the field to an Aviation Safety Effectiveness Measurement Systems Workshop that was held in March 1994. The participants identified 11 research and development initiatives that they felt would most benefit from further research at this time; Transport Canada will participate in these R & D initiatives over the next few years as safety priorities dictate.

The Commission also recommended that Transport Canada establish Aviation Safety Committees at both the regional and headquarters levels and that they have direct access to the headquarters' operational aviation safety officer. The mandate of these committees, which have been reactivated, is to identify safety issues within the air transportation system and to provide guidance to senior Transport Canada managers in their implementation of corrective action. With one

committee per Region, each is chaired by the respective Regional Director General, Aviation, and its members include all Aviation Directors; the Regional Director General, Airports; the Director of Operations, Airports; the Unit Manager of the local Area Control Centre; and the Managers of International Airports or their designates.

## **Operations, Certification, and Approvals Process**

As the title suggests, this subject area covered a wide range of operational issues, including Minimum Equipment Lists, spare parts, operations manuals, ground-support facilities, cold soaking, the required qualifications for air operator managers, pilot training, and runway contamination. The implementation proposals made in response to these recommendations will substantially improve aviation safety.

Five recommendations were concerned with strengthening the requirements governing Minimum Equipment Lists (MELs), which allow the deferral of the repair of certain non-essential equipment. The legislation governing MELs has been clarified, and the new Canadian Aviation Regulations, for both the Airline and Commuter categories, will now stipulate that no commercial air operator will be permitted to

operate a given aircraft type<sup>13</sup> in commercial service unless it has an approved MEL.

The training requirements for the use of MELs for pilots, flight dispatchers, flight operations officers, and other key ground personnel involved in the operational control of flights have been strengthened, and flight crews must be informed of any repairs that have been deferred. In addition, the repair of an auxiliary power unit can now be deferred only if engine ground-start facilities are available at all the airports into which the aircraft is expected to operate.

Several individual recommendations were formulated to ensure that required ground-support facilities are available to an aircraft, and to maintain the safety of fuelling and de-icing/anti-icing operations while an aircraft has one or more engines running. In response, Transport Canada has made changes to requirements and issued technical information to air operators. Transport Canada has also disseminated technical advisory material on the cold soaking phenomenon, whereby the fuel contained in wing tanks becomes cooled during flight, causing the formation of ice on the wings once the aircraft is on the ground.

To ensure that air operators have a sufficient supply of spare parts on hand with which to repair their aircraft, Transport Canada will be requiring that air operators,

as part of quality assurance reviews, evaluate the efficacy of their spare parts supply system.

The Commission also made a series of recommendations related to the content of operations manuals and Transport Canada's approvals processes. In response, Transport Canada now requires that air operators have one company operations manual, that the provisions contained in the different sections of its operations manual are consistent with each other, that the manual properly coordinates the duties of cabin crew and flight crew, and where applicable, the various sections are cross referenced with each other. In addition, to emphasize the importance of adhering to special procedures during winter operations, Transport Canada now requires that operations manuals incorporate a statement indicating the air operator's intention to operate in accordance with paragraph 540.2 of the *Air Regulations* — the clean wing regulation. Transport Canada's requirements and procedures for the approval of operations manuals and ensuring the proper maintenance of aircraft have also been strengthened.

A number of recommendations were concerned with properly defining the duties, responsibilities, and qualifications of those air operator management positions that are mandatory. In response, the DCIP developed detailed criteria for the qualifications, knowledge and experience for the positions of

Maintenance Manager, Operations Manager, Chief Pilot, and Training Pilot.

Two areas of particular significance in this grouping are the recommendations dealing with pilot training and runway contamination.

### ***Pilot Training***

While there was no specific fault found in the training of the flight crew of flight 1363, the subject of pilot training requirements was found to be unclear in some areas and out of date. DCIP subjected the three recommendations related to improvements in the training of pilots to extensive study and consultation and the resulting proposals will lead to fundamental changes in how air operators train their pilots.

The new CARs have been developed to provide for more stringent requirements governing simulator training and line indoctrination as well as the addition of two new requirements: a consolidation period and crew pairing restrictions, which are to begin after successful completion of ground school training and the line indoctrination period. A consolidation period provides an opportunity for newly acquired knowledge to be mastered, and crew pairing restrictions ensure that, for a specific period of time, two pilots with limited experience on an aircraft type are not paired on the same flight.

Related to these changes in training requirements is a modification in Transport Canada's policy governing the use of foreign-licensed pilots for training and checking purposes. The policy has been simplified, the use of foreign-licensed pilots for checking will now be allowed when a qualified person is not available in Canada, and Transport Canada will continue to encourage air operators to use highly experienced pilots from outside the company for training purposes, when necessary.

### ***Runway Contamination***

Just as the condition of roadways greatly influences the handling of a motor vehicle, runway conditions affect the take-off and landing performance of an aeroplane. A runway contaminated by water, ice, slush, or snow<sup>14</sup> affects an aeroplane's rate of acceleration or deceleration and require greater take-off and stopping distances. Because C-FONF took off from a runway that was contaminated with water and snow, the Commission examined the requirements governing operations on contaminated runways and, in a series of recommendations, addressed what it considered to be important weaknesses in the safety system.

An aeroplane's performance, when taking off from a bare and dry runway, is a function of its weight and configuration as well as the air temperature, barometric pressure, and wind conditions. These factors, along

with the runway's length and any appreciable runway gradient, are taken into account when an aeroplane's maximum permissible take-off weight is calculated before the flight by the pilot or dispatcher. A fundamental requirement of this calculation is that the runway be, not only long enough for the aeroplane to take off from, but able to provide a balanced field in the event of an engine failure on take-off. A balanced field is defined as that length of runway which, following acceleration of the aircraft to a pre-determined decision airspeed, assumes an engine failure at that point, and allowing time for the crew to react, permits the aircraft to either continue on one engine and take off successfully or brake to a stop at the end of the runway. Calculating a balanced field length for a bare and dry runway is relatively straightforward; however, no standard method exists for making this calculation for an aeroplane about to take off from a contaminated runway.

While some Aircraft Flight Manuals contain information for operating on contaminated runways, there is no legislation in Canada or any other country that requires manuals to contain this material. The Commission recommended that both Aircraft Flight Manuals and Company Operations Manuals<sup>15</sup> contain guidelines for operating on contaminated runways and that this material be approved by Transport Canada. Although an extensive study was conducted by the DCIP Task Group into this matter, additional research is needed,

therefore, the DCIP confided the development of a regulation requiring that Company Operations Manuals contain information for operating on contaminated runways to a CARAC Technical Committee, which will also develop the necessary standards with the understanding that the eventual decisions of other countries will be taken into account.

Since a scientific basis for the required standard was lacking, the Commission also recommended that Transport Canada, in cooperation with aircraft manufacturers and air operators, conduct research into "a technically accurate means of defining runway surface conditions and their effects on aircraft performance." Information on current and future research activities will be reviewed by the Standing Committee on Operations Under Icing Conditions and further research priorities will be identified.

When the Commission examined the training requirements for operating on contaminated runways, it found there were none. In response, a requirement for flight crews to be given suitable training will also be incorporated into the Canadian Aviation Regulations.

In order to ensure that Canada's eventual legislation for operating on contaminated runways is not onerous for Canada's aviation industry to abide by, Transport Canada will actively participate, with manufacturers, air operators, and other civil aviation authorities, in

international fora to harmonize our standards governing contaminated runways with those of other countries, where possible.

## Surveillance

Inadequate surveillance of air carrier operations during the 1980's was another concern identified by the Commission and was determined to result from two areas: inadequate resources to conduct the surveillance program; and, inadequate or ambiguous associated policies, procedures and regulations.

In the first case the Commission recommended more extensive delegation of authority to the industry to alleviate the resource intensive activities of monitoring the day-to-day operations of air carriers such as conducting pilot proficiency checks. These recommendations also sought to strengthen the safeguards already in place for ensuring that delegation of authority is not misused and that safety standards continue to be properly applied and maintained.

In response, further delegation will be given to Company Check Pilots to conduct initial and upgrade checks, initial pilot proficiency checks, initial instrument rating tests and some category endorsements. The companies are authorized such delegation provided they have a mature program for training and checking

pilots and meet specified low risk criteria. Guidelines with respect to conflict of interest have been put in place for use in evaluating individual candidates for the position of Company Check Pilot. Transport Canada is also evaluating the feasibility of establishing a freelance CCP program which would allow individuals to perform CCP duties for companies for which they are not employed.

To resolve the second area of concern the recommendations focussed on Transport Canada providing the necessary tools to oversee the system. In this respect one of the major areas addressed was the revision of the aviation audit policy and the strengthened National Audit Program. A comprehensive training program has been established for Audit Inspectors and Audit Team Managers along with a policy which states that individuals cannot serve in either of these capacities unless the requisite training has been taken. An audit/inspection schedule has been established which specifies that individual air carriers be audited over a period of one to three years and in exceptional cases extension to five years is permitted. This schedule is determined for each carrier based on risk factors (i.e. the higher the risk the more frequent the audits). The audit program also encompasses monitoring the performance of the additional delegated authorities, for example, to Company Check Pilots.

The Manual of Regulatory Audits was issued in December 1991 and has now been extensively revised to incorporate the changes approved through the DCIP.

Related to the surveillance task is one recommendation that required the implementation of an inspector training policy. A comprehensive inspector training policy has been developed and is now the basis of improved training for Transport Canada's inspectors. It includes the required technical training for Headquarters and Regional regulatory specialists to perform their duties competently.

To summarize the effect on aviation safety these implementation measures must be considered with many other measures which provide more tangible support for the surveillance program such as improved training standards for pilots, flight attendants and dispatchers, and the increased knowledge and awareness of the hazards of operations under icing conditions.

## Ground-Handling

Several recommendations were made by the Commission which were considered under the general heading of ground handling. These were congestion at Lester B. Pearson International Airport, runway maintenance and fuelling operations.

In the Commission's opinion, departure delays at Pearson Airport were caused in part by traffic congestion on the ramp and recommended in December 1990 that, if feasible, the existing ramp space at Pearson Airport be increased. In February 1991, as part of a project unrelated to this recommendation, Terminal 3 was built, which added 28.5 hectares of apron space and 27 gates. In addition, three new runways, along with their supporting taxiways, are expected to be completed by the year 2005, further increasing the Airport's existing capacity. The Task Group evaluated the Airport's future needs and concluded that, with the Departure Delay Program in place, the plans to build a runway end de-icing pad, the improved efficacy of de-icing/anti-icing operations, and the additional ramp space provided by the construction of Terminal 3, it was not necessary to increase ramp space beyond that projected as part of the construction of the three new taxiways. In order to prevent future ramp congestion problems from occurring, the Airport's traffic patterns will be assessed again once the construction of the three new taxiways is complete.

The ground icing operations at Canada's other major airports were surveyed and it was determined that, at the time, they were not experiencing significant departure delays that would jeopardize safety under adverse weather conditions.

In order to address the full gamut of factors that influence the safety of taking off from a contaminated runway, the Commission also recommended that, in cooperation with airport operators, Transport Canada seek "more efficient methods of ensuring that runways are maintained free of contaminants." Although already well advanced in the use of state-of-the-art technology in runway maintenance, Transport Canada, in cooperation with industry, is involved, on a continuing basis, in efforts to develop more efficient devices, chemicals, and procedures for the rapid removal of contaminants from airport runways. It is also a regular and prominent participant in international organizations dealing with the full spectrum of issues involved in runway maintenance.

The Commission found irregularities in the fuelling practices used when the Fokker F-28 aircraft was refuelled before its departure from Dryden Municipal Airport. In response to the Commission's recommendation to prohibit refuelling with an engine running and passengers on board, boarding, or deplaning, Transport effected a regulation in late 1990.

The refuelling practices did not contribute to the Dryden crash; however, the Commission interpreted its mandate broadly to include any derivative matters that affect aviation safety<sup>16</sup>. Consequently, a number of other recommendations were made addressing aviation fuelling.

The DCIP reviewed the fuelling procedures normally followed at Canadian airports; the current fuelling standards and training programs of the major fuel suppliers; Transport Canada's fuelling policies governing the airports it owns, operates and subsidizes; and the monitoring of aviation fuelling operations at Canadian airports.

Transport Canada will ensure that aviation fuelling operations are regularly and systematically monitored, subject to the same risk analysis as the other elements of its aviation surveillance program. Aviation fuelling standards that are being incorporated into the Commercial Air Services Standards include requirements for the quality control, storage, handling, and dispensing of aviation fuel. In addition to Transport Canada's "Policy and Standards on the Storage, Handling, and Dispensing of Aviation Fuel at Transport Canada-Owned Airports" (TP2231), technical information and training guidelines will be prepared and distributed to private and commercial air operators, fuel supply companies, fuel-handling agents, airports and aerodromes. These two documents will be consistent however the latter will ensure a wide distribution of information to allow everyone involved in aviation fuelling to be fully informed of the applicable principles, practices, and procedures.

## Emergency Response Services

As a result of its evaluation of Dryden Municipal Airport's emergency response, the Commission made recommendations to improve the emergency response services provided at Canadian airports. In response, Transport Canada's training programs for its fire-fighters and fire officers have been revised to improve their overall quality and to take into consideration specific problems identified by the Commission. In particular, the emergency response services training standard now includes requirements that some emergency response exercises should be carried out during winter weather conditions and off the airport's property; it also requires better preparation of fire-fighters for dealing with the realities of an air crash. In addition, instruction on emergency communications and coordination procedures has been strengthened.

Transport Canada also increased its monitoring of emergency response training and exercises at Transport Canada-owned, operated, and subsidized airports and improved its procedures for ensuring that subsidized airports have up-to-date emergency response plans and procedures manuals in place. In addition, new requirements for the preparation of emergency response plans will ensure that they clearly define the areas of jurisdiction for the airport and surrounding municipal response teams, particularly in the Critical Rescue and Fire-fighting Response Area and that they are

comprehensive, practicable, and properly coordinated with the emergency response plans of all parties involved.

A guideline on the objective and rigorous conduct of post-accident reviews and post-exercise debriefing sessions is being prepared. The purpose of these reviews is to identify the strengths and weaknesses of an airport's emergency response plan and to disseminate information to other emergency response services units across the country on the effectiveness of new and traditional approaches to emergency response operations.

In the event of an emergency, air operators will be required to provide information on the number of persons on board, the quantity of fuel on board, and any hazardous cargo on board the aircraft. In response to the Commission's recommendation that aircraft crash charts be distributed to all airports, including those not owned, operated, or subsidized by Transport Canada, crash charts have been distributed to all airports that handle scheduled commercial passenger traffic and made available to airports and aerodromes that do not handle commercial air traffic.

Most significant to improving and maintaining the quality of emergency response services is that Transport Canada has decided to enact regulations and an associated standard identifying the criteria for where

emergency response services must exist and governing the training of emergency response personnel and the conduct of their operations. This legislation will apply at all airports with emergency response services, regardless of whether they are private airports or owned, operated, or subsidized by Transport Canada.

## **Government Issues**

In reviewing the regulator, the Commission identified several problem areas — lack of adequate resources within the Aviation Regulation program, a cumbersome organizational structure in Transport Canada, and a slow regulatory process for amending safety rules. Therefore, the Commission's recommendations sought to improve the use of departmental resources, ensure a sound communication and organizational structure within Transport Canada, and focus attention on the importance of maintaining clear and up-to-date safety regulations. During the course of the Inquiry the Commission also recorded specific concerns about the accident investigation process and problems encountered with specific parts of the *Inquiries Act*.

### ***Resources and Organizational Structure***

The Commission made several recommendations centered on the management structure in place in the 1980's mandated to review and make resource

decisions. The Commission's concern was the issue of appreciation for the priority of safety related activities and whether senior management was aware of resource decisions that impacted on aviation safety. There is now a new management structure in place. The Transport Management Executive (TMX), headed by the Deputy Minister, is the body that makes resource decisions. The Assistant Deputy Minister, Aviation, provides the technical advice on aviation matters during discussions and the Deputy Minister is kept fully informed of safety impacts. This ensures that appropriate attention is given to safety at a senior management level and priorities are established commensurate with the program demands and resources available.

Other initiatives have been instituted such as risk management to ensure efficient use of available resources. Directly related to this initiative is the decision to make activities associated with the surveillance of the air carrier industry, such as in-flight inspections, non-discretionary. This together with the bi-annual priority setting meetings within the Aviation Regulation program, will ensure that the aviation industry is effectively monitored.

Concern was also expressed by the Commission about the division of roles and responsibilities within Transport Canada particularly between the Aviation

and Airports Groups and to a lesser extent between Headquarters and the Regions.

As an immediate response to these concerns Regional Director General positions were established at each of the six Regional offices to amalgamate the functions within the Aviation organization. This facilitated a single point of contact within each Region for the resolution of Aviation concerns by air carriers.

Also Transport Canada acknowledged that the position of Director General, System Safety, through a memorandum of understanding between the Aviation and Airports Groups, assumed responsibility for all aviation safety matters.

The remaining organizational issues, particularly those related to amalgamation of the Aviation and Airports Groups under one head, have been under review within the department over the past several years. Integral to these considerations have been initiatives to commercialize air navigation services, devolve many of the airports operated by Transport Canada to local airport authorities and generally transform Transport Canada into a more streamlined regulatory body.

### **Rules**

The Commission expressed great concern over the inattentive nature of the regulatory process to urgent

safety amendments and also the ambiguous and out-of-date rules and regulations. As stated earlier, several regulatory initiatives have been simultaneously undertaken in addition to the DCIP and the Regulatory Renewal Project, which is in the process of rewriting and amalgamating the *Air Regulations* and the *Air Navigation Orders*, is also incorporating the legislative changes approved through the DCIP.

When promulgated, the new regulatory framework will consist of the Regulations, which lay down clear and concise rules, and enabled Standards, which will have the force of law. In an attempt to reduce regulatory delays, the CARs have been structured so as to minimize the Regulations, which are relatively difficult and time consuming to amend, and to provide as much information as possible in the Standards, which can be revised much more easily. In addition to the Regulations and their accompanying Standards, Guidelines will also be published, when necessary, to provide information of a non-regulatory nature to the users of the CARs.

Central to improving the quality and speed of processing regulations and standards has been a senior aviation management committee, which establishes regulatory priorities, and a PCO (Justice) satellite team dedicated to review and approve aviation safety regulations under the *Statutory Instruments Act*. These were established in 1992 and have been effectively used

to implement regulatory proposals emanating from the DCIP.

### ***Transportation Safety Board and Privy Council Office***

Several recommendations were made by the Commission with respect to the conduct of accident investigations by the Transportation Safety Board. The majority of these were aimed at revising the *CTAISB Act* and dealt with areas such as participants in the investigation of an accident, availability of witness statements, access to investigation reports, and follow-up on safety recommendations. While there has been no disagreement with the intent of these recommendations, it has been decided that they will be considered along with other similar issues raised by the CTAISB Review in an appropriate legislative revision cycle. In the meantime, a few more specific recommendations resulted in the following actions:

- The TSB agrees fully with the importance of giving full consideration to possible human factors aspects of aviation accidents and the agency has devoted considerable attention to developing its capability to investigate the human factors aspects. A human factors unit has been established at the head office and human factors training has been provided to field investigators and head office safety analysts.

- Following agreement at the International Civil Aviation Organization (ICAO) Accident Investigation Group, amendments are now being made to ICAO's Manual of Aircraft Accident Investigation to ensure states look more deeply into organizational and management factors and include pertinent organizational and management information in the Final Reports following aviation accidents.
- The Board also recognizes the benefits of taking advantage of expertise in Canada and abroad, as well as access to facilities and staff of such institutions as the National Research Council. The TSB will continue to make use of private industry and other expertise to the extent that it can without compromising the independence of its investigations.

One recommendation was aimed at revising the *Canada Evidence Act* provisions concerning the "confidence of the Queen's Privy Council" and one recommendation was aimed at amending the *Inquiries Act* to assist in its interpretation. The Government will consider the recommended amendments in the future should a decision be taken to pursue other amendments to the *Canada Evidence Act* or the *Inquiries Act*.

### **Summary**

In summary, the DCIP acknowledged that Transport Canada must ensure that adequate resources are

devoted to surveillance activities, that surveillance is focused on the areas of highest risk, and that Transport Canada's higher levels of management are promptly informed of any resource shortfall that could have a direct impact on aviation safety. Recent organizational changes were identified and Transport Canada will ensure that its organization is conducive to the fulfilment of its mandate with regard to aviation safety in any future organizational structure. The new CARs and the mechanisms in place to handle safety amendments will fulfil the requirements of the Commission's recommendations.

### **Research and Development**

The recommendations aimed at Research and Development fall into four separate areas: de-icing/anti-icing technology, contamination detection sensors, runway contamination, and flight data recorders. Most of the recommendations in the other subject areas were made to address particular problems identified by the Commission that could be dealt with through specific initiatives, such as changes to legislation and procedures. Because of the nature of research and development work, which builds on past efforts and provides a foundation for future endeavours, the Commission's R & D recommendations are broader in focus and required an approach geared to the long term.

The Task Group, whose members represented the aviation industry, government agencies, and academic institutions, developed a research plan in response to these recommendations and allocated a series of research and development contracts to the private sector. The plan focussed initial efforts in the areas of de/anti-icing fluids and ice detection sensors.

Extensive research has been conducted to establish how long anti-icing fluids will be effective under different weather conditions; this work is extremely important to air operators in Canada and in other countries with winter weather conditions such as ours, because they use hold-over time tables as a guideline to gauge when anti-icing fluid will break down. In addition, the DCIP commissioned work on the cold-soaking phenomenon, alternate approaches to the de-icing of aircraft, the effect of ice on the aerodynamics of aircraft, and the development of advanced anti-icing fluids.

A survey was conducted that identified 12 airborne contamination detection devices and 3 lift loss sensors and that assessed their levels of market readiness. The DCIP participated in the testing of one of these systems and provided funding to help in the development of another. Since several of the devices surveyed were about to be made commercially available and others were well along in their development, the DCIP concluded that it was unnecessary for Transport Canada to fund further research on airborne sensors.

Through membership on various international committees, in particular the Society of Automotive Engineers which has established a sub-committee to study ground ice detection systems, the DCIP shares its research results with other countries and keeps up to date on related research.

Research has also been conducted to improve the safety of operations on wet and contaminated runways. Projects have included studies of the dispersion of water droplets and anti-icing fluid in the wakes of aircraft and on the runway.

Flight data-recording systems, which are commonly referred to as the "black box," consist of two separate pieces of equipment. As explained by the Commission, the cockpit voice recorder (CVR) "records all conversation and other sounds generated within or reaching the cockpit and radio conversations with outside agencies." The flight data recorder (FDR) captures information such as the aircraft's heading, speed, attitude, altitude, acceleration, engine thrust, and whether the autopilot is on or off.<sup>17</sup> As the recorders of the C-FONF were destroyed, the Commission made recommendations directed at research in the areas of survivability, deployability and optimum locations.

Transport Canada and the Transportation Safety Board are actively involved in several international organizations, such as the European Organization for

Civil Aviation Equipment (EUROCAE), whose goals include improving the survivability of flight data-recording systems. Further research is planned to determine the optimal location for such systems, as well as the possibility of downloading flight data to an external recipient.

Research is a continuing and evolving process and Transport Canada's Standing Committee on Operations Under Icing Conditions will be reviewing the future plans related to these subjects to prioritize research projects and make funding recommendations.

## **Conclusion**

The Commission submitted its recommendations in the Spring of 1992 three years after the accident had occurred. The implementation process itself began soon after the accident and will continue into the foreseeable future. As the time required to accomplish each phase of this extended task passes, the air transportation system continues to evolve, and future changes may require that additional measures be taken in response to new circumstances. In addition to the measures themselves, fundamental lessons have been learned from the Dryden accident and the subsequent Inquiry. These lessons have become a part of the unofficial body of knowledge that accumulates within organizations. With the attention that has been given to

analyze these recommendations and the broad participation of labour, industry and government, these lessons will be passed on and continue to influence the decisions and behaviour of those responsible for the safety of the air transportation system.

## Endnotes

<sup>1</sup>The Honourable Virgil P. Moshansky, *Commission of Inquiry into the Air Ontario Crash at Dryden, Ontario*, Final Report, Volume I, (Ottawa: Supply and Services Canada, 1992), p. 4.

<sup>2</sup>An Air Operator is anyone who has been issued an air operator certificate by the Minister of Transport. This certificate authorizes the person or organization in question to transport cargo and fare-paying passengers. The Commission used the term "air carrier" where we use "air operator."

<sup>3</sup>The sections summarizing the events and circumstances surrounding the Dryden accident have been based on the information presented on pages 15 to 100 of Justice Moshansky's Final Report. Only where material is directly quoted will references be provided.

<sup>4</sup>Moshansky, p. 65-67.

<sup>5</sup>Moshansky, p. 68.

<sup>6</sup>At the time of the Dryden accident, the term "crash, fire-fighting, and rescue" was in use and has since been replaced by "emergency response services." Although the Commission's recommendations employ the former term, the latter will be used throughout this report.

<sup>7</sup>"Transport Canada Crash, Fire-fighting, and Rescue Services Standards," (TP 3660), January 1984, p. 1.

<sup>8</sup>Moshansky, p. 130.

<sup>9</sup>Moshansky, p. 381.

<sup>10</sup>Critical surfaces are defined by the *Regulation* to mean "the wings, control surfaces, rotors, propellers, horizontal stabilizers, vertical stabilizers or any other stabilizing surface of an aircraft and, in the case of an aircraft that has rear-mounted engines, includes the upper surface of its fuselage."

<sup>11</sup>Air Navigation Order Series VII, No. II

<sup>12</sup>Moshansky, p. 687.

<sup>13</sup>All aircraft types where a Master Minimum Equipment List (MMEL) exists will be required to have an approved MEL.

<sup>14</sup>In its Final Report, the Commission defined a contaminated runway as "when more than 25 per cent of its surface, within the required length and width being used, is covered by surface water greater than 3 mm (0.125 inch) deep, or by slush or loose snow equivalent to more than 3 mm of water" (Moshansky, p. 360).

<sup>15</sup>An Aircraft Flight Manual is a document provided by the aircraft's manufacturer that, depending on its certification basis, is approved in whole or in part by Transport Canada. Similar to a car owner's manual, it describes the aircraft, outlines its performance limitations, includes emergency instructions, and provides other basic information necessary for its operation.

By law all air operators are required to prepare a Company Operations Manual for the use of their operations personnel. Its minimum contents are stipulated in legislation and must be approved by Transport Canada. The Operations Manual outlines how the air operator will operate its aircraft; coordinate its crew procedures; provide operational support such as flight dispatch, flight release, enroute operation, and training; manage its operations; maintain its aircraft; and generally ensure a safe and orderly operation. The Manual serves as a contract between Transport Canada and the operator and is used by inspectors as a standard against which to measure the safety of an air operator's day-to-day operations.

<sup>16</sup>The Honourable Virgil P. Moshansky, Commission of Inquiry into the Air Ontario Crash at Dryden, Ontario, Final Report, Volume I (Ottawa: Supply and Services Canada, 1992), p. 4.

<sup>17</sup>Final Report, p. 253

LIST OF PARTICIPANTS

Aerospace Industries Association of Canada (AIAC)  
Air Alliance  
Air BC  
Air Canada  
Air Ontario  
Air Transport Association of Canada (ATAC)  
Aircraft Maintenance Engineers Association (AMEA)  
Aircraft Operations Group Association (AOGA)  
Airport Management Conference of Ontario (AMCO)  
Association Québécoise des Transporteurs Aériens, Inc.  
(AQTA)  
Atlantic City Technical Centre  
Atmospheric Environment Service  
Aviation Research Company  
Bombardier Canadair Division  
Bombardier de Havilland  
Bradley Air Services  
Canadian Airline Dispatchers Association (CALDA)  
Canadian Air Line Pilots Association (CALPA)  
Canadian Air Traffic Control Association (CATCA)  
Canadian Airlines International Limited (CAIL)  
Canadian Business Aircraft Association (CBAA)  
Canadian Union of Public Employees (CUPE)  
Consolidated Aviation  
Department of National Defense (DND)  
Federal Aviation Administration

First Air  
Hudson General  
Imperial Oil (ESSO)  
Institute for Aerospace Science  
Instrumar  
International Association of Machinists (IAM)  
Justice Canada  
Montreal Airports Authority  
Montreal IAP  
Nationair  
National Research Council of Canada (NRC)  
Ontario Express  
Time Air  
Transport Canada  
Transportation Association of Canada (TAC)  
Union Carbide  
Union of Canadian Transport Employees (UCTE)  
University of Québec at Chicoutimi  
Voyageur Airways



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## Part III

### Implementation Measures

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## Part III: Implementation Measures

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### Introduction

In his Final Report of the Commission of Inquiry into the Air Ontario Crash at Dryden, Ontario, the Honourable Mr. Justice Virgil P. Moshansky made 191 recommendations to which the government committed serious and careful consideration. This Part lists each of the Moshansky Commission Recommendations (MCRs), identifies that the MCR is considered implemented or, describes, using excerpts from the Task Group reports, the exact implementation measures agreed to through the DCIP process. The action to be taken in response to the 191 MCRs is varied and extensive. Implementation activity began before the Commission's Final Report was released and will continue in some areas well into the future. With the restructuring of the aviation regulations, standards and guidelines together with associated amendments of departmental policies and procedures, the implementation activity is achieved in stages and will be tracked in detail in a separate document. For the purpose of this report, therefore, the status has been identified under two general headings: **Implemented** or **Under Way**. The following definitions will give an understanding of the criteria used to categorize the present implementation:

#### **Implemented:**

Those implementation measures that:

- are fully complete;
- have been incorporated into draft regulations or manuals and will be promulgated in the new Canadian Aviation Regulations and associated standards or issued on the next amendment cycle of a particular manual; or,
- will continue as an ongoing activity.

#### **Under Way:**

Those implementation measures:

- not yet incorporated into regulations and standards; or,
- awaiting consideration under formal legislative amendment cycles (e.g. Aeronautics Act, Inquiries Act).

Transport Canada is committed to tracking the specifics of each implementation measure and to continuing to keep interested Project participants and Justice Moshansky fully informed of the implementation status. Industry and Labour groups will once again contribute to this process.

## Part III: Implementation Measures

Recommendations	Implementation Measures
<p>MCR 1</p> <p>The Department of Transport prohibit the refuelling of an aircraft with an engine operating when passengers are on board, boarding, or deplaning.</p>	<p>MCR 1</p> <p>A regulation giving effect to this recommendation was published in <i>Canada Gazette</i>, Part II on September 12, 1990.</p> <p>Further amendments and improvements have been accomplished in the areas of air operations under icing conditions (see Part II - Aircraft Contamination).</p> <p><b>Status: Implemented.</b></p>
<p>MCR 2</p> <p>The Department of Transport immediately develop and promulgate an Air Navigation Order applicable to all aircraft that would prohibit take-offs when any frost, snow, or ice is adhering to the lifting surfaces of the aircraft, and the Department of Transport provide guidelines to assist aviation personnel in conforming to the amended orders.</p>	<p>MCR 2</p> <p>An amendment to the <i>Air Regulations</i> giving effect to this recommendation was published in <i>Canada Gazette</i>, Part II on November 21, 1990. The guidelines to aviation personnel were published as an Aeronautical Information Circular (AIC) in August 1990 and incorporated into the Aeronautical Information Publication (AIP) in October 1990. Air Carrier Advisory Circular No. 0018 was sent to all Canadian carriers in September 1990.</p> <p>Further amendments and improvements have been accomplished in the areas of air operations under icing conditions (see Part II - Aircraft Contamination).</p> <p><b>Status: Implemented.</b></p>

### Part III: Implementation Measures

Recommendations	Implementation Measures
<p><b>MCR 3</b></p> <p>The Department of Transport forthwith develop and implement a mandatory and comprehensive education program for all aircrew engaged in commercial operations, including an integrated program for cockpit crew members and cabin crew members, on the adverse effects of wing contamination on aircraft performance, with provision for knowledge verification; and</p> <p>The Department of Transport similarly develop and implement a mandatory safety-awareness program for all other personnel involved in flight operations, including managers, dispatchers, and support personnel, on the adverse effects of wing contamination on aircraft performance.</p>	<p><b>MCR 3</b></p> <p><b>Training Package</b> - A Transport Canada approved surface contamination training package was sent to all Canadian air carriers on November 8, 1990 and aviation industry associations and corporate operators on November 9, 1990. The package included one video in three parts; one each for small aircraft, large aircraft and ground personnel. As well, there was a companion user-guide booklet and a series of examination questions to assess knowledge verification for crew members.</p> <p><b>Mandatory Program</b> - Amendments to the applicable Air Navigation Orders addressing surface contamination training were published in the <i>Canada Gazette</i>, Part II on November 21, 1990. In addition, Air Carrier Advisory Circular No. 0019, addressing the mandatory education and awareness program, was sent to all Canadian carriers in September 1990.</p> <p>Further amendments and improvements have been accomplished in the areas of air operations under icing conditions (see Part II - Aircraft Contamination).</p> <p><b>Status: Implemented.</b></p>
<p><b>MCR 4</b></p> <p>The Department of Transport immediately develop and implement, in consultation with the Canadian Aviation industry, a system of mandatory inspection of an aircraft to be carried out by the pilot in command or his designate, or other qualified company personnel, to ensure that the aircraft's critical surfaces are clean before take-off.</p>	<p><b>MCR 4</b></p> <p>The amendment to the <i>Air Regulations</i>, noted in MCR 2, also includes the mandatory inspection of an aircraft for contamination of critical surfaces.</p> <p>Further amendments and improvements have been accomplished in the</p>

### Part III: Implementation Measures

Recommendations	Implementation Measures
<p>In the event that a member of the cabin crew, based on his or her observation, reports a concern regarding wing contamination to the pilot in command, it shall be the duty of the pilot in command to check the wing condition either personally or through another member of the cockpit crew before take-off.</p> <p><b>MCR 5</b></p> <p>Transport Canada should, on a priority basis and in cooperation with major Canadian air carriers, implement interim runway-end de-icing/anti-icing facilities at Pearson International Airport. The target should be to have the first of such facilities in place on an interim basis as early as possible in the 1990-91 icing season. Subsequent permanent installations should be designed and constructed to satisfy both safety and environmental concerns.</p> <p><b>MCR 6</b></p> <p>Transport Canada should examine and, if feasible, implement air traffic control gate-hold procedures at Pearson International Airport as a means of reducing departure delays during conditions of freezing precipitation.</p>	<p>areas of air operations under icing conditions (see Part II - Aircraft Contamination).</p> <p><b>Status: Implemented.</b></p> <p>For MCR 5 See MCR 15</p> <p><b>MCR 6</b></p> <p>Transport Canada, in cooperation with the industry, has implemented gate-hold procedures during conditions requiring de-icing/anti-icing. These procedures will continue to be put into effect when required until all permanent de-icing and anti-icing facilities are in place.</p> <p><b>Status: Implemented.</b></p>

### Part III: Implementation Measures

Recommendations	Implementation Measures
<p>MCR 7</p> <p>In addition to the already announced feasibility studies for two new runways and supporting taxiways at Pearson International Airport, Transport Canada should investigate and, if feasible, proceed to implement an expansion of existing ramp space on the airport to reduce congestion and consequent departure delays. This undertaking should be given high priority.</p>	<p>MCR 7</p> <p>It is proposed that the plans, outlined as follows, to build additional taxiways and runways at LBPIA will increase existing ramp capacity, minimize congestion, and reduce departure delays.</p> <p>The addition of taxiways and runways at LBPIA will be carried out in three phases. Phase 1 is due to begin in the spring of 1994 and will include the building of the proposed northwest-southeast runway and the dual-lane taxiway around Terminals 1 and 2. In order to minimize the impact of this construction on airport operations, the work will be carried out in several stages; as a result, phase 1 will require four to five years to complete.</p> <p>Phase 2, which will consist of a new northeast-southwest runway and supporting taxiway, will begin only after completion of phase 1 and will take approximately three years. Phase 3, which will add another northeast-southwest runway and taxiway at the other side of the airport, will also take three years. Because phases 2 and 3 are intended to accommodate an increase in air traffic, their construction will not begin until air traffic forecasts indicate a need for them. Current expectations are that all three phases will be completed by the year 2005.</p> <p>Transport Canada will periodically evaluate traffic patterns at LBPIA to assess the effectiveness of these new runways and taxiways in reducing traffic congestion and departure delays.</p> <p><b>Status: Under Way.</b></p>

### Part III: Implementation Measures

Recommendations	Implementation Measures
<p>MCR 8</p> <p>Transport Canada should strongly encourage and support the use by Canadian air carriers of type II anti-icing fluids that meet AEA specifications for turbo jet aircraft and, where applicable, for propeller-driven aircraft.</p> <p>MCR 9</p> <p>Transport Canada should, in the interest of employee safety and in order to facilitate reliable inspection of aircraft surfaces after de-icing/anti-icing, ensure that adequate and sufficient exterior lighting exists in all gate and ramp areas where de-icing and anti-icing operations are conducted at Pearson International Airport and at other major airports in Canada.</p> <p>MCR 10</p> <p>Transport Canada should, on a priority basis, provide, where necessary, enforcement resources to ensure that the <i>clean aircraft</i> regulation is complied with, including runway-end spot checks of aircraft surfaces in adverse winter weather.</p>	<p>MCR 8</p> <p>Transport Canada strongly encouraged the use of type II anti-icing fluids in a letter to all Canadian air carriers dated March 9, 1991. This is also the subject of ongoing discussions with air carriers.</p> <p><b>Status: Implemented.</b></p> <p>MCR 9</p> <p>It is proposed that the current requirements of <i>Air Regulation 540.2</i> provide a satisfactory response to this recommendation with regard to reliable inspection of aircraft surfaces. It is further proposed that this report be forwarded to Labour Canada for information.</p> <p><b>Status: Implemented.</b></p> <p>MCR 10</p> <p>Guidelines were issued to all Transport Canada Regional Directors General, Aviation and the Chief, Air Carrier Operations on August 23, 1991. These guidelines include detailed procedures for national monitoring applicable to all classes of operations (private, corporate, state and commercial) to ensure compliance with the new clean wing regulation; training and knowledge requirements pertaining to aircraft critical surface contamination; and an information/feedback reporting system.</p>

### Part III: Implementation Measures

Recommendations	Implementation Measures
<p>MCR 11</p> <p>Transport Canada should strongly encourage Canadian air carriers to form joint entities to provide all air carrier de-icing/anti-icing services at Pearson International Airport and at other major airports in Canada, and to have available, for use when necessary, equipment capable of applying both type I and type II fluids.</p> <p>MCR 12</p> <p>Transport Canada should require that air carriers produce aircraft ground de-icing/anti-icing procedures and training standards for both flight and ground personnel. Implementation of such procedures and standards should be made a mandatory requirement of an air carrier's operating certificate.</p>	<p>Further amendments and improvements have been accomplished in the areas of air operations under icing conditions (see Part II - Aircraft Contamination).</p> <p><b>Status: Implemented.</b></p> <p>For MCR 11 See MCR 15</p> <p>MCR 12</p> <p>In compliance with the amended <i>Air Regulations</i>, promulgated on November 21, 1990, and Air Navigation Orders, air carriers are required to have approved training programs for both flight and ground personnel. Training programs are required to be incorporated into the Company Operations Manual. As well, the Company Operations Manual is required to include the de-icing/anti-icing procedures applicable to the company's operations. The Company Operations Manual is a mandatory requirement to obtaining an Operating Certificate.</p> <p>Further amendments and improvements have been accomplished in the</p>

### Part III: Implementation Measures

Recommendations	Implementation Measures
<p>MCR 13</p> <p>Transport Canada's Airports Authority Group should place on the staff of each of its major airports, individuals with substantial flight operations expertise. Such individuals should report directly to the airport manager on any issue related to operational safety. Furthermore, a mandatory reporting process should be put in place to ensure that aviation safety-related issues are promptly brought to the attention of the appropriate decision-making level of senior management and to ensure that such issues are addressed within a specified period of time.</p> <p>MCR 14</p> <p>Transport Canada should examine, on a priority basis, Canadian airports served by air carriers to ascertain if the incompatibility between departure delays and de-icing/anti-icing fluid hold-over times, as identified at Toronto's Pearson International Airport, exists at other sites. Should such incompatibilities be found, Transport Canada should ensure that appropriate corrective measures are taken.</p>	<p>areas of air operations under icing conditions (see Part II - Aircraft Contamination).</p> <p><b>Status: Implemented.</b></p> <p>MCR 13</p> <p>Based on the analysis and in particular, in view of the changes made at Canada's two major airports, LBPIA and Vancouver, which comply with the requirements of MCR 13, this recommendation was initially considered fully implemented. However, the Executive Steering Committee directed that Montreal Airport be assessed against the requirements of MCR 13 as well.</p> <p><b>Status: Under Way.</b></p> <p>For MCR 14 See MCR 15</p>

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Recommendations	Implementation Measures
<p>MCR 15</p> <p>Transport Canada and/or the air carriers should, in the interests of ramp employee safety and for environmental reasons, maintain suitable equipment and develop appropriate procedures for the clean-up and disposal of de-icing/anti-icing fluids in areas utilized by air carriers.</p>	<p>MCRs 5, 11, 14, 15</p> <ul style="list-style-type: none"> <li>Principal facility, Option A, the modified Status Quo, be adopted, which involves the construction of fluid collection, storage, and disposal systems south of Terminals 1 and 2 at a total estimated capital cost of \$6.3 million. (MCR 5)</li> <li>Satellite facility, Option A, to be situated on the outside of Taxiway Delta at the entrance to Taxiway Echo, (presented as Option 1 in section 2.8 of the Task Group report) be adopted, which involves the construction of a de-icing/anti-icing pad to serve the most frequently used runways, 24L and 06R, at a total estimate capital cost of \$7.3 million. (MCR 5)</li> </ul> <p><b>Status: Under Way.</b> A satellite facility close to the button of Rwy 33L is planned. (MCR 5)</p> <p><b>Status: Implemented.</b> Industry involvement in the Standing Committee on Operations Under Icing Conditions ensures the spirit of cooperation and exchange of information nationally. (MCR 11)</p> <p><b>Status: Implemented.</b> Current exchange of information on fluid performance together with regulatory provisions for carriers to submit winter operations program addresses MCR 14. (MCR 14)</p> <p><b>Status: Implemented.</b> The design and construction of de-icing/anti-icing facilities will continue to conform with employee and environment standards. (MCR 15)</p>

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Recommendations	Implementation Measures
<p>MCR 16</p> <p>Transport Canada should take an active and participatory role in the work currently underway within the international aviation community to advance aircraft ground de-icing/anti-icing technology. This should include involvement in the development of international standards, development of guidance material for remote and runway-end de-icing facilities, and development of more reliable methods of predicting de-icing/anti-icing fluid hold-over times.</p>	<p>MCR 16</p> <p>Further to the advances in aircraft ground de-icing/anti-icing technology accomplished by the DCIP within the international aviation community, research and development initiatives continue in the areas of:</p> <ul style="list-style-type: none"> <li>- weather forecasting</li> <li>- de-icing/anti-icing fluids</li> <li>- aircraft and performance under icing conditions</li> <li>- de-icing/anti-icing operations</li> </ul> <p>as recommended by the Standing Committee on Operations Under Icing Conditions.</p> <p>In addition to the extensive research conducted to-date, ongoing activity will be prioritized by the Standing Committee on Operations Under Icing Conditions.</p> <p><b>Status: Implemented.</b></p>
<p>MCR 17</p> <p>Transport Canada should strongly encourage Canadian air carriers to provide their flight crews with de-icing/anti-icing fluid hold-over time charts that are based on the most recent technological information. These charts should be used as guidelines.</p>	<p>MCR 17</p> <p>Transport Canada's letter in early March 1991, to all Canadian air carriers, asked carriers to immediately contact their supplier of de-icing/anti-icing fluid to request the latest information on hold-over times and make this current information available to all flight crews.</p> <p>Transport Canada has also issued an Air Carrier Advisory Circular each fall (1990 onwards) just prior to the winter season, which contains the</p>

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Recommendations	Implementation Measures
<p>MCR 18</p> <p>Transport Canada ensure that airport crash, fire-fighting, and rescue units carry out emergency response exercises as mandated in applicable Transport Canada documentation, including exercises in winter and in off-airport conditions.</p> <p>MCR 19</p> <p>Transport Canada ensure that all persons involved in crash, fire-fighting, and rescue (CFR) exercises, including CFR chiefs and on-site coordinators, fully understand and carry out their duties during such exercises, as defined in applicable Transport Canada documentation and as they would in an emergency.</p>	<p>latest SAE guidelines for hold-over times for types I and II fluid mixtures.</p> <p><b>Status: Implemented.</b></p> <p>For MCR 18 See MCR 31</p> <p>MCR 19</p> <p>This is currently in place at Transport Canada operated and subsidized airports. Emergency response services personnel receive a rigorous, on-going training program which fully familiarizes them with their duties in both exercises and a real emergency. Furthermore, all Transport Canada owned, operated and subsidized airports are required to have a Disaster/Emergency Plan which specifies the duties of firefighters and on-scene controllers responding to an aircraft incident on or off the airport.</p> <p><b>Status: Implemented.</b></p>

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Recommendations	Implementation Measures
<p>MCR 20</p> <p>Transport Canada ensure that airports subsidized by Transport Canada have in place at all times up-to-date crash, fire-fighting, and rescue airport emergency response plans and airport emergency procedures manuals approved by Transport Canada.</p>	<p>MCR 20</p> <ul style="list-style-type: none"> <li>• Responsibility for the approval of emergency response plans reside in one organizational unit within Transport Canada.</li> <li>• Standards and guidelines for the preparation and testing of emergency response plans at all Canadian airports be developed, based on those already in use by the Airports Group, and incorporated into the Aerodromes and Airports Standards that will amplify Part III of the Canadian Aviation Regulations.</li> <li>• The Aerodromes and Airports Standards that will accompany Part III of the Canadian Aviation Regulations state that emergency response plans and their related manuals must be approved by Transport Canada in a timely manner.</li> </ul> <p><b>Status: Implemented.</b></p>
<p>MCR 21</p> <p>Transport Canada ensure that the necessary crash, fire-fighting, and rescue emergency response to aircraft crashes that occur within the critical rescue and fire-fighting access area (CRFAA) be clearly delineated in all relevant documentation, including airport emergency response plans and airport emergency procedures manuals.</p>	<p>For MCR 21 See MCR 27</p>



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Recommendations	Implementation Measures
<p>documents specifically define the responsibilities of a crash, fire-fighting, and rescue unit within the CRFAA both within the airport boundaries and/or beyond.</p> <p>MCR 25</p> <p>Transport Canada ensure, through the fire-fighter certification program, and other programs and agreements as necessary, that all crash, fire-fighting, and rescue fire-fighters, including the fire chiefs, are adequately trained.</p> <p>MCR 26</p> <p>Transport Canada proffer for enactment legislation that empowers Transport Canada to ensure that all crash, fire-fighting, and rescue (CFR) personnel, including those at non-Transport Canada-owned and non-Transport Canada-operated airports, meet Transport Canada CFR training and operating standards.</p> <p>MCR 27</p> <p>Transport Canada encourage all communities where there is an airport with fire-fighting services to include in their mutual aid/emergency response plans specific instructions regarding the duties, responsibilities, and area of authority of each organization that is expected to respond to an aircraft emergency on and/or off airport property.</p>	<p>For MCR 25 See MCR 26</p> <p>MCRs 25, 26</p> <p>Transport Canada regulate the provision of emergency response services and this regulation be developed in the CARAC process.</p> <p><b>Status: Under Way. (MCRs 25, 26)</b></p> <p>MCRs 21, 23, 24, 27</p> <ul style="list-style-type: none"> <li>• In the appropriate place and manner, Part III of the Canadian Aviation Regulations and its attendant standards and guidelines incorporate the following requirements governing the emergency response plans of all airports:</li> <li>• That the concept and principles of the Critical Rescue and Fire-fighting Access Area (CFAA) be applied in emergency response</li> </ul>

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Recommendations	Implementation Measures
	<p>plans and that the CFAA be defined as:</p> <ul style="list-style-type: none"> <li>- a rectangular area, centred on a runway, 300 metres wide and extending 1000 metres past the runway at each end. It is not necessarily coincident with the airport's boundary, and the accessibility of its terrain is not taken into account when defining its limits. Historically, the majority of aircraft accidents has taken place within the CFAA;</li> <li>- that appropriate emergency response plans must be made to deal with emergencies on all parts of the CFAA;</li> <li>- that all airports clearly define in the relevant documentation the limits of the area covered by their emergency response plans and describe the emergency response measures to be provided in the event of an emergency both within and outside the CFAA;</li> <li>- that airports describe in their mutual aid agreements with responding agencies the roles, responsibilities, and areas of authority of each participant both within the CFAA and beyond;</li> <li>- that the airport manager obtain the participation of local emergency response agencies early and often in the development and amendment of the airport's emergency response plan.</li> </ul> <ul style="list-style-type: none"> <li>• All related Transport Canada manuals and documents be amended to include the above requirements.</li> <li>• The "Transport Canada Crash, Fire-fighting, and Rescue Services Standards" (TP 3660) be amended to clarify subsections 3.01, 3.02,</li> </ul>

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Recommendations	Implementation Measures
<p>MCR 28</p> <p>Transport Canada ensure that refuellers at Transport Canada-subsidized or operated airports are fully knowledgeable in and follow safe refuelling practices.</p> <p>MCR 29</p> <p>Transport Canada implement a policy of having airport crash, fire-fighting, and rescue units, after appropriate training, responsible for monitoring aircraft fuelling procedures and ensuring compliance with fuelling standards and procedures.</p>	<p>and 3.03.</p> <ul style="list-style-type: none"> <li>CFR training be amended to include the concept and principles of the CFAA.</li> <li>The Disaster/Emergency Planning Course be amended to provide instruction on the concept and principles of the CFAA and to encourage local communities to describe in their own emergency response plans the duties, responsibilities, and areas of authority of each organization designated to respond to an airport emergency both within the CFAA and beyond.</li> </ul> <p>Status: Under Way. (MCRs 21, 23, 24, 27)</p> <p>For MCR 28 See MCR 79</p> <p>For MCR 29 See MCR 79</p>

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Recommendations	Implementation Measures
<p>MCR 30</p> <p>Transport Canada ensure that training programs for airport crash, fire-fighting, and rescue units include preparing fire-fighters for the realities of an air crash, so that they are not distracted from their primary responsibilities at a crash site.</p> <p>MCR 31</p> <p>That whenever a crash, fire-fighting, and rescue (CFR) unit responds to an aircraft crash, Transport Canada, as part of its post-crash response, objectively review and analyse the actions of the CFR unit forthwith, in order that deficiencies in the CFR response can be corrected and useful information, on both the positive and negative aspects of the response, may be passed on to other CFR units.</p>	<p>For MCR 30 See MCR 31</p> <p>MCRs 18, 30, 31</p> <ul style="list-style-type: none"> <li>• In the appropriate place and manner, Part III of the Canadian Aviation Regulations and its attendant standards and guidelines incorporate the following requirements governing crash, fire-fighting, and rescue services: <ul style="list-style-type: none"> <li>- that full-scale emergency response exercises be conducted every three years;</li> <li>- that all participants in an emergency response exercise must function in the capacity and carry out the duties and responsibilities that would normally be assigned to that person in an emergency;</li> <li>- that an objective post-accident review of a CFR unit's emergency response to an aircraft accident be conducted by the appropriate Emergency Planning Officer;</li> <li>- that the results of post-accident reviews and post-exercise debriefing sessions be presented in the recurrent training for all</li> </ul> </li> </ul>

### Part III: Implementation Measures

Recommendations	Implementation Measures
	<p>CFR personnel for that year and that, where useful, the lessons learned be summarized and made a part of the recurrent training for subsequent years;</p> <ul style="list-style-type: none"> <li>• A guideline be developed for the conduct of post-accident reviews and post-exercise debriefing sessions. As a minimum, this guideline would stipulate that, in order to avoid any possible conflict of interest on the part of the evaluator, the post-accident review be conducted by a representative from headquarters or from a region other than the one to which the airport is assigned. It would also state that the purpose of both the post-accident review and the post-exercise debriefing session is to identify the strengths and weaknesses of an airport's emergency response plan and to disseminate information to other CFR units across the country on the effectiveness of new and traditional approaches to CFR operations;</li> <li>• All related Transport Canada manuals and documents be amended to reflect the above requirements;</li> <li>• The reality training phase of the Firefighters Certification Program be revised to include reference to the events at Dryden and the fact that fire-fighters became distracted from their primary duties of creating a fire-free path by helping survivors;</li> <li>• Instruction be given to Emergency Planning Officers in the conduct of post-accident reviews and the use of the guideline.</li> </ul> <p><b>Status: Under Way. (MCRs 18, 30, 31)</b></p>

## Part III: Implementation Measures

Recommendations	Implementation Measures
<p>MCR 32</p> <p>Transport Canada ensure that local arrangements be made between airport managers and air carriers that will result in crash, fire-fighting, and rescue personnel being informed of the number of persons on board, fuel on board, and any hazardous cargo on board an aircraft in the shortest possible time following an incident or accident. These procedures should accommodate the possibility that the aircraft flight crew will not be able to provide this information.</p>	<p>MCR 32</p> <ul style="list-style-type: none"> <li>• The "Airports Emergency Planning Manual" (TP 1801), be amended to include, as one of the air carrier's responsibilities, the provision of information on the amount of fuel on board an aircraft involved in an accident or incident;</li> <li>• The Aerodromes and Airports Standards that will amplify Part III of the Canadian Aviation Regulations include the requirement for air carriers to create procedures for the provision of the following critical information in the shortest possible time following an incident or accident: <ul style="list-style-type: none"> <li>- the number of passengers and crew</li> <li>- the amount of fuel</li> <li>- the identification, quality, and location of any dangerous goods on board the aircraft;</li> </ul> </li> </ul> <p>These procedures should be described as part of the local arrangements made in airport Emergency Response Plans;</p> <ul style="list-style-type: none"> <li>• No airport be issued an Operating Certificate or amendment thereto unless the airport's Emergency Response Plan contains satisfactory procedures for the provision of the above-listed critical information to crash, fire-fighting, and rescue personnel in the shortest possible time following an incident or accident.</li> </ul> <p><b>Status: Under Way.</b></p>

## Part III: Implementation Measures

Recommendations	Implementation Measures
<p>MCR 33</p> <p>Transport Canada, in cooperation with airport operators, ensure that all Canadian airports not owned or operated by Transport Canada, which service a scheduled air carrier operation, have appropriate crash charts made available to the same degree and extent as at airports owned and operated by Transport Canada.</p>	<p>MCR 33</p> <p>Transport Canada prepare and distribute aircraft crash charts to all airports that handle scheduled commercial passenger traffic. Crash charts would be made available, on request, to all other Canadian airports. In implementing the above option, Transport Canada will:</p> <ul style="list-style-type: none"> <li>• Maintain its current distribution to airports;</li> <li>• Expand distribution to include all airports serving commercial passenger traffic and, where emergency rescue services exist, charter operations;</li> <li>• Inform all airport operators, including those that do not handle commercial passenger traffic, of the availability of aircraft crash charts and their revisions as they are made; and</li> <li>• Incorporate instruction in the use of crash charts into Transport Canada's fire-fighter training and certification requirements.</li> </ul> <p><b>Status: Implemented.</b></p>
<p>MCR 34</p> <p>Transport Canada and the Transportation Safety Board of Canada, through national and international initiatives and committees, continue to press for the adoption of more rigorous survivability test requirements for aircraft flight data-recording systems.</p>	<p>For MCR 34 See MCR 36</p>

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Recommendations	Implementation Measures
<p>MCR 35</p> <p>Transport Canada and the Transportation Safety Board of Canada undertake a research program leading to the development of the most suitable deployable or non-deployable aircraft flight data-recording systems that can reasonably be expected to survive any crash and yield usable data.</p> <p>MCR 36</p> <p>Transport Canada and the Transportation Safety Board of Canada study, or cause to be studied, the location of aircraft flight data-recording systems in aircraft, with a view to assuring the survival of the recording systems in any crash.</p>	<p>For MCR 35 See MCR 36</p> <p>MCRs 34, 35, 36</p> <p>In view of the fact that the United States has already adopted the more rigorous standards for the survivability of flight data-recording systems proposed by the European Organization for Civil Aviation Equipment, that other countries will likely follow the U.S. example in the near future, and that Transport Canada and the Transportation Safety Board are actively involved in several international organizations whose goal is to improve the survivability of flight data-recording systems, the requirements of MCR 34 be considered fulfilled;</p> <p>Once completed, the planned research to determine the optimal location for flight data-recording systems be considered a full and satisfactory response to the requirements of MCR 36;</p> <p>A research proposal to evaluate the feasibility of downloading flight data and of comparing this technology with currently available deployable and non-deployable systems be made to the Standing Committee on Operations under Icing Conditions, established in response to MCR 83, for its consideration. This Committee, whose purpose is to monitor the effectiveness of the regulations governing operations under icing conditions and to disseminate information on aircraft surface</p>

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Recommendations	Implementation Measures
<p>MCR 37</p> <p>Transport Canada make mandatory the issuance of a letter of approval to an air carrier as an integral part of the approval process of the "maintenance control manual" or any amendment thereto.</p>	<p>contamination and ground icing operations in Canada, has a broad scope that includes identifying research priorities and making R &amp; D funding recommendations;</p> <p>The on-going work of the Transportation Safety Board on aircraft flight data-recording systems, together with the initiation of the above planned research into the downloading of data, be considered a satisfactory response to MCR 35.</p> <p><b>Status: Implemented. Ongoing activity will be prioritized by the Standing Committee on Operations Under Icing Conditions. (MCRs 34, 35, 36)</b></p> <p>MCR 37</p> <p>Amendments made to the Airworthiness Manual, which outline procedures for seeking and obtaining formal approval of Maintenance Control Manuals, and Approved Maintenance Organizations, address the problem identified by the Commission. Therefore this recommendation is considered implemented with the stipulation that Transport Canada is responsible for ensuring that the procedures outlined in the Airworthiness Manual are followed on a continuing and timely basis.</p> <p><b>Status: Implemented.</b></p>

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Recommendations	Implementation Measures
<p>MCR 38</p> <p>Transport Canada redefine in Air Navigation Order Series II, No. 20, the term "essential equipment," in order that it be unambiguous and easily understood by pilots and technicians who have to use or refer to the term.</p>	<p>MCR 38</p> <p>The Canadian Aviation Regulations being drawn up to replace the existing <i>Air Regulations</i> and Air Navigation Orders incorporate, in the appropriate place and manner, the shaded areas of the draft Order developed by the DCIP. This draft Order addresses the intent of MCR 38.</p> <p><b>Status: Implemented.</b></p>
<p>MCR 39</p> <p>Transport Canada press for the adoption of standards for aircraft interiors that would prevent the rapid spread of fire and the emission of toxic fumes.</p>	<p>MCR 39</p> <ul style="list-style-type: none"> <li>for commercial aeroplanes operated by Canadian air carriers (i.e. in compliance with the <i>Air Carriers Using Large Aeroplanes Order (ANO VII, No. 2)</i>) with a passenger capacity of 20 or more, type approved or type certificated <u>after</u> January 1, 1958, legislation commensurate with the proposed <i>Improved Flammability Standards for Compartment Interior Materials Order (ANO II, No. 32)</i> to implement the present flammability standards for compartment interior materials of paragraph 525.853(c) of Chapter 525 - Airworthiness Standards: Transport Category Aeroplanes (presently in effect for the type approval of new type designs) on such aeroplanes when they are newly-manufactured on or after a specified date such as 1 year after date of promulgation, and on such existing aeroplanes when they undergo a substantially complete replacement of the affected interior components on or after a specified date such as 1 year after date of promulgation; and</li> </ul>

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Recommendations	Implementation Measures
<p>MCR 40</p> <p>Transport Canada ensure that all operations personnel involved in air carrier operations, including managers, operations officers, maintenance personnel, and pilots, be made fully aware of the nature and the danger of wing contamination on both jet- and propeller-driven aircraft.</p>	<ul style="list-style-type: none"> <li>◦ for commercial aeroplanes operated by Canadian air carriers (in compliance with ANO VII, No. 2) with a passenger capacity of 20 or more, type approved or type certificated before January 1, 1958, legislation to implement the flammability standards for compartment interior materials of section 25.853 of 'FAR 25 - Airworthiness Standards: Transport Category Aeroplanes' in effect on 30 April 1972, on such existing aeroplanes when they undergo a substantially complete replacement of the affected interior components on or after a specified date such as 1 year after date of promulgation; and</li> <li>◦ when the Canadian Aviation Regulations are developed, the above requirements and those of the Order Respecting Flammability Requirements for Aeroplane Seat Cushions (ANO II, No. 28) be integrated in the appropriate place and manner; and</li> <li>◦ an industry/government working group, under the appropriate CARAC Technical Committee, establish a uniform application of the term "substantially complete".</li> </ul> <p><b>Status: Under Way.</b></p> <p>MCR 40</p> <p>A regulation now requires all personnel involved in air carrier operations to partake in a safety awareness program with respect to contamination on both jet and propeller driven aircraft. The regulation was implemented as a result of the interim recommendations of the Commission.</p> <p><b>Status: Implemented.</b></p>

## Part III: Implementation Measures

Recommendations	Implementation Measures
<p>MCR 41</p> <p>Transport Canada ensure that all personnel involved in air carrier operations, including managers, operations officers, maintenance personnel, and pilots, have, and be able to demonstrate, a thorough understanding of all aspects of wing contamination, including its formation, removal, and prevention, and its effects on the aerodynamics of aircraft, with particular emphasis on the insidious nature of the "cold-soaking" phenomenon.</p> <p>MCR 42</p> <p>Pilots be informed in writing by Transport Canada how the application of non-standard handling techniques, as described in the "Flight Dynamics" report prepared for this Commission and included in the Final Report as technical appendix 4; as described in the Fokker F-28 Flight Handbook; and as described in testimony by expert witnesses, may assist a pilot to deal with an abnormal or emergency situation discovered during takeoff. It is stressed that this Commission does not advocate the use of non-standard handling techniques to operate aircraft in adverse weather conditions as an alternative to the proper preparation of the aircraft for flight.</p>	<p>MCR 41</p> <p>The current Transport Canada regulation requiring air carriers to provide an approved training program to all air carrier operational personnel emphasizes the cold soaking phenomenon. Air carriers must verify the knowledge of these employees through testing. The regulation was implemented as a result of the interim recommendations of the Commission.</p> <p><b>Status: Implemented.</b></p> <p>MCR 42</p> <p>Transport Canada continue to:</p> <ul style="list-style-type: none"> <li>• Require that existing air carrier training programs include an annual review for flight crew of the effect of snow and ice on the performance of aircraft;</li> <li>• Monitor the response of the United States Federal Aviation Administration to the recommendations made by the National Transportation Safety Board to conduct further research into flight with contaminated critical surfaces; and,</li> <li>• Work closely with the FAA on joint Canada/U.S. research initiatives.</li> </ul> <p><b>Status: Implemented.</b></p>

### Part III: Implementation Measures

Recommendations	Implementation Measures
<p>MCR 43</p> <p>Transport Canada require that aircraft flight manuals and related aircraft operating manuals contain approved guidance material for supplementary operating procedures, including performance information for operating on wet and contaminated runways.</p> <p>MCR 44</p> <p>Transport Canada, in cooperation with aircraft manufacturers and operators, expedite the search for a technically accurate means of defining runway surface conditions and their effects on aircraft performance.</p> <p>MCR 45</p> <p>Transport Canada require air carriers to provide adequate training to flight crews with respect to the effects of contaminated runways on the performance of aircraft in the context of landings, takeoffs, and rejected takeoffs.</p>	<p>For MCR 43 See MCR 46</p> <p>For MCR 44 See MCR 46</p> <p>For MCR 45 See MCR 46</p>

### Part III: Implementation Measures

Recommendations	Implementation Measures
<p>MCR 46</p> <p>Transport Canada, in cooperation with aircraft manufacturers and operators, expedite the search for an equitable and practical means of requiring operators to adhere to balanced field criteria when operating on wet or contaminated runways.</p>	<p>MCRs 43, 44, 45, 46</p> <ul style="list-style-type: none"> <li>• Transport Canada Aviation participate actively with manufacturers, operators and other civil aviation authorities in the international fora, particularly with respect to the regulatory requirements in the United States, with a view to achieving harmonization of international standards. This will allow for an equitable and practical means of requiring operators to adhere to balanced field criteria when operating on wet or contaminated runways and for determining accurate means on runway surface conditions and their effects on aircraft performance (MCRs 44 &amp; 46).</li> <li>• In the interim, the Canadian Aviation Regulations, covering airline operations, be amended to require, for turbo-jet aircraft, that: <ul style="list-style-type: none"> <li>- operations manuals contain performance information for operating on wet and contaminated runways (MCR 43); and</li> <li>- training be given to flight crews with respect to the effects of contaminated runways on the performance of aircraft (MCR 45).</li> </ul> </li> <li>• Transport Canada Aviation form a government industry working group, under the CARAC Commercial Air Services Operations (CASO) Technical Committee to develop the associated standards.</li> <li>• Transport Canada Aviation's Standing Committee on Operations Under Icing Conditions carefully review the R &amp; D plan regarding operations on wet and contaminated runways in order to identify research priorities and make funding recommendations to the Aviation Regulation Management Council (MCR 44).</li> </ul>

### Part III: Implementation Measures

Recommendations	Implementation Measures
<p>MCR 47</p> <p>Transport Canada, in cooperation with airport operators, expedite the search for more efficient methods of ensuring that runways are maintained free of contaminants that affect the takeoff performance of aircraft.</p> <p>MCR 48</p> <p>Transport Canada participate in and encourage research concerning devices that can allow pilots to assess the external state of the aircraft from within the flight deck. In addition to assisting pilots in assessing possible contamination of the aircraft, such devices would assist pilots in assessing any mechanical or technical problems on the exterior of the aircraft.</p>	<ul style="list-style-type: none"> <li>Prior to full implementation of the above, Air Carrier Advisory Circulars be used to communicate significant information contained in the Sypher:Meuller report.</li> </ul> <p><b>Status: Implemented. Ongoing activity will be prioritized by the Standing Committee on Operations Under Icing Conditions. (MCR 44)</b></p> <p><b>Status: Under Way. (MCRs 43, 45, 46)</b></p> <p>MCR 47</p> <p>Transport Canada's runway maintenance program is of a very high standard and it will continue its excellent runway maintenance program, as well as its keen search for enhancements in all aspects of maintaining runways in a safe condition, and as contamination free as practicable.</p> <p><b>Status: Implemented.</b></p> <p>MCR 48</p> <p>With the survey of all ice and other contamination sensors, the development support provided by the DCIP, and the devices that are ready for market or already available, the requirements of this recommendation have been fulfilled.</p> <p>It is also proposed that any future requests for research and development funds related to contamination detection systems or lift loss sensors be referred to the Standing Committee on Operations under Icing Conditions</p>

### Part III: Implementation Measures

Recommendations	Implementation Measures
<p>MCR 49</p> <p>Transport Canada proffer for enactment legislation which would require that approved minimum equipment lists be in place for all aircraft certified under United States Federal Aviation Regulation 25, predecessor regulations, or equivalent legislation, prior to the use of such aircraft in commercial service in Canada.</p> <p>MCR 50</p> <p>Transport Canada not issue an operating certificate or amendment to an operating certificate to an air carrier operating aircraft certified under United States Federal Aviation Regulation 25, predecessor regulations, or equivalent legislation until required and approved minimum equipment lists are in place.</p>	<p>for its consideration. This Committee, whose purpose is to monitor the effectiveness of the regulations governing operations under icing conditions and to disseminate information on aircraft surface contamination and ground icing operations in Canada, has a broad scope that includes identifying research priorities and making R &amp; D funding recommendations.</p> <p><b>Status: Implemented. Ongoing activity will be prioritized by the Standing Committee on Operations under Icing Conditions.</b></p> <p>For MCR 49 See MCR 50</p> <p>MCRs 49, 50</p> <ul style="list-style-type: none"> <li>• The Canadian Aviation Regulations, Part VII covering Airline and Commuter operations require that, where a MEL for the aircraft type exists, no aircraft be operated without an approved MEL.</li> <li>• In order to effectively implement MCRs 49 and 50, the MEL approval process must be reviewed so that approvals are made in a timely fashion. Generic MELs will be implemented at the same time as the proposed legislation takes effect.</li> </ul> <p><b>Status: Implemented. (MCRs 49, 50)</b></p>

### Part III: Implementation Measures

Recommendations	Implementation Measures
<p>MCR 51</p> <p>Transport Canada ensure that the repair of an unserviceable aircraft auxiliary power unit be deferred only with an operational restriction requiring approved engine ground-start facilities to be available at all airports into which that commercial aircraft is expected to operate. This operational restriction should be included in the aircraft minimum equipment list.</p>	<p>MCR 51</p> <ul style="list-style-type: none"> <li>• The Commercial Air Services Standards require that the Operations Manuals of all air carriers prohibit aircraft with unserviceable auxiliary power units from being dispatched to or landing at airports where ground-start facilities are not available: <ul style="list-style-type: none"> <li>- when the aircraft has no internal engine-start capability and</li> <li>- when refuelling may be necessary and the aircraft is prohibited from being refuelled with an engine running; or,</li> <li>- when de-icing may be necessary and the aircraft is prohibited from being de-iced with an engine running;</li> </ul> </li> <li>• The foregoing requirement be cross-referenced with the appropriate section of the aircraft's Minimum Equipment List;</li> <li>• Air carrier training programs, in particular training programs for pilots, dispatchers, and maintenance personnel, be amended to include this operational restriction;</li> <li>• The Manual of Regulatory Audits (TP 8606) be amended to include, as items for audit, this operational restriction and the related training programs of air carriers.</li> </ul> <p><b>Status: Implemented.</b></p>

### Part III: Implementation Measures

Recommendations	Implementation Measures
<p>MCR 52</p> <p>Transport Canada issue all pilots a warning pointing out the dangers inherent in pulling circuit-breakers on board an aircraft in order to silence an alarm that may in fact be giving a valid warning.</p> <p>MCR 53</p> <p>Transport Canada require that Air Carriers have in place appropriate policies and directives to ensure that flight crews, at the time they receive an operational flight plan, are informed of any aircraft defects that have been deferred to a minimum equipment list.</p>	<p>MCR 52</p> <p>It was determined that an Air Carrier Advisory Circular be issued (concerning the dangers of pulling circuit breakers) and further that the information also be included in the Airmanship Section of the Aeronautical Information Publication (AIP).</p> <p><b>Status: Implemented.</b></p> <p>MCR 53</p> <p>Transport Canada amend its policies to ensure that air carriers include in their Maintenance Control Manual and Operations Manual a requirement for maintenance personnel to advise the Flight Dispatch (if applicable), as soon as possible, of any aircraft defects that have been deferred, as permitted by a MEL approved for that aircraft, in order that flight crew be advised.</p> <p>This policy change must be incorporated into a company's Maintenance Control Manual and Operations Manual prior to Transport Canada approval.</p> <p>This requirement must also be incorporated into the Manual of Regulatory Audits, TP8606, and would be subject to audit.</p> <p><b>Status: Implemented.</b></p>

### Part III: Implementation Measures

Recommendations	Implementation Measures
<p>MCR 54</p> <p>Transport Canada require all Air Carriers that operate aircraft having minimum equipment lists (MELs) to provide approved training to all pilots, maintenance personnel, and dispatchers on the proper use of an MEL.</p>	<p>MCR 54</p> <ul style="list-style-type: none"> <li>• The Master Minimum Equipment List/Minimum Equipment List Policy and Procedures Manual (TP9155) be amended to include the statement: "no aircraft shall be operated where, in the opinion of the pilot-in-command, flight safety is or may be compromised";</li> <li>• Transport Canada require that training on the purpose and use of a Minimum Equipment List be extended to dispatchers, flight operations officers, and other key ground personnel involved in the operational control of flights and that the MMEL/MEL Policy and Procedures Manual be amended accordingly;</li> <li>• All Minimum Equipment List training programs meet the requirements of and be approved in accordance with Chapter 3, Sections 3.6.1, 3.6.2, and 3.6.3, of Transport Canada's MMEL/MEL Policy and Procedures Manual (TP9155), as amended above;</li> <li>• Transport Canada amend the Manual of Regulatory Audits (TP8606) to require the audit of all MEL training programs in accordance with the above changes;</li> <li>• Minimum Equipment Lists for specific aircraft be reviewed to ensure that the "Remarks" column specifies restrictions and conditions that must be met prior to dispatch of the aircraft.</li> </ul> <p><b>Status: Implemented.</b></p>

### Part III: Implementation Measures

Recommendations	Implementation Measures
<p><b>MCR 55</b></p> <p>Transport Canada ensure that Air Carriers have operational policies that require the availability of appropriate ground-support facilities at individual airports where the air carrier intends to operate.</p>	<p>For MCR 55 See MCR 57</p>
<p><b>MCR 56</b></p> <p>Transport Canada ensure that the operational policies referred to in Recommendation MCR 55 above be contained in the air carrier's operations manuals, such as its flight operations manual and its route manual, and/or the individual aircraft minimum equipment list.</p>	<p>For MCR 56 See MCR 57</p>
<p><b>MCR 57</b></p> <p>Transport Canada ensure that, when it is reviewing an air carrier application for an operating certificate or an amendment to an operating certificate, there be a scrutiny of the air carrier's intended aircraft support facilities. Transport Canada then should satisfy itself that operational policies contained in the air carrier's operations manuals adequately accommodate the air carrier's identified and existing aircraft support facilities. No operating certificate or amendment to an operating certificate should be issued unless Transport Canada is so satisfied.</p>	<p>MCRs 55, 56, 57</p> <p>The changes in the rules and standards being introduced in the CARs along with the specific improvements resulting from implementation of other Commission recommendations fully address the concerns expressed in MCRs 55 and 56. It is therefore proposed that these recommendations be considered completed.</p> <p><b>Status: Implemented. (MCRs 55, 56, 57)</b></p>

### Part III: Implementation Measures

Recommendations	Implementation Measures
<p>MCR 58</p> <p>Transport Canada direct its airworthiness personnel to determine themselves whether an air carrier has adequate spare parts for the proper maintenance of aircraft. Under no circumstances should this decision, in effect, be delegated to any person employed by the applicant air carrier.</p> <p>MCR 59</p> <p>Transport Canada proffer for enactment an amendment to Air Navigation Order Series VII, No. 2, Part II, section 12(2), that assists Transport Canada airworthiness personnel to determine whether sufficient spare parts exist. Alternatively, an approved written departmental policy should be promulgated to assist airworthiness personnel to make this determination.</p> <p>MCR 60</p> <p>Transport Canada under no circumstances issue an operating certificate or an amendment to an operating certificate until it is satisfied that all spare parts requirements established by Transport Canada are fulfilled.</p>	<p>For MCR 58 See MCR 60</p> <p>For MCR 59 See MCR 60</p> <p>MCRs 58, 59, 60</p> <ul style="list-style-type: none"> <li>• The Commercial Air Services Standards supporting the new Canadian Aviation Regulations require air carriers, as part of quality assurance reviews, to evaluate the efficacy of their spare parts supply system by analysing problems in its aircraft defect reporting and controlling system in order to ensure that they are not caused by a shortage of spare parts;</li> <li>• The Commercial Air Services Standards require air carrier Maintenance Control Manuals to include the following four elements:</li> </ul>

### Part III: Implementation Measures

Recommendations	Implementation Measures
	<ol style="list-style-type: none"> <li>1. A statement of the air carrier's policy on spare parts;</li> <li>2. A statement that the quality assurance manager, or other official designated by the air carrier, and senior company executives are responsible to ensure that aircraft defect reporting and control problems are not caused by a shortage of spare parts;</li> <li>3. Designation of the official responsible for the analysis of defect reporting and control systems to determine the nature of problems, and a commitment from senior company executives that they will take corrective action when such an analysis demonstrates the corrective action to be taken is the acquisition of additional spare parts;</li> <li>4. Company Maintenance Control Manuals must reflect the need for the Quality Assurance program to ensure that spare parts shortages are not the root cause of a defect control problem.</li> </ol> <ul style="list-style-type: none"> <li>• The "Manual of Regulatory Audits" checklists be amended to ensure Company Quality Assurance Review address spare parts and their relationship to defect control non-conformance;</li> <li>• Transport Canada issue instructions and amend appropriate training programs for Airworthiness Inspectors to direct them that: <ol style="list-style-type: none"> <li>a. defect control non-conformance within a company may be an indication of an insufficient inventory of spare parts;</li> <li>b. audits or inspections of the defect control system will be a matter of priority during surveillance of the air carrier; and,</li> </ol> </li> </ul>

### Part III: Implementation Measures

Recommendations	Implementation Measures
<p>MCR 61</p> <p>Transport Canada approve a complete copy of the air carrier's operations manual prior to the granting of an operating certificate or an amendment to an operating certificate, and that it approve all amendments and insertions made to that manual.</p>	<p>c. non-compliance in this area may result in suspension of the AMO and/or operating certificate;</p> <ul style="list-style-type: none"> <li>• The above provisions supersede and/or replace all existing references to spare parts, in particular, ANO Series VII, No. 2, and Chapter 573.105 of the Airworthiness Manual, or their proposed regulatory equivalents;</li> <li>• Transport Canada issue instructions and amend appropriate training programs for Airworthiness Inspectors to direct them in the application of the above new rules. These instructions should also direct the discontinuance of past practices based on inconsistent application of previous rules.</li> </ul> <p><b>Status: Under Way. (MCRs 58, 59, 60)</b></p> <p>For MCR 61 See MCR 65</p>

### Part III: Implementation Measures

Recommendations	Implementation Measures
<p><b>MCR 62</b></p> <p>Transport Canada proffer for enactment an amendment to Air Navigation Order Series VII, No. 2, requiring Transport Canada to approve one aircraft operating manual for each type of aircraft operated by the air carrier. It is further recommended that such approval be required prior to the granting of an operating certificate or an amendment to an operating certificate by Transport Canada to the air carrier to allow the commercial use of that aircraft type by the air carrier.</p> <p><b>MCR 63</b></p> <p>Transport Canada proffer for enactment an amendment to Air Navigation Order Series VII, No. 2, requiring each air carrier to provide to Transport Canada an air carrier cabin attendant manual for review and approval, either as part of the flight operations manual or as a separate manual.</p>	<p>For MCR 62 See MCR 65</p> <p><b>MCR 63</b></p> <ul style="list-style-type: none"> <li>◦ the requirement for a Flight Attendant Manual approved by Transport Canada be incorporated into the Canadian Aviation Regulations;</li> <li>◦ the Flight Attendant Manual Standard developed and approved through the Dryden Commission Implementation Project be incorporated by reference into the Canadian Aviation Regulations.</li> </ul> <p><b>Status: Implemented.</b></p>

### Part III: Implementation Measures

Recommendations	Implementation Measures
<p>MCR 64</p> <p>Transport Canada proffer for enactment an amendment to Air Navigation Order Series VII, No. 2, deleting the existing tests contained in sections 5, 6, and 33 and replacing them with tests containing the wording "high degree of safety" and "highest degree of safety". Such wording is similar to wording contained in equivalent United States Federal Aviation Regulation legislation dealing with standards and procedures for Air Carriers using large aircraft.</p> <p>MCR 65</p> <p>Transport Canada proffer for enactment legislation requiring an air carrier to submit its operations manual as defined in Air Navigation Order Series VII, No. 2, to Transport Canada and have it approved prior to the issuance by Transport Canada of an operating certificate or any amendment thereto.</p>	<p>For MCR 64 See MCR 106</p> <p>MCRs 61, 62, 65</p> <ul style="list-style-type: none"> <li>• Transport Canada adopt the proposed Canadian Aviation Regulations and attendant Standards which will require an air carrier to amend its Company Operations Manual when there is a change to any aspect of its operation, or when required by the Minister. The following revisions will be incorporated: <ul style="list-style-type: none"> <li>- a Company Operations Manual be defined as any document that provides operational guidance or direction to company personnel and is approved, in whole or in part, by the Minister;</li> <li>- the proposed regulations clearly identify what sections of a Company Operations Manual are mandatory and require that Transport Canada approve these mandatory sections;</li> <li>- procedures to ensure that the development and approval of company operations manuals are completed in a timely manner.</li> </ul> </li> </ul> <p>Status: Implemented. (MCRs 61, 62, 65)</p>

## Part III: Implementation Measures

Recommendations	Implementation Measures
<p>MCR 66</p> <p>Transport Canada ensure that air carriers follow and comply with those sections of the operations manuals required by Air Navigation Order Series VII, No. 2.</p>	<p>MCR 66</p> <ul style="list-style-type: none"> <li>• Transport Canada ensure compliance with the appropriate <i>Air Regulations</i> and Air Navigation Orders through effective operation of its air carrier inspection program as outlined in Section 8.4; "An Air Carrier Inspection System" of the Air Carrier Inspection Task Force Report (ACITF).</li> <li>• To provide clear standards for compliance, that a consistent and interrelated structure of operations procedures and component manuals be required by the <i>Air Regulations</i> under the category of the operations manual as specified in Sections 3.2.17 and 9.2 of the ACITF Report.</li> </ul> <p>These measures are based on a set of regulatory standards providing easy reference for industry and Transport Canada Inspectors as well as firm inspection and audit policies.</p> <p><b>Status: Implemented.</b></p>
<p>MCR 67</p> <p>Transport Canada ensure that a systematic and comprehensive discussion of cold soaking be inserted in Air Carriers' flight operations manuals and/or aircraft operating manuals and in Transport Canada publications such as the Aeronautical Information Publication, to make all pilots and aviation operational personnel aware of the insidious nature of the cold-soaking phenomenon and the various factors that may cause contamination to adhere to aircraft lifting surfaces.</p>	<p>MCR 67</p> <ul style="list-style-type: none"> <li>• Information on cold soaking, based on a paper prepared by the Air Industries Association of Canada (AIAC) and included as an attachment to the Task Group report on MCR 67, be published in the Aeronautical Information Publication and in the Notice to Aircraft Maintenance Engineers and Aircraft Owners, to be incorporated at the time of their next revision;</li> </ul>

### Part III: Implementation Measures

Recommendations	Implementation Measures
<p>MCR 68</p> <p>Transport Canada ensure that all air carrier pilot flight training be conducted in aircraft flight simulators to the maximum extent possible.</p>	<ul style="list-style-type: none"> <li>• The Transport Canada de-icing/anti-icing training package, as regulated by Air Navigation Orders, Section VII, Nos. 2, 3, and 6, be revised to incorporate the information covered in the paper and any other pertinent information. The availability of the new video could be published in the Aeronautical Information Publication and the Notice to Aircraft Maintenance Engineers and Aircraft Owners (now called Airworthiness Notices). The revision of the Transport Canada training package should take place so that air carriers are able to revise their training programs and manuals in time for the 1994 icing season;</li> <li>• Approval of the de-icing/anti-icing training program of air carriers be contingent on the addition of information on cold soaking, in accordance with Transport Canada's updated training package, and on the revision of the examination to evaluate the student's knowledge of cold soaking.</li> </ul> <p><b>Status: Implemented.</b></p> <p>For MCR 68 See MCR 71</p>

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Recommendations	Implementation Measures
<p>MCR 69</p> <p>Transport Canada ensure that an air carrier, if it does not have pilots with the requisite and necessary flight experience on the aircraft when it introduces a new aircraft type, provide sufficient non-revenue flying time for its pilots to enable them to gain the requisite experience.</p> <p>MCR 70</p> <p>Transport Canada encourage air carriers lacking pilots with sufficient experience on a new aircraft type to provide highly experienced pilots from outside the air carrier to assist in training the air carrier's pilots and to fly with them until they have gained an adequate level of flight experience on the new aircraft type.</p>	<p>For MCR 69 See MCR 71</p> <p>MCR 70</p> <p>The policy governing the use of foreign-licensed pilots for training and checking purposes be simplified by eliminating requirements (b) through (f) of the existing policy and by allowing the use of foreign-licensed pilots for checking, when a qualified person is not available in Canada. The sections eliminated as noted above are:</p> <ul style="list-style-type: none"> <li>b) be adequately briefed by the air carrier and show knowledge of applicable Canadian regulation to an Air Carrier Inspector (ACI);</li> <li>c) complete Company Indoctrination Training;</li> <li>d) complete Emergency Procedures Training;</li> <li>e) display knowledge of air carrier standard operating procedures through satisfactory completion of the Pilot Proficiency Check (PPC) conducted by an ACI; and</li> <li>f) complete a satisfactory line check conducted by an ACI.</li> </ul> <p>Appendix B of the Task Group Report on MCR 70 contains the proposed new wording of the policy. It is also proposed that Transport Canada continue to encourage air carriers to use highly experienced pilots from outside the carrier for training purposes.</p> <p><b>Status: Implemented.</b></p>

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Recommendations	Implementation Measures
<p>MCR 71</p> <p>Transport Canada proffer for enactment legislation with respect to flight crew pairing, requiring that one of the flight crew members, either the pilot-in-command or the first officer, have substantial flight experience on the aircraft type.</p>	<p>MCRs 68, 69, 71</p> <p><b>For Simulator Training:</b></p> <ul style="list-style-type: none"> <li>the new policy on simulator use for pilot training proposed by the Aviation Regulation Directorate be incorporated, with the following amendments, into the Canadian Aviation Regulations: <ul style="list-style-type: none"> <li>for turbo-jet aircraft of 50 or more seats, all initial and recurrent training be conducted on a simulator and a flight training device (FTD) certified to Level 4 or higher;</li> <li>for aircraft that belong to the Other Airline Category, all initial and recurrent training be conducted on a combination of an FTD certificated to Level 4 or higher and a simulator or a combination of an FTD certificated to Level 6 or higher and the aeroplane;</li> <li>the configuration of the FTDs used in this training closely resemble that of the aircraft used by the air carrier;</li> <li>the reference in the proposed policy to FTD under Commuter Category read Level 6.</li> </ul> </li> </ul> <p><b>For Line Indoctrination:</b></p> <ul style="list-style-type: none"> <li>the existing requirements for Line Indoctrination be replaced with the following and incorporated into the Canadian Aviation Regulations:</li> </ul>

### Part III: Implementation Measures

Recommendations	Implementation Measures
	<ul style="list-style-type: none"><li>- the required number of flying hours and sectors, as outlined below, apply to both the captain and the first officer;</li><li>- initial Line Indoctrination be required for crew members who have not qualified and served in the same capacity on the same group of aircraft;</li><li>- transition Line Indoctrination be required for crew members who have qualified and served in the same capacity on the same group of aircraft;</li><li>- both Initial and Transition Line Indoctrination be conducted under the supervision of a training pilot who meets the commercial air service standards;</li><li>- during Initial Line Indoctrination, the captain and first officer be required to perform the duties of his or her position, with the training pilot required to occupy the opposite crew operating position;</li><li>- during Transition Line Indoctrination, the captain and first officer be required to perform the duties of his or her position. The training pilot would be allowed to occupy the jump seat, if the transitioning pilot has completed at least 2 sectors as pilot flying and has satisfactorily demonstrated to the training pilot that he or she is qualified to perform the duties of his or her position;</li><li>- specific requirements for Initial Line Indoctrination on aircraft with reciprocating powered engines be as follows:</li></ul>

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Recommendations	Implementation Measures
	<ul style="list-style-type: none"> <li>- each pilot be required to perform a mandatory list of operating manoeuvres and procedures and to complete 15 flying hours and 4 mandatory sectors, 2 to be performed as pilot flying and 2 as pilot not flying;</li> <li>- after completing 4 mandatory sectors, the remaining time may be reduced by 1 hour for each additional sector flown to a maximum 50% reduction of the original time requirement;</li> <li>- Specific requirements for Initial Line Indoctrination on aircraft with turbo-propeller powered engines be as follows:</li> <li>- each pilot be required to perform a mandatory list of operating manoeuvres and procedures and to complete 20 flying hours and 4 mandatory sectors, 2 to be performed as pilot flying and 2 as pilot not flying;</li> <li>- after completing 4 mandatory sectors, the remaining time may be reduced by 1 hour for each additional sector flown to a maximum 50 % reduction of the original time requirement;</li> <li>- Specific requirements for Initial Line Indoctrination on aircraft with turbo-jet powered engines be as follows:</li> <li>- each pilot be required to perform a mandatory list of operating manoeuvres and procedures and to complete 25 flying hours and 4 mandatory sectors, 2 to be performed as pilot flying and 2 as pilot not flying;</li> <li>- no reduction of the original time requirement would be</li> </ul>

### Part III: Implementation Measures

Recommendations	Implementation Measures
	<p>permitted;</p> <ul style="list-style-type: none"> <li>- Specific requirements for Transition Line Indoctrination on aircraft with reciprocating powered engines be as follows: <ul style="list-style-type: none"> <li>- each pilot be required to perform a mandatory list of operating manoeuvres and procedures and to complete 10 flying hours and 4 mandatory sectors, 2 to be performed as pilot flying and 2 as pilot not flying;</li> <li>- after completing 4 mandatory sectors, the remaining time may be reduced by 1 hour for each additional sector flown to a maximum 50% reduction of the original time requirement;</li> </ul> </li> <li>- Specific requirements for Transition Line Indoctrination on aircraft with <b>turbo-propeller</b> powered engines be as follows: <ul style="list-style-type: none"> <li>- each pilot be required to perform a mandatory list of operating manoeuvres and procedures and to complete 12 flying hours and 4 mandatory sectors, 2 to be performed as pilot flying and 2 as pilot not flying;</li> <li>- after completing 4 mandatory sectors, the remaining time may be reduced by 1 hour for each additional sector flown to a maximum 50% reduction of the original time requirement;</li> </ul> </li> <li>- Specific requirements for Transition Line Indoctrination on aircraft with <b>turbo-jet</b> powered engines be as follows: <ul style="list-style-type: none"> <li>- each pilot be required to perform a mandatory list of operating</li> </ul> </li> </ul>

### Part III: Implementation Measures

Recommendations	Implementation Measures
	<p>manoeuvres and procedures and to complete 25 flying hours and 4 mandatory sectors, 2 to be performed as pilot flying and 2 as pilot not flying;</p> <p>- After completing 4 mandatory sectors, the remaining time may be reduced by 1 hour for each additional sector flown to a maximum 50% reduction of the original time requirement;</p> <p><b>For Consolidation:</b></p> <ul style="list-style-type: none"> <li>the Canadian Aviation Regulations add a new requirement, in the appropriate place and manner, for a consolidation period whenever line indoctrination and a line check are required, except when a first officer is upgraded to captain on the same aircraft type;</li> <li>the consolidation period take place in accordance with one of the following time limits and begin upon successful completion of the Pilot Proficiency Check: <ul style="list-style-type: none"> <li>- 50 hours in 60 days,</li> <li>- 75 hours in 90 days, or</li> <li>- 100 hours in 120 days;</li> </ul> </li> <li>if the consolidation period is not completed within 120 days, an extension to 150 days be permitted, at the air carrier's discretion, under the following condition. On or before the 120th day, the air carrier must made a ground evaluation of the pilot's level of proficiency, and if the pilot is assessed as not possessing a satisfactory level of competence, he or she must undergo additional training, followed by a supervised line operating flight, after which the consolidation period may be extended to 150 days. If the pilot's</li> </ul>

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Recommendations	Implementation Measures
	<p>proficiency is judged satisfactory, he or she must be observed in a supervised line operating flight, and if the results of the latter are satisfactory, the consolidation period may be extended;</p> <ul style="list-style-type: none"> <li>• if at any time before the consolidation period ends a pilot is assigned to another aircraft type, he or she must undergo refresher training with an instructor or check pilot before resuming the consolidation process;</li> <li>• if the pilot fails to complete the consolidation requirements in the maximum time of 150 days allowed, the complete line indoctrination and consolidation period requirements must be repeated;</li> </ul> <p><b>For Crew Pairing:</b></p> <ul style="list-style-type: none"> <li>• the Canadian Aviation Regulations add a new requirement, in the appropriate place and manner, for crew pairing restrictions that would apply under the following circumstances: <ul style="list-style-type: none"> <li>- upon initial appointment to first officer;</li> <li>- upon the first upgrade from first officer to captain on any aircraft type;</li> <li>- upon transition from a reciprocating-powered aircraft to a turbo-prop or turbo-jet powered aircraft;</li> <li>- upon transition to an aircraft whose control systems use a technology or present information in a manner that differs significantly in access, interpretation, or usage from that with</li> </ul> </li> </ul>

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Recommendations	Implementation Measures
	<p>which the pilot is familiar. Examples of such a transition are the first glass cockpit or the first fly-by-wire;</p> <ul style="list-style-type: none"> <li>- upon completion of training on a second aircraft type, regardless of previous experience, when the pilot will be flying both types of aircraft in service;</li> <li>- crew pairing restrictions be required upon successful completion of the Pilot Proficiency Check, run concurrent with line indoctrination and the consolidation period, and continue until completion of the latter;</li> <li>- the sliding scale for the consolidation period apply to crew pairing restrictions;</li> <li>- after completion of line indoctrination, the more experienced crew member must be one of the following:             <ul style="list-style-type: none"> <li>- a pilot who has completed the consolidation period in position for that aircraft type,</li> <li>- a training pilot who meets the commercial air service standards and who may occupy the jump seat, or</li> <li>- a pilot who has gained experience in position on the aircraft type prior to the introduction of consolidation requirements;</li> </ul> </li> </ul> <p><b>For Guidance Material:</b></p> <ul style="list-style-type: none"> <li>• ways in which new air carriers and those introducing or</li> </ul>

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Recommendations	Implementation Measures
<p>MCR 72</p> <p>Transport Canada routinely inspect the activities of aircraft fuellers and ground-handling personnel, to ensure that they are properly performing their duties and to ensure that these personnel have received adequate training.</p> <p>MCR 73</p> <p>Transport Canada ensure that all ground-handling personnel, whether employed by the air carrier or by a contract agent, receive ground-handling training on all aircraft types that they will be required to handle. If personnel are required to refuel aircraft, they should also have knowledge of proper fuelling procedures.</p>	<p>reintroducing new aircraft types can fulfil line indoctrination, consolidation, and crew pairing requirements be included as guidance material to the Canadian Aviation Regulations, Part VII, to ensure that air carriers are aware of all the alternatives available to them.</p> <p><b>Status: Implemented. (MCRs 68, 69, 71)</b></p> <p>For MCR 72 See MCR 79</p> <p>For MCR 73 See MCR 79</p>

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Recommendations	Implementation Measures
<p><b>MCR 74</b></p> <p>Transport Canada proffer for enactment regulations setting the training and competency requirements for cabin attendants.</p>	<p><b>MCR 74</b></p> <ul style="list-style-type: none"> <li>the standards for instructor qualifications, flight attendant requalification, flight attendant competency and flight attendant training be incorporated by reference into the Canadian Aviation Regulations;</li> <li>the "Flight Attendant Qualification Requirements" be incorporated into the Canadian Aviation Regulations;</li> <li>Cabin Safety Inspectors receive training to administer the "Standards".</li> </ul> <p><b>Status: Implemented.</b></p>
<p><b>MCR 75</b></p> <p>Transport Canada monitor and periodically audit the cabin attendant training program of all air carriers to ensure that such training meets the standards set.</p>	<p><b>MCR 75</b></p> <p>It is Transport Canada's policy to monitor cabin attendant training programs.</p> <p><b>Status: Implemented.</b></p>
<p><b>MCR 76</b></p> <p>Transport Canada ensure that the flight operations manuals of all air carriers specify that hot refuelling is an abnormal and potentially dangerous procedure and that they outline in detail the appropriate procedures to be followed in order to conduct hot refuelling safely.</p>	<p><b>MCR 76</b></p> <p>The Commercial Air Services Standards, which will amplify Part VII of the Canadian Aviation Regulations, require air carriers to state in their Operations Manuals their policy with regard to the refuelling of an aircraft with an engine running, and if the air carrier does not allow it, to</p>

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Recommendations	Implementation Measures
<p>MCR 77</p> <p>Transport Canada, during the process of approval of air carrier manuals, ensure that the provisions of the proposed manuals are consistent and, specifically, that they coordinate the duties of the cabin crew with those of the flight crew concerning hot-refuelling procedures, with appropriate cross referencing between the manuals.</p>	<p>make a statement to this effect. If the air carrier's policy does allow refuelling with an engine running, the Operations Manual must specify that it is not standard practice and detail the procedures to be followed, which would include at least the following elements:</p> <ul style="list-style-type: none"> <li>a) a prohibition against refuelling with passengers on board the aircraft;</li> <li>b) the permissible distance of the aircraft from the passengers and terminal buildings;</li> <li>c) a stipulation that the entire refuelling operation be monitored;</li> <li>d) a description of how the refuelling is to be conducted;</li> <li>e) a description of the bonding procedures to be used; and,</li> <li>f) a stipulation that cargo may not be loaded during refuelling.</li> </ul> <p><b>Status: Implemented.</b></p> <p>MCR 77</p> <ul style="list-style-type: none"> <li>• Transport Canada amend the appropriate sections of the commercial air services standards to require that an air carrier's manuals, or the sections of manuals pertaining to different employee groups, be consistent with each other and appropriately cross-referenced. It is also proposed that the Commercial Air Services Standards require that the duties described in these manuals be properly coordinated;</li> <li>• The list of subjects prepared by the DCIP be used as a basis for the development of guidelines to be incorporated into the Air Carrier Inspector Manual (TP 3783), the Manual of Regulatory Audits (TP 8606), and the Passenger Safety Inspection Manual, as appropriate,</li> </ul>

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Recommendations	Implementation Measures
<p>MCR 78</p> <p>Transport Canada ensure that all aircraft fuellers are adequately trained to standards set by Transport Canada.</p> <p>MCR 79</p> <p>Transport Canada ensure the adequate monitoring of aircraft fuelling procedures at Canadian airports.</p>	<p>on the subject areas to be examined in air carrier Operations Manuals and Flight Attendant Manuals to ensure that these manuals are consistent and appropriately cross-referenced and that the duties of flight and cabin crew they describe are properly coordinated;</p> <ul style="list-style-type: none"> <li>The above list also be used as the basis for the development of guidelines for air carriers to ensure that their manuals are consistent with each other and appropriately cross-referenced and that the duties they describe are properly coordinated. These guidelines would be published as an Air Carrier Advisory Circular.</li> </ul> <p><b>Status: Implemented.</b></p> <p>For MCR 78 See MCR 79</p> <p>MCRs 28, 29, 72, 73, 78, 79</p> <ul style="list-style-type: none"> <li>Transport Canada ensure that aviation fuelling operations are regularly and systematically monitored, subject to the same risk analysis as the other elements of its aviation surveillance program;</li> <li>where an operator contracts the receiving of aviation fuel to a third party, the contractor be required to follow the air operator's procedures for the receipt of fuel, as outlined in its approved Maintenance Control Manual, and that the receiving activities of the</li> </ul>

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Recommendations	Implementation Measures
	<p>contractor's employees be monitored as if they were employees of the air operator;</p> <ul style="list-style-type: none"> <li>the aviation fuelling standards that will be contained in the Commercial Air Services Standards and written in support of section 706.12 of the Canadian Aviation Regulations include requirements for the quality control, storage, handling, and dispensing of aviation fuel;</li> <li>the fuelling/defuelling checklist contained in the "Manual of Regulatory Audits" be revised to take into account the new requirements of sections 706.12 and 706.13 of the proposed Canadian Aviation Regulations;</li> <li>technical information and training guidelines covering the quality control, storage, handling, and dispensing of aviation fuel, in the form of an aviation fuelling document, be prepared and distributed by Transport Canada to private and commercial air operators, fuel supply companies, fuel-handling agents, airports, and aerodromes;</li> <li>the training guidelines contained in the proposed aviation fuelling document specifically state that all ground-handling personnel who fuel aircraft should be adequately trained to fulfil their duties and that all fuel-handling personnel, including ground-handling personnel, should be trained on all aircraft types that they will be required to fuel;</li> <li>the Airports Group's "Policy and Standards on the Storage, Handling, and Dispensing of Aviation Fuel at Transport Canada-Owned Airports" (TP 2231) be reviewed once the aviation fuelling</li> </ul>

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Recommendations	Implementation Measures
<p>MCR 80</p> <p>Transport Canada encourage air carriers to adjust their operational procedures and policies, where technically feasible, to permit the de-icing of an aircraft with a main engine running.</p> <p>MCR 81</p> <p>Transport Canada ensure that the intention of the "clean-wing" concept, as embodied in Recommendations MCR 2 and 3 above and in recent amendments to the <i>Air Regulations</i> (SOR/90-757) and the Air Navigation Orders (SOR/90-758 and SOR/90-759), be incorporated into and given effect in the appropriate operational manuals of Canadian air carriers.</p>	<p>document has been prepared in order to ensure that the requirements of the former are consistent with those of the latter;</p> <ul style="list-style-type: none"> <li>two or three years after the distribution of the aviation fuelling document, an evaluation be made of its usefulness.</li> </ul> <p><b>Status: Under Way. (MCRs 28, 29, 72, 73, 78, 79)</b></p> <p>MCR 80</p> <p>It was determined that an Air Carrier Advisory Circular be distributed to encourage air carriers to allow their aircraft to be de-iced/anti-iced with the main engines running, where technically feasible; to describe, as part of their Ground Icing Operations Program, the procedures to be followed for each aircraft type; and to train their operational personnel in the proper use of these procedures.</p> <p><b>Status: Implemented.</b></p> <p>MCR 81</p> <p>It was determined that the Manual of Regulatory Audits, the Air Carrier Inspector Manual, the Cabin Safety Inspection Manual, and the Master Training Manual be amended to state that inspectors are required to ensure that all applicable operations manuals incorporate a statement indicating the Company's intention to operate in accordance with paragraph 540.2 of the <i>Air Regulations</i>.</p>

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Recommendations	Implementation Measures
<p>MCR 82</p> <p>Transport Canada ensure, during its normal certification and inspection of Canadian air carriers, that the air carriers have well-organized and effective systems in place for the coordinated distribution to all pilots and operational personnel of comprehensive operational information - including, but not limited to, information regarding aircraft ground de-icing procedures.</p>	<p>Air carrier operations manuals also be reviewed, and amended where necessary, to ensure they include the appropriate reference to the Regulation.</p> <p>This should be implemented by Transport Canada once the currently proposed amendment to <i>Air Regulation 540.2</i> has become law.</p> <p><b>Status: Implemented.</b></p> <p>MCR 82</p> <ul style="list-style-type: none"> <li>• The new Regulations require that all air carriers include a description of their operational information dissemination system in their Operations Manuals;</li> <li>• The Manual of Regulatory Audits (TP8606) be amended to include the requirement to audit the effectiveness of an air carrier's operational information dissemination system;</li> <li>• The Air Carrier Inspector Manual (TP3783) be amended to define the scope of the audit required to verify an air carrier's operational information dissemination system. It should also be clearly stated that the air carrier may propose any of a variety of systems, from electronic distribution to a sign-off book in operations.</li> </ul> <p><b>Status: Implemented.</b></p>

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Recommendations	Implementation Measures
<p>MCR 83</p> <p>Transport Canada give serious consideration to appointing an appropriately qualified person as a national resource specialist dedicated to all matters pertaining to aircraft surface contamination and the ground de-icing and anti-icing of aircraft in Canada, in the broadest sense, based upon a similar position in the Federal Aviation Administration of the United States and with similar objectives and responsibilities.</p> <p>MCR 84</p> <p>Transport Canada immediately press ahead with appropriate amendments to Air Navigation Order Series II, No. 2, that would require the retrofit of shoulder harnesses and other safety-enhancing features for flight attendant seats on older aircraft types such as the F-28 aircraft.</p>	<p>MCR 83</p> <p>A team of functional specialists be formed to fulfil the role envisioned for a national resource specialist and that the purpose, objectives, scope, accountability, membership, responsibilities, and initial tasks of this team be as proposed by the Dryden Commission Implementation Project.</p> <p><b>Status: Implemented.</b></p> <p>MCR 84</p> <ul style="list-style-type: none"> <li>◦ the Canadian Aviation Regulations, which will replace the existing Air Navigation Orders and "Airworthiness Manual," require that each flight attendant required by the operating rules occupy a Transport Canada-approved flight attendant seat in the passenger cabin for take-off and landing;</li> <li>◦ the standards governing flight attendant seats include the following requirements: <p>The flight attendant seat shall be:</p> <ul style="list-style-type: none"> <li>- located in the passenger cabin near approved floor level emergency exits or, because of exit type and distribution, at some other approved exit,</li> <li>- evenly distributed throughout the cabin,</li> <li>- positioned so that the seat will not interfere with the use of a</li> </ul> </li> </ul>

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Recommendations	Implementation Measures
	<p>passageway or exit when the seat is not in use,</p> <ul style="list-style-type: none"> <li>- equipped with a combined safety belt and double parallel shoulder harness with a single point release, designed to the inertia load factors established under the certification basis of the aeroplane. There must also be a means to secure each combined safety belt and shoulder harness when not in use to prevent interference with rapid egress in an emergency,</li> <li>- either forward or aft facing,</li> <li>- provide an energy absorbing rest to support the arms, shoulders, head and spine,</li> <li>- provide access to the communication system when the flight attendant is seated, except when the communication system and flight attendant seat are installed in accordance with the certification basis of the airplane, and</li> <li>- located to minimize the probability of injury to the occupant from items dislodged in a galley or from a stowage compartment or serving cart. Secondary latching mechanisms must be used to prevent items from becoming dislodged.</li> </ul> <p><b>Status: Under Way. (ANO II, No. 2 covers the shoulder harness requirement, the above safety-enhancing features are being incorporated into the new standards).</b></p>

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Recommendations	Implementation Measures
<p>MCR 85</p> <p>Transport Canada assess and amend, as necessary, the procedures required to enact aviation safety-related legislation so as to avoid the bureaucratic process that has delayed the enactment of flight attendant shoulder harness and other important aviation safety-related legislation for the 12-year period since similar legislation was enacted in the United States.</p>	<p>MCR 85</p> <p>The <i>Aeronautics Act</i> was amended accordingly on March 19, 1992.</p> <p>This amendment was specifically designed for fast-track processing of legislative actions that emanate from inquiry recommendations, coroner's inquests and any other such authorities established to investigate and make recommendations.</p> <p><b>Status: Implemented.</b></p>
<p>MCR 86</p> <p>Transport Canada ensure that individuals from aviation industry positions are not placed on Transport Canada hiring or selection committees where there is any appearance of those individuals having a conflict of interest between their industry positions and their positions on the selection committee.</p>	<p>MCR 86</p> <p>Transport Canada, Aviation will ensure that individuals from aviation industry positions are not placed on Transport Canada hiring or selection committees.</p> <p><b>Status: Implemented.</b></p>
<p>MCR 87</p> <p>Transport Canada re-examine its regulatory requirements pertaining to air carrier operational control and flight watch systems, and that it consider putting into place the four-tiered scheme for such systems discussed in chapter 23, Operational Control, of my Final Report.</p>	<p>MCR 87</p> <ul style="list-style-type: none"> <li>• Transport Canada adopt the four-tiered classification of operational control systems developed by the DCIP as the basis for a Standard;</li> <li>• The proposed Standard be made an integral part of a larger standard, which is being prepared by Transport Canada and which is to be enabled by <i>Air Regulations</i>;</li> </ul>

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Recommendations	Implementation Measures
<p>MCR 88</p> <p>Transport Canada proffer for enactment legislation requiring the licensing of flight dispatchers as a prerequisite to their acting as flight dispatchers and training to standards set by Transport Canada, including the passing of appropriate Transport Canada licensing examinations. I commend for Transport Canada's consideration the Federal Aviation Administration licensing regime for flight operational officers (flight dispatchers) in the United States.</p>	<ul style="list-style-type: none"> <li>• An <i>Air Regulation</i> be promulgated requiring an air transport service to comply with the requirements of the proposed standard and to describe its operational control system in its approved Operations Manual;</li> <li>• When formulating standards for systems of operational control, that Transport Canada use the definitions of the basic terms related to operational control established by the DCIP;</li> <li>• Transport Canada establish a specialist inspector position, based at its headquarters, to act as the office of primary interest (OPI) for standards, audits, and inspector training in the areas of dispatch, flight watch, and operational control systems. As a prerequisite for the proposed position, the specialist inspector should have extensive experience as a dispatcher.</li> </ul> <p><b>Status: Implemented.</b></p> <p>MCR 88</p> <ol style="list-style-type: none"> <li>1) The Canadian Aviation Regulations, Part VII, include the following two stipulations under Division VIII, which governs Personnel Requirements: <ul style="list-style-type: none"> <li>- no air operator shall permit and no person shall exercise operational control as a flight dispatcher unless that person holds a valid Flight Dispatcher Certificate issued by the Minister certifying</li> </ul> </li> </ol>

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Recommendations	Implementation Measures
	<p>that the flight dispatcher has met the training requirements specified in the Flight Dispatcher Specific Training Standard;</p> <p>- every air operator that employs a flight dispatcher in an approved co-authority operational control system shall report to the Minister: the initial issue of all Flight Dispatcher Certificates and when a flight dispatcher no longer meets the conditions required to hold a Flight Dispatcher Certificate.</p> <ol style="list-style-type: none"> <li>2) A Canadian Aviation Document called the Flight Dispatcher Certificate be developed.</li> <li>3) The Flight Dispatcher Specific Training Standard be incorporated into the Standards enabled by the CARs.</li> <li>4) The Flight Dispatcher Training Guidelines be included in the Guidelines that will accompany the CARs.</li> <li>5) A Study and Reference Guide for Generic Flight Dispatcher Training be developed.</li> <li>6) The Personnel Licensing Branch be responsible for administering two flight dispatcher generic examinations similar to those used for licensing purposes: one on the Meteorology-related subjects and the other on the remaining subjects.</li> <li>7) In consultation with air operators, Canadian Air Line Dispatchers Association, Environment Canada, Personnel Licensing and Air Carrier Inspection Branches develop and administer examinations to test the level of proficiency attained by flight dispatcher trainees</li> </ol>

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Recommendations	Implementation Measures
	<p>who have completed generic training.</p> <p>8) The Air Carrier Inspection Branch institute a system for certifying flight dispatchers by appointing Authorized Persons at air operators with approved co-authority operational control systems to issue Flight Dispatcher Certificates on behalf of the Minister.</p> <p>9) A new Headquarters inspector position be established (see proposal for MCR 87).</p> <p>10) Guidance material be provided to air carrier inspectors.</p> <p>11) The training courses of Transport Canada's air carrier inspectors be expended to impart a detailed knowledge of the related regulations, standards and guidelines.</p> <p>12) Air operators required to employ flight dispatchers in a co-authority operational control system be subject to the following implementation provisions:</p> <p>a) all air operators be given 24 months from the date of proclamation of the CARs to be in full compliance;</p> <p>b) all air operators be required to submit to Transport Canada for approval all proposed flight dispatcher specific training syllabi no later than 6 months after the date of proclamation of the CARs;</p> <p>c) any person working as a flight dispatcher during the implementation period above, who fails a Transport Canada generic examination would not be allowed to exercise operational</p>

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Recommendations	Implementation Measures
<p>MCR 89</p> <p>That pending implementation of Recommendation MCR 88 above, Transport Canada direct its air carrier inspectors to be diligent in ensuring that flight dispatchers who exercise any operational control over flights meet the minimum training requirements of Air Navigation Order Series VII, No. 2.</p>	<p>control as a flight dispatcher until both the examinations were passed.</p> <p><b>Status: Implemented.</b></p> <p>MCR 89</p> <p>Transport Canada prepare and issue a policy letter urging increased diligence during audits, inspections and monitoring of dispatch systems in accordance with the following principles:</p> <ol style="list-style-type: none"> <li>1. Require regions to examine ANO VII, No. 2 air carriers to identify individuals, other than the Director of Flight Operations or pilots, who exercise any degree of operational control.</li> <li>2. Encourage the carrier to specify in their Flight Operations Manual or other company document, the manner in which it ensures these individuals have adequate knowledge and ability to satisfy the requirements of ANO VII No. 2, S.15 (6) &amp; (7).</li> <li>3. Inspect to ensure these individuals have satisfactorily demonstrated to the carrier knowledge and ability in accordance with ANO VII No. 2, S.15 (6) &amp; (7) and that there is a record with the carrier to this effect.</li> <li>4. Where the carrier specifies dispatcher training, verify it is being followed.</li> </ol>

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Recommendations	Implementation Measures
<p>MCR 90</p> <p>Transport Canada proffer for enactment amendments to Air Navigation Order Series VII, No. 2, that spell out minimum acceptable requirements for an operational flight plan (flight release).</p>	<p>While the preceding principles apply primarily to ANO Series VII, No. 2 air carriers, the task group recommends their application to air carriers operating under ANO Series VII, No. 3 and 6 that utilize persons other than the Director of Flight Operations or pilot who exercise any degree of operational control.</p> <p>Particular attention should be paid to the provisions of the Manual of Regulatory Audits relating to Dispatch/Flight Watch.</p> <p>This policy letter should then be included in the next amendment to the Air Carrier Inspector Manual as the initial provisions of a dedicated chapter on Flight Watch and Operational Control Systems.</p> <p>An Air Carrier Advisory Circular be issued incorporating the principles as stated above, encouraging carriers to specify in their F.O.M. or other company document, the manner in which they ensure dispatchers have adequate knowledge and ability to satisfy the requirements of ANO VII No. 2, S.15 (6) &amp; (7) and to advise carriers of the increased attention that will be paid by Transport Canada to their flight watch and dispatch systems.</p> <p><b>Status: Under Way.</b></p> <p>For MCR 90 See MCR 96</p>

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Recommendations	Implementation Measures
<p>MCR 91</p> <p>Transport Canada direct air carrier inspectors to be diligent during in-flight and base inspections in monitoring the accuracy of operational flight releases.</p> <p>MCR 92</p> <p>Transport Canada, when approving air carrier manuals, ensure that flight dispatcher training qualifications set out in a flight dispatcher training manual are no less comprehensive than those requirements set out in the Air Navigation Orders in all cases where such dispatchers may exercise any operational control over flights.</p> <p>MCR 93</p> <p>Transport Canada initiate a continuing program for the monitoring, inspection, and audit of air carrier flight dispatchers and flight dispatch and flight watch systems, with provision for spot checks and no-notice audits.</p>	<p>MCR 91</p> <p>Transport Canada will continue to communicate the importance of this activity to its inspectors.</p> <p><b>Status: Implemented.</b></p> <p>MCR 92</p> <p>Transport Canada ensures the comprehensiveness of flight dispatcher training qualifications.</p> <p>Transport Canada, as part of its monitoring program, will continue to ensure that there is no discrepancy between provisions of a flight dispatcher training manual and regulatory requirements.</p> <p><b>Status: Implemented.</b></p> <p>MCR 93</p> <p>A new Manual of Regulatory Audits was issued in December 1991 which addresses this concern. This manual is the principal document used to train inspectors in the correct procedures and checklist in the conduct of audits.</p> <p><b>Status: Implemented.</b></p>

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Recommendations	Implementation Measures
<p>MCR 94</p> <p>Transport Canada introduce appropriate amendments to the Air Navigation Order Series VII, No. 2, Part III, so as to describe clearly and definitively where system operations control begins and terminates and where operational control begins and terminates.</p>	<p>MCR 94</p> <ul style="list-style-type: none"> <li>• Transport Canada define the terms "operational control" and "operations coordination" as follows: <ul style="list-style-type: none"> <li>- operational control means the exercise of authority over the formulation, execution, and amendment of an operational flight plan in respect of a flight.</li> <li>- operations co-ordination means the exercise of authority by an air carrier over its operating activities, excluding operational control.</li> </ul> </li> <li>• These terms be used in conjunction with the existing definition of "operational flight plan," as contained in ANO Series VII, No. 2: <ul style="list-style-type: none"> <li>- Operational flight plan means the operator's plan for the safe conduct of a flight, based on consideration of aeroplane performance, other operating limitation, and relevant expected conditions on the route and at the aerodrome concerned;</li> </ul> </li> <li>• Once accepted, these terms be integrated into the upcoming Regulatory Renewal Initiative;</li> <li>• In order to effectively implement the definitions and concepts contained in the Task Group report, the following will be done: <ul style="list-style-type: none"> <li>- Include the definitions of these terms in the definition section of the Air Carrier Operating Rules that deal with flight operations requirements for air carriers.</li> </ul> </li> </ul>

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Recommendations	Implementation Measures
	<ul style="list-style-type: none"> <li>- Integrate these terms into the body of the Operating Rules in such a manner as to define and explain their differences.</li> <li>- Draft regulations that will require all air carriers to describe, in their operations manuals, operating activities with respect to flight operations in terms of the key elements and approved management personnel involved in operational control and operations co-ordination.</li> </ul> <p>The Air Carrier Operating Rules should emphasize that air carriers are to exercise authority over their flight operations by means of operational control and operations co-ordination. The rules should further require air carriers to establish operational control according to standards laid down in specific standards documents, and these standards should vary according to the classification of the air carrier in terms of its type of operation and the aircraft used.</p> <p>The definition of operations co-ordination presented above has been formulated solely to require a carrier to specify those functions that may have an indirect impact on operational control. Description by an air carrier of its operations co-ordination functions will enhance understanding of its total system of flight operations but this requirement should not be made an offence under any air regulation.</p> <p>Transport Canada Air Carrier Operational Standards should make specific use of these terms and concepts in the drafting of standards documents that will be used in the application of new Air Carrier Operating Rules.</p> <p><b>Status: Implemented.</b></p>

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### Part III: Implementation Measures

Recommendations	Implementation Measures
	<p>operational flight plan;</p> <ul style="list-style-type: none"> <li>- the sources of data to be used for fuel requirements and weight calculations;</li> <li>- detailed examples showing how fuel requirements and weight and balance calculations are to be made; and</li> <li>- the operator's procedures for the periodic monitoring of its operational control system to ensure that operational flight plans are accurate and in conformity with the requirements of the proposed standard;</li> </ul> <ul style="list-style-type: none"> <li>• Air transport services be required to store sufficient post-flight data to permit an effective audit of the operational flight plan. It is also proposed that the form in which these data will be stored, as well as the period of time for which they will be retained, be specified;</li> <li>• Transport Canada audit and inspection procedures be reviewed to ensure that the operational flight plan requirements laid down in an air transport service's Operations Manual, especially with regard to fuel and weight calculations, are faithfully and accurately implemented by that service's operational personnel.</li> </ul> <p><b>Status: Implemented. (MCRs 90, 96)</b></p>

### Part III: Implementation Measures

Recommendations	Implementation Measures
<p>MCR 97</p> <p>Transport Canada ensure that any flight watch system required under Air Navigation Order Series VII, No. 2, and approved by Transport Canada, provide for direct pilot-to-dispatch communications from the flight deck, where the necessary communications links exist.</p> <p>MCR 98</p> <p>If a pilot self-dispatch system is to be approved, both Transport Canada and the air carrier ensure that the duties and responsibilities of pilots and dispatchers are clearly and comprehensively covered in the Flight Operations Manual (FOM). It should be made clear in the FOM that no operational decisions are to be made without the captain's agreement.</p>	<p>For MCR 97 See MCR 99</p> <p>MCR 98</p> <ul style="list-style-type: none"> <li>• For air transport services approved to use a self-dispatch operational control system, the appropriate Commercial Air Services Standards amplifying the new Canadian Aviation Regulations for Commuter and Air Taxi Operations contain the following requirements for the content of Operations Manuals: <ul style="list-style-type: none"> <li>- A comprehensive description of the duties and responsibilities of the pilot-in-command and any position providing operational control assistance;</li> <li>- A prohibition against the use of the terms "dispatcher," "flight dispatcher," or "flight operations officer" to refer to the position that provides assistance or support to the pilot-in-command; and</li> <li>- The specification that the pilot-in-command is solely responsible for all decisions related to operational control and that no operational decisions are to be made without the pilot-in-command's agreement.</li> </ul> </li> </ul> <p>Status: Implemented.</p>

### Part III: Implementation Measures

Recommendations	Implementation Measures
<p>MCR 99</p> <p>Transport Canada require all air carriers to have in place a system that requires ground-handling agents to inform dispatch and/or the captain of any significant change to aircraft passenger or freight loads immediately upon such a change becoming known to the ground-handling agent.</p>	<p>MCRs 97, 99</p> <ul style="list-style-type: none"> <li>• The Operational Standards governing airline operations, which will be enabled by the Canadian Aviation Regulations, require air transport services whose operational control systems are classified as Type A or B to identify, as part of the description of their flight watch systems, the circumstances under which flight watch communication is mandatory between the pilot-in-command and the flight dispatcher and to describe their respective duties and responsibilities when making such communications;</li> <li>• The Operational Standards governing air taxi operations, commuter operations, and airline operations require air transport services to specify in their Company Operations Manuals that all ground-handling agents acting on their behalf must inform the applicable flight dispatcher or the pilot-in-command of significant changes to aircraft passenger and freight loads immediately upon such a change becoming known; The Operational Standards governing air taxi operations, commuter operations, and airline operations require air transport services to specify in their Company Operations Manuals that all ground-handling agents acting on their behalf must inform the applicable flight dispatcher or the pilot-in-command of significant changes to aircraft passenger and freight loads immediately upon such a change becoming known.</li> </ul> <p>Status: Implemented. (MCRs 97, 99)</p>

## Part III: Implementation Measures

Recommendations	Implementation Measures
<p>MCR 100</p> <p>Transport Canada proffer for enactment legislation to amend Air Navigation Order Series VII, No. 2, section 5, to include the position of flight safety officer as a required air carrier managerial position.</p>	<p>For MCR 100 See MCR 102</p>
<p>MCR 101</p> <p>Transport Canada proffer for enactment legislation to amend Air Navigation Order Series VII, No. 2, section 5, to require the appointment by an air carrier of a person to the position of flight safety officer for the carrier, the qualifications of such person and the description of the duties and responsibilities of such position to be determined by Transport Canada after consultation with the air carrier industry, and to provide that the flight safety officer shall have direct access on a continuing basis to the chief executive officer of the air carrier in flight safety-related matters.</p>	<p>For MCR 101 See MCR 102</p>
<p>MCR 102</p> <p>Transport Canada initiate a program of consultation with Canadian air carriers and the Transportation Safety Board of Canada with a view to having air carriers institute, staff, and operate, on a continuing basis, an effective flight safety program that is based upon the "Flight Safety Functions," identified in the International Air Transport Association Technical Policy Manual, OPS Amendment No. 37, July 1989, referred to in chapter 24 of my Final Report, Flight Safety.</p>	<p>MCRs 100, 101, 102</p> <p>Transport Canada establish a mandatory flight safety program with senior management accountability. To bring this about, Transport Canada Aviation should:</p> <ul style="list-style-type: none"> <li>• Develop a flight safety program standard based on the draft prepared by the DCIP as well as the flight safety functions applicable to large airline operations outlined in the IATA Technical Policy Manual, OPS Amendment No. 37;</li> </ul>

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Recommendations	Implementation Measures
<p>MCR 103</p> <p>Transport Canada institute a program for the monitoring of the flight safety programs of Canadian air carriers, with a view to ensuring that each air carrier has in place an effective flight safety program that is appropriate for the size and scope of the carrier's operations.</p>	<ul style="list-style-type: none"> <li>• Include in <i>Air Regulation</i> Part VII, Subpart 5, the requirement that:               <ul style="list-style-type: none"> <li>- The air carrier establish and maintain a flight safety program that meets the standard defined in the Commercial Air Services Standards and that is approved by the Minister; and</li> <li>- The operations manager (or equivalent incumbent) be responsible for the flight safety program as defined in the above standard.</li> </ul> </li> </ul> <p><b>Status: Implemented. (MCRs 100, 101, 102)</b></p> <p>MCR 103</p> <ul style="list-style-type: none"> <li>◦ The Aviation Regulation Directorate develop a monitoring program for ensuring air carrier conformance with the requirements of the Flight Safety Program Standard, which will be incorporated into the Commercial Air Services Standards of the Canadian Aviation Regulations. Monitoring would take place as part of the regular air carrier inspection program;</li> <li>◦ The System Safety Directorate be responsible for evaluating air carrier Flight Safety Programs to ensure that they are effective and appropriate to the size and scope of the individual air carrier's operations.</li> </ul> <p><b>Status: Under Way.</b></p>

## Part III: Implementation Measures

Recommendations	Implementation Measures
<p>MCR 104</p> <p>Transport Canada ensure that Air Navigation Order Series VII, No. 2, section 5, be amended to provide a clear statement of the duties, responsibilities, and qualifications for all air carrier management positions set out therein.</p> <p>MCR 105</p> <p>Transport Canada develop standard criteria for the qualifications of all air carrier management positions set out in Air Navigation Order Series VII, No. 2, section 5. Such criteria should include consideration of the following attributes of the respective management candidates:</p> <ul style="list-style-type: none"> <li>o aviation and management experience;</li> <li>o flying experience;</li> <li>o professional licences, such as aircraft maintenance engineer or airline transport rating;</li> <li>o incident and occurrence record;</li> <li>o knowledge of the <i>Aeronautics Act</i>, Air Regulations, and Air Navigation Orders, including air carrier certification requirements and procedures; and</li> <li>o knowledge of the appropriate air carrier manuals necessary for proper performance of duties and responsibilities.</li> </ul>	<p>For MCR 104 See MCR 106</p> <p>For MCR 105 See MCR 106</p>

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Recommendations	Implementation Measures
<p>MCR 106</p> <p>Transport Canada ensure that, once standard criteria referred to in MCR 105 are established and published, all air carrier management candidate approvals be subject to such criteria being fully satisfied.</p>	<p>MCRs 64, 104, 105, 106</p> <p>Subject to the provisions of the Canadian Aviation Regulations governing Air Taxi, Commuter, and Airline operations, the positions of Maintenance Manager, Operations Manager, Chief Pilot, and Training Pilot be mandatory within air carriers; and further that the qualifications and responsibilities developed by the DCIP be incorporated into the Commercial Air Services Regulations and Standards for these air carrier positions.</p> <p>It is also proposed that, should other required positions be added to the Regulations, Transport Canada, in consultation with industry, develop appropriate responsibilities and qualifications for these positions.</p> <p><b>Status: Implemented. (MCRs 64, 104, 105, 106)</b></p>
<p>MCR 107</p> <p>Transport Canada ensure the ongoing and adequate surveillance and monitoring of new aircraft implementation programs by Canadian air carriers.</p>	<p>MCR 107</p> <ul style="list-style-type: none"> <li>• Transport Canada ensure the effective continuing surveillance of the implementation of new levels of air carrier service and new aircraft programs against both current and improved inspection/audit standards.</li> <li>• The inspection standard should be improved with a statement of more detailed standards and guidelines for inspectors in the Air Carrier Certification, Air Carrier Inspector Manuals and Airworthiness Staff Instructions specific to new companies or new service levels. These instructions should be identified separately and include the processes of certification, frequent ramp checks, in-flight</li> </ul>

### Part III: Implementation Measures

Recommendations	Implementation Measures
<p>MCR 108</p> <p>Transport Canada proffer for enactment legislation imposing upon an air carrier concurrent responsibility with the pilot-in-command for the safe and proper crewing, dispatch, and conduct of a flight over which the air carrier exercises any degree of operational control. (The adoption of the United States Federal Aviation Regulation 121 would address this area of concern.)</p>	<p>or other inspections, regional operations and airworthiness management review of compliance progress and an audit at six months after the new service begins. Airworthiness standards and procedures should be integrated into the Air Carrier Certification Manual under joint authorship.</p> <ul style="list-style-type: none"> <li>• No operating certificate ever be issued until all certification criteria are met. Departmental policy should re-inforce this mandate.</li> <li>• A clear and consistent set of national inspection priorities is needed to guide the conduct of the regional inspection program when inspector resources are short.</li> <li>• The regional inspector force be adequately staffed and qualified for appropriate aircraft types in accordance with current policy.</li> </ul> <p><b>Status: Under Way. (See also MCR 111)</b></p> <p>MCR 108</p> <p>The Principles of Responsibility and Authority in Flight Operations and the definitions of the key terms which were developed by the DCIP in response to Recommendation 87, be incorporated, in the appropriate place and manner, into the Canadian Aviation Regulations for Airline, Commuter, and Air Taxi operations currently being developed.</p> <p><b>Status: Implemented.</b></p>

### Part III: Implementation Measures

Recommendations	Implementation Measures
<p>MCR 109</p> <p>Transport Canada ensure that the investigation of any violation of the <i>Air Regulations</i> or Air Navigation Orders committed by an air carrier pilot or an aircraft maintenance engineer include an examination of the air carrier's contribution to the circumstances or environment that may have led to such violation. Where such an investigation reveals that the air carrier's contribution was significant, appropriate and parallel enforcement action should be taken against the air carrier as well as against the individual.</p> <p>MCR 110</p> <p>The Aviation Regulation Directorate focus adequate resources on surveillance and monitoring of the air carrier industry, with emphasis on in-flight inspections and unannounced spot checks.</p>	<p>MCR 109</p> <p>This is Transport Canada's current policy and practice.</p> <p><b>Status: Implemented.</b></p> <p>MCR 110</p> <ul style="list-style-type: none"> <li>the Aviation Regulation Directorate plan to hold Priority Setting Meetings every two years in order to establish its program priorities in a concerted manner and ensure that adequate resources are devoted to the surveillance and monitoring of the air carrier industry;</li> <li>the Regional Offices and Headquarters Branches continue to hold smaller scale priority setting meetings on a regular basis to ensure that their individual programs give priority to the monitoring and surveillance of the air carrier industry;</li> <li>the Aviation Regulation Directorate continue to search for and develop alternate cost-effective ways of achieving its program goals.</li> </ul> <p><b>Status: Implemented.</b></p>

### Part III: Implementation Measures

Recommendations	Implementation Measures
<p>MCR 111</p> <p>Transport Canada establish a policy that identifies surveillance of existing air carriers as a non-discretionary task.</p>	<p>MCR 111</p> <ul style="list-style-type: none"> <li>• Transport Canada develop a hierarchical system of regulatory standards which is clear in structure and provides for "enabled documents". Such documents can be developed and amended by the Department after mandatory consultation with the aviation industry.</li> <li>• Appropriate amendments to the <i>Aeronautics Act</i> define inspection of air carriers (and its subset monitoring activities of audit and surveillance) as a non-discretionary responsibility of the Minister. This proposal should be part of the Aviation Regulation Renewal Project.</li> <li>• Aviation Regulation activities be adequately resourced with a competent air carrier inspector workforce sufficient to perform all non-discretionary tasks completely (or in some cases have workload shared through further delegation to industry).</li> </ul> <p><b>Status: Under Way. (TCA currently finalizing frequency standards for all surveillance tasks).</b></p>

### Part III: Implementation Measures

Recommendations	Implementation Measures
<p>MCR 112</p> <p>Transport Canada establish a contingency policy in order to meet unusual resource demands without jeopardizing adequate staffing of inspection and surveillance functions.</p>	<p>MCR 112</p> <p>Transport Canada has amended the processes for operational planning and budgetary control, that provides for full senior management information and direction on matters affecting operational priorities. Management decision making within the framework of these processes is governed by the principle that safety cannot be jeopardized.</p> <p><b>Status: Implemented.</b></p>
<p>MCR 113</p> <p>Transport Canada pursue extension of the delegation of authority to industry in accordance with the recommendations of Transport Canada's Management Consultant Branch studies completed in 1990 on this subject. Where additional delegation of authority to industry can be achieved safely, such delegation should be authorized in order to allow more effective use of Transport Canada inspectors.</p>	<p>MCR 113</p> <ul style="list-style-type: none"> <li>• Further delegation of authority be given to the industry as authorized by the company check pilot program under the conditions outlined above. This delegation must be given using strict criteria for issue and withdrawal of the privilege, a clear understanding of what constitutes acceptable "conflict of interest", a precise qualification and requalification process and a good performance record by the company concerned in terms of training and checking pilots.</li> <li>• Delegation of check pilot authority be given to individuals within proficient training organizations. The organization must have a record of competent performance and the individual qualify for knowledge and application of company and Canadian regulatory standards.</li> <li>• Company check pilot authority be delegated through the issue of operations specifications to give Transport Canada control of the privilege similar to that of a Canadian aviation document.</li> </ul>

### Part III: Implementation Measures

Recommendations	Implementation Measures
<p>MCR 114</p> <p>Transport Canada establish a policy to ensure that required support staff will be provided so that inspector staff will not be misdirected from their operational safety-oriented surveillance duties in order to perform tasks more appropriately conducted by support staff.</p> <p>MCR 115</p> <p>Transport Canada establish an air carrier inspector training policy to be put into force without further delay, and that the policy ensure the following:</p> <ul style="list-style-type: none"> <li>(a) A clear statement of the requisite competencies for each inspector position in the Airworthiness and Flight Standards directorates of Transport Canada</li> <li>(b) A statement of the training courses required to be completed successfully by inspectors before they are delegated authority and</li> </ul>	<ul style="list-style-type: none"> <li>• Any inspector resources freed by this process be employed in other essential regulatory activities such as in-flight inspections.</li> <li>• Private sector contributions to components of Departmental audits be further evaluated with the object of focusing inspector activities on the more safety-related actions.</li> </ul> <p><b>Status: Implemented.</b></p> <p>For MCR 114 See MCR 124</p> <p>MCR 115</p> <p>It was determined that the "Aviation Regulation Technical Training Policy" developed by the Dryden Commission Implementation Project be adopted for implementation by Transport Canada.</p> <p><b>Status: Implemented.</b></p>

### Part III: Implementation Measures

Recommendations	Implementation Measures
<p>before their probationary periods end.</p> <p>(c) Successful completion of training to be required before air carrier inspectors are delegated their authority credentials.</p> <p>(d) Establishment of a recurrent training program for each discipline of inspection to ensure continued competence.</p> <p>MCR 116</p> <p>Transport Canada improve staffing and recruiting programs to enable aviation regulation requirements to be filled on a high-priority basis. The capability to fast-track such staffing requirements should be achieved as soon as reasonably possible.</p> <p>MCR 117</p> <p>Transport Canada, in consultation with the air carriers, work out an arrangement to accommodate the requirement of no-notice in-flight cabin safety inspections and surveillance on charter flights.</p>	<p>MCR 116</p> <p>Within the limitations of legislation governing employment within the federal public service, steps have been taken to shorten staffing delays to the extent possible. This has included delegation of authority to local managers to full administer their own staffing process, and the establishment of eligibility lists that may be used to staff positions as soon as they become vacant.</p> <p><b>Status: Implemented.</b></p> <p>MCR 117</p> <p>Transport Canada implemented a policy in January 1992 providing for no-notice in-flight cabin safety inspections and surveillance.</p> <p><b>Status: Implemented.</b></p>

### Part III: Implementation Measures

Recommendations	Implementation Measures
<p>MCR 118</p> <p>Transport Canada, as an integral part of any future policy development process, ensure that thorough impact studies be carried out by experienced analysts, knowledgeable in the subject matter, as a prerequisite to government acceptance and implementation of policies that could have a bearing on aviation safety.</p> <p>MCR 119</p> <p>Where a potentially adverse effect on safety is identified, appropriate measures be taken by the government to preclude the effect before the policy is implemented.</p> <p>MCR 120</p> <p>All senior Transport Canada Aviation Group managers have at their disposal knowledge of the current demands being imposed on branches of the department for which they have responsibility.</p>	<p>For MCR 118 See MCR 119</p> <p>MCRs 118, 119</p> <p>The Government of Canada and accordingly Transport Canada, as an integral part of policy development, will consult with functional specialist knowledgeable in the subject matters, as a prerequisite to the acceptance and implementation of policies, particularly those dealing with aviation safety. This includes taking all necessary steps to preclude any potentially negative effects on safety before policies are implemented.</p> <p><b>Status: Implemented. (MCRs 118, 119)</b></p> <p>MCR 120</p> <p>The communications, information distribution, and budgeting systems of the Aviation Group continue to be developed, implemented, and refined on an ongoing basis in order to ensure that senior Aviation Group Managers are kept apprised of the demand for the services of their respective departments.</p> <p><b>Status: Implemented.</b></p>

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Recommendations	Implementation Measures
<p>MCR 121</p> <p>Transport Canada should encourage all Aviation Group managers, at any level, to communicate to their superiors any significant aviation safety concern that has come to their attention and that could affect the Canadian aviation industry and public.</p>	<p>MCR 121</p> <p>Transport Canada has encouraged all Aviation Group managers, at all levels, to communicate to their superiors any significant aviation safety concern that has come to their attention and that could affect the Canadian aviation industry and public. Further reinforcement will be made.</p> <p><b>Status: Implemented.</b></p>
<p>MCR 122</p> <p>Transport Canada put in place a policy directive that if resource levels are insufficient to support a regulatory or other program having a direct bearing on aviation safety, the resource shortfall and its impact be communicated, without delay, to successive higher levels of Transport Canada management until the problem is resolved or until it is communicated to the minister of transport.</p>	<p>MCR 122</p> <p>Transport Canada's operational planning and budgetary control processes, at both the group and corporate levels, provide for a significant degree of management involvement, allowing ample opportunity for resource shortfalls to be communicated to and addressed by the highest levels in the department.</p> <p>The management structure and the information processes have been adjusted to ensure that information regarding safety concerns are transmitted immediately to the most senior levels of the department.</p> <p><b>Status: Implemented.</b></p>
<p>MCR 123</p> <p>An air carrier activity reporting system providing a current and reliable picture of the industry be developed and utilized by Transport Canada to determine program resource needs, levels, and direction.</p>	<p>MCR 123</p> <p>A user requirements and feasibility study for an air carrier industry status and regulatory workload indicator reporting system be conducted.</p>

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Recommendations	Implementation Measures
<p>MCR 124</p> <p>The process of resource allocation, including staffing standards, be reexamined by Transport Canada with the following objectives:</p> <ul style="list-style-type: none"> <li>(a) To establish a staffing standard based on realistic and measurable task performance and frequencies and accepted standards of time required for such tasks.</li> <li>(b) To ensure that within the Resource Management Board and its secretariat there is an individual with aviation operational expertise who is cognizant of safety implications in resource reduction programs.</li> <li>(c) To ensure that members of the Resource Management Board understand the implications of personnel reductions below the minimum level prescribed by accepted staffing standards.</li> <li>(d) To ensure that the deputy minister of transport be informed of each</li> </ul>	<p>A complete air carrier industry status and regulatory workload indicator reporting system be developed as a special project by experienced operations managers and information system specialists. The objective of this system is to provide industry regulatory status and workload information of value to Transport Canada managers at all levels with respect to the need for an accomplishment of certification and inspection activities. It should incorporate indicators and general inspector knowledge concerning an individual air carrier's and the industry regulatory health and shortcomings that may affect air carrier safety.</p> <p><b>Status: Under Way.</b></p> <p>MCRs 114, 124</p> <p>The quality of the Aviation Regulation Directorate's staffing standards, the changes that have been made to the resource allocation process, the reallocation of tasks between Inspectors and their supporting staff, and the existence of a contingency factor in the resource reallocation system combine to fulfil the requirements of MCRs 114 and 124.</p> <p><b>Status: Implemented. (MCRs 114, 124)</b></p>

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Recommendations	Implementation Measures
<p>instance in which the Resource Management Board or its secretariat returns plans to Transport Canada group heads asking for further justification of resource requirements for aviation safety-related items.</p> <p>MCR 125</p> <p>Transport Canada examine the role of the Resource Management Board, formerly the Program Control Board, with a view to attaining the following goals:</p> <ul style="list-style-type: none"> <li>(a) To ensure that the deputy minister of transport will be informed of all aviation safety implications of any resource reductions or denials recommended by the Resource Management Board.</li> <li>(b) To ensure that within the Resource Management Board and its secretariat there is an individual with aviation operational expertise who is cognizant of safety implications in resource reduction programs.</li> <li>(c) To ensure that members of the Resource Management Board understand the implications of personnel reductions below the minimum level prescribed by accepted staffing standards.</li> <li>(d) To ensure that the deputy minister of transport be informed of each instance in which the Resource Management Board or its secretariat returns plans to Transport Canada group heads asking for further justification of resource requirements for aviation safety-related items.</li> </ul>	<p>MCR 125</p> <p>It was determined that the intent of this recommendation has been met through the elimination of the Resource Management Board and the review of resource proposals by Transport Canada's Senior Management Executive.</p> <p><b>Status: Implemented.</b></p>

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Recommendations	Implementation Measures
<p>MCR 126</p> <p>Transport Canada's Aviation Regulation Directorate develop a system that focuses resources on the areas of highest risk.</p>	<p>MCR 126</p> <p>It was determined that given the risk management initiatives implemented or ongoing within Aviation Regulation and broadly within Transport Canada Aviation, this recommendation is considered implemented.</p> <p><b>Status: Implemented.</b></p>
<p>MCR 127</p> <p>Transport Canada review and revise its aviation audit policy, under the direction and approval of the assistant deputy minister, aviation.</p>	<p>For MCR 127 See MCR 138</p>
<p>MCR 128</p> <p>Transport Canada ensure that the rationale for and the importance of the audit program be clearly enunciated to all participating departmental staff and to the aviation industry.</p>	<p>MCR 128</p> <p>The Manual of Regulatory Audits and the attendant training program emphasize to all departmental staff the importance of the audit program. Transport Canada also has extended this training program to industry representatives.</p> <p><b>Status: Implemented.</b></p>
<p>MCR 129</p> <p>Transport Canada ensure that the frequency of audits be based upon a formula that takes into consideration all significant factors, including</p>	<p>For MCR 129 See MCR 138</p>

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Recommendations	Implementation Measures
<p>safety and conformance records, changes in type of operations, mergers, introduction of new equipment, and changes in key personnel.</p> <p>MCR 130</p> <p>Transport Canada policy confirm that joint air carrier airworthiness and operations audits are the accepted norm, particularly for large companies; however, other types of audits should be identified and flexibility provided to facilitate no-notice mini-audits or inspections, split airworthiness and operations audits where warranted, and audits of specific areas of urgent concern arising from safety issues that are identified from time to time.</p> <p>MCR 131</p> <p>Transport Canada ensure the availability of qualified managers to manage and coordinate the audit programs.</p> <p>MCR 132</p> <p>Transport Canada ensure the availability of adequate and qualified personnel to support the audit program.</p>	<p>For MCR 130 See MCR 138</p> <p>MCR 131</p> <p>The new audit procedures contained in the Manual of Regulatory Audits and existing in management practices have built-in safeguards against unqualified personnel managing or participating in audits.</p> <p><b>Status: Implemented.</b></p> <p>MCR 132</p> <p>The new audit procedures contained in the Manual of Regulatory Audits and existing in management practices have built-in safeguards against unqualified personnel managing or participating in audits.</p> <p><b>Status: Implemented.</b></p>

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Recommendations	Implementation Measures
<p>MCR 133</p> <p>Transport Canada ensure that minimum training and competency requirements be established for specific positions in the audit process.</p>	<p>MCR 133</p> <p>The Manual of Regulatory Audits specifies the minimum training and competency requirements for all individuals involved in the audit process.</p> <p><b>Status: Implemented.</b></p>
<p>MCR 134</p> <p>Transport Canada ensure that personnel appointed to an audit have a direct reporting relationship to the audit manager from commencement until completion of the audit and the approval of the final report for that audit.</p>	<p>For MCR 134 See MCR 138</p>
<p>MCR 135</p> <p>Transport Canada reinforce existing policy that requires audit managers to be readily available to audit staff during the conduct of an audit.</p>	<p>For MCR 135 See MCR 138</p>
<p>MCR 136</p> <p>Transport Canada policy manuals provide that an air carrier document review process, including a review of prior audits, be completed prior to the commencement of an audit.</p>	<p>For MCR 136 See MCR 138</p>

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Recommendations	Implementation Measures
<p>MCR 137</p> <p>Transport Canada ensure that time limitations be clearly specified and adhered to within which completion and delivery of audit reports are to be achieved.</p> <p>MCR 138</p> <p>Transport Canada ensure that procedures for immediate response to critical safety issues identified during an audit be instituted and included in the appropriate Transport Canada manuals, and that such procedures be communicated to the Canadian aviation industry.</p>	<p>MCR 137</p> <p>The Manual of Regulatory Audits specifies time limitations for the audit report to be completed.</p> <p><b>Status: Implemented.</b></p> <p>MCRs 127, 129, 130, 134, 135, 136, 138</p> <ul style="list-style-type: none"> <li>• Transport Canada Aviation Regulation reassert its overall audit policy within the Manual of Regulatory Audits (MRA). That policy should include the recreation of a National Audit Program (NAP) approved annually by the Assistant Deputy Minister, Aviation and the National Aviation Management Executive. It should also include a parallel regional combined audit program. (MRA Chapter One, Section Two). (MCR 127).</li> <li>• Establish a small Headquarters group under the Director General, Aviation Regulation to plan, organize and administer the NAP.</li> <li>• The use of oral Observations should be restored to audit practice. (MCR 127)</li> <li>• Redefine the frequency of audits to require the audit of an air carrier within a time interval of zero to three years, with an extension to as much as five years for carriers which meet particular conditions of a proven record of compliance, a successful internal audit program and a track record of sound company check pilot and other quality assurance programs. In all cases the actual frequency of audit</li> </ul>

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Recommendations	Implementation Measures
	<p>within the above time envelope will be determined by the judgement of regional regulatory managers using the risk indications applicable to each situation. (MRA Chapter One, Section Two, 2.7). (MCR 129).</p> <ul style="list-style-type: none"> <li>• Eliminate the use of a numerical rating system such as the Audit Information Reporting System (AIRS). Replace it in the audit selection process with further training and application of regulatory judgement about carriers based on experience and risk indicators. (MCR 129).</li> <li>• Re-institute combined airworthiness and air carrier Routine Conformance Monitoring Audits for air carriers included in the NAP and other larger local carriers as determined by regions. The other three classes of audits should continue as: Initial Certification, Additional Authority, and Special Purpose Audits. Use of these classes of audits should be established, the first two by stated policy; the last as determined by the appropriate convening authority. The MRA must be amended to reflect consistency with the policy of combined audits. (MRA Chapter One, Section Two, 2.3; Chapter Two, Section Two, 2.2 &amp; 2.5 Chapter Three, Section One, 1.2). (MCR 130).</li> <li>• Re-introduce audits designed especially for small companies. (MCR 130).</li> <li>• Ensure that national regulatory management, the audit convening authority and audit managers rigorously operate by the requirements of the MRA with respect to the direct assignment of staff to the audit team. (MRA Chapter One, Section Two, 2.9 Unity of Control).</li> </ul>

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Recommendations	Implementation Measures
<p>MCR 139</p> <p>Transport Canada ensure that trend analyses be produced from the results of audits and used in the formulation of decisions regarding the type, subject, and frequency of audits.</p>	<p>(MCR 134).</p> <ul style="list-style-type: none"> <li>• Ensure that the MRA articulates the need for the audit manager to be readily available for all leadership, consultation and reference activities during an audit. (MRA Chapter One, Section Five, 5.1 Audit Manager Terms of Reference &amp; Responsibilities). (MCR 135).</li> <li>• The recommendation to include a document review is already contained in the current MRA (MRA Chapter One, Section Four, 4.3 Pre-Audit Activities - Documentation and File Review). (MCR 136).</li> <li>• Include in the MRA audit procedures a special statement and description section explaining the actions for an audit team to take if safety related non-conformances are discovered in the course of the audit which must be corrected immediately and expanding upon the need for immediate corrective action in the company response section. (MRA Chapter One, Section Three, 4.10 Audit Follow-up). (MCR 138).</li> </ul> <p><b>Status: Implemented.</b> (MCRs 127, 129, 130, 134, 135, 136, 138)</p> <p>MCR 139</p> <p>The Manual of Regulatory Audits specifies the use of trend analysis as a criteria to determine the type, subject and frequency of audits.</p> <p><b>Status: Implemented.</b></p>

### Part III: Implementation Measures

Recommendations	Implementation Measures
<p><b>MCR 140</b></p> <p>Transport Canada ensure that managers and inspectors responsible for the application of operating rules are consulted on proposed changes to such rules.</p> <p><b>MCR 141</b></p> <p>If the proposed draft operating rules currently being developed by Transport Canada do not fully address and satisfy the concerns identified by this Inquiry and expressed herein, then the entire matter of air carrier operating rules be reconsidered by Transport Canada with a view to adopting the United States Federal Aviation Regulation operating rules applying to air carriers for the Canadian regulatory scheme, amended or supplemented as necessary to accommodate Canadian conditions and purposes, on the highest possible priority basis.</p> <p><b>MCR 142</b></p> <p>In the event that the United States Federal Aviation Regulation (FAR) operating rules are adopted by Transport Canada for a required Canadian regulatory scheme, Transport Canada retain an expert in the application of the FARs to assist in their transition into the Canadian regulatory regime.</p>	<p><b>MCR 140</b></p> <p>It is currently Transport Canada policy and practice that managers and inspectors responsible for the application of operating rules are fully consulted on proposed changes to such rules.</p> <p><b>Status: Implemented.</b></p> <p>For MCR 141 See MCR 143</p> <p><b>MCR 142</b></p> <p>With the establishment of the Regulatory Renewal Project and the International Harmonization Project, this recommendation be considered as implemented.</p> <p><b>Status: Implemented.</b></p>

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Recommendations	Implementation Measures
<p>MCR 143</p> <p>In the event of adoption of the United States Federal Aviation Regulation operating rules for a revised Canadian regulatory scheme, all the recommendations contained in this Final Report and in my Interim Reports proposing amendments or changes to existing Air Navigation Orders and Regulations be incorporated accordingly in order to give full meaning and effect to the subject matter under consideration.</p> <p>MCR 144</p> <p>Transport Canada monitor the efforts of the United States Federal Aviation Administration and the European Joint Aviation Authorities to achieve greater commonality in aircraft design and certification requirements and in operating regulations, with a view to achieving harmonization of Canadian airworthiness and operating rules with the changing international aviation environment.</p> <p>MCR 145</p> <p>Transport Canada adopt the recommendations contained in sections 5.2 and 5.3 of the May 1990 evaluation of Aviation Regulation and Safety Programs, regarding priority setting for regulatory developments and the rule-making process.</p>	<p>MCRs 141, 143</p> <p>MCR 141 and MCR 143 be implemented by "fast-tracking" Series VI and Series VII of the revised <i>Air Regulations</i> as supplemented by appropriate Commission recommendations having regulatory implications. Harmonization initiatives will follow in the longer term after a new regulatory infrastructure for air carriers is put in place.</p> <p><b>Status: Implemented. (MCRs 141, 143)</b></p> <p>MCR 144</p> <p>Transport Canada continue in its present efforts to achieve commonality in airworthiness and operational rules with, first, the United States and, second, the European Economic Community. The Commission's recommendation is being exceeded and has already been implemented through the on-going consultations of the Airworthiness Branch, the Air Carrier Branch, and the International Harmonization of Regulations Project, who should continue their efforts to achieve commonality.</p> <p><b>Status: Implemented.</b></p> <p>For MCR 145 See MCR 146</p>

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Recommendations	Implementation Measures
<p>MCR 146</p> <p>A senior member of the Privy Council staff be included in the proposed senior departmental review committee for priority setting.</p> <p>MCR 147</p> <p>Transport Canada pursue a program that would lead to further delegation of authority to company check pilots with air carriers that have demonstrated an exemplary safety record and have in place mature programs for training and checking pilots. To such carriers, delegation of authority with respect to initial pilot proficiency checks and pilot upgrades should be considered as well.</p> <p>MCR 148</p> <p>Transport Canada provide a comprehensive monitoring program of both designated company check pilots and a representative cross-section of each company's pilots to ensure that standards are being properly applied and maintained.</p>	<p>MCRs 145, 146</p> <p>Transport Canada has established a senior aviation management committee to establish regulatory priorities. In addition, a dedicated Privy Council Office (Justice) Satellite team has been established to review and approve aviation safety regulations under the <i>Statutory Instruments Act</i>.</p> <p><b>Status: Implemented. (MCRs 145, 146)</b></p> <p>For MCR 147 See MCR 156</p> <p>For MCR 148 See MCR 156</p>

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Recommendations	Implementation Measures
<p>MCR 149</p> <p>Transport Canada conduct, and reserve the right to conduct, pilot proficiency spot checks on all air carrier pilots, including designated company check pilots, as it sees fit and without notice.</p>	<p>For MCR 149 See MCR 156</p>
<p>MCR 150</p> <p>Transport Canada conduct initial pilot proficiency checks and line checks with every air carrier in cases where a new aircraft type is being introduced, to ensure that the required standards are met in that air carrier's operation of the new aircraft type.</p>	<p>For MCR 150 See MCR 156</p>
<p>MCR 151</p> <p>Transport Canada ensure that all pilot proficiency checks on aircraft over 12,500 pounds and on all turbojet aircraft be conducted only by air carrier inspectors or company check pilots holding a current rating for the specific aircraft type on which the check is being conducted.</p>	<p>MCR 151</p> <p>It is currently Transport Canada's practice to assign only inspectors qualified on type to conduct pilot proficiency checks on all turbojet aircraft and aircraft over 12,500 pounds.</p> <p><b>Status: Implemented.</b></p>
<p>MCR 152</p> <p>Transport Canada ensure that pilot proficiency checks on non-turbojet aircraft and on aircraft under 12,500 pounds be conducted only by air carrier inspectors or company check pilots who are type-rated on that aircraft type or on a generically similar aircraft.</p>	<p>MCR 152</p> <p>This is current Transport Canada policy and practice.</p> <p><b>Status: Implemented.</b></p>

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### Part III: Implementation Measures

Recommendations	Implementation Measures
<p>(a) to provide a clear and unambiguous definition of what is meant by the term "conflict of interest" as it relates to company check pilots;</p> <p>(b) to specify those areas in which a conflict of interest can arise, in addition to the area of financial interest.</p> <p>MCR 155</p> <p>Transport Canada provide explicit guidelines to its air carrier inspectors on the subject of conflict of interest for use in evaluating individual candidates for the position of company check pilot.</p> <p>MCR 156</p> <p>Transport Canada conduct an evaluation of potential conflict of interest with respect to each company check pilot candidate, and that a written record be kept of each such evaluation.</p>	<p>For MCR 155 See MCR 156</p> <p>MCRs 147, 148, 149, 150, 154, 155, 156</p> <ul style="list-style-type: none"> <li>• Further delegation of company check pilot authority be given to qualifying air carriers to conduct initial and upgrade checks, initial pilot proficiency checks, initial instrument rating tests and some category endorsements. The companies open to such delegation should have in place a mature program for training and checking pilots and minimal occurrence of the pertinent audit or inspection risk factors. (MCR 147) (see also MCR 113).</li> <li>• Transport Canada continue to monitor the performance of company check pilots against the current twelve-month frequency criteria of the Company Check Pilot Manual. In the case of delegation of initial checks, inspectors must carry out a determined number of these checks in accordance with policy. (MCR 148).</li> </ul>

### Part III: Implementation Measures

Recommendations	Implementation Measures
	<ul style="list-style-type: none"> <li>• The Air Carrier Inspector Manual, Chapter 1, General Policy be amended to state that Transport Canada reserves the right to conduct any inspection as provided by the <i>Air Regulations</i>. (MCR 149).</li> <li>• Transport Canada amend the Air Carrier Inspector Manual to provide guidelines on the processes to monitor companies introducing new levels of service. The guidelines should include an explanation of the need for special monitoring, when a new aircraft service is considered mature; the transition to a company check pilot program for the new service; and other related issues. (MCR 150).</li> <li>• Transport Canada establish a project to evaluate the implementation of a free balance CCP program.</li> <li>• Policy, procedures and guidelines be provided in the TC Company Check Pilot Manual on company check pilot conflict of interest:             <ul style="list-style-type: none"> <li>- on the nature of conflict of interest for company check pilots (including certain levels of financial interest, direct involvement in company ownership, a substantial number of voting shares, family ties, any privileges or favours which could bias the CCPs ability to conduct his or her duties);</li> <li>- on the requirement for the company to investigate the candidate's background, character and motives and to declare all conflict of interest;</li> <li>- the need for companies and check pilot candidates to declare initially, and review regularly in conjunction with the monitoring program any change in conflict of interest;</li> </ul> </li> </ul>

### Part III: Implementation Measures

Recommendations	Implementation Measures
	<ul style="list-style-type: none"> <li>- to provide Transport Canada air carrier regulatory management and inspectors guidance on what may constitute conflict of interest;</li> <li>- to give authority to regional air carrier operations management to determine if the declared conflict is acceptable in each CCP appointment or appointment review;</li> <li>- to address conflict of interest in relation to supervisory pilots and draw attention to it in the nomination forms by referring to the TC CPM, Section 5-1, Air Carrier Check Pilots - Limits of Authority;</li> <li>- to ensure that the nominating carrier understands that any coercion or effort by them to influence or obstruct the CCP in any way in the course of fulfilling his or her obligations to the Minister will result in the forfeiture of CCP authority and the revocation of the validity of any checks performed by the errant CCP;</li> <li>- to outline further the consequences of breaching conflict of interest requirements;</li> <li>- for a record keeping process covering conflict of interest reviews and decisions by the company, the CCP and Transport Canada. (MCRs 154, 155, 156);</li> <li>- to train and review the factors surrounding conflict of interest on CCP courses and workshops, and on Transport Canada air carrier inspector training programs;</li> <li>- on assessing for the existence of meaningful conflict of interest</li> </ul>

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Recommendations	Implementation Measures
<p>MCR 157</p> <p>Transport Canada provide appropriate regulations governing the practice whereby air carriers enter into contracts with other companies or agencies for the provision of facilities or services required under the terms of the air carrier's operating certificate.</p> <p>MCR 158</p> <p>Transport Canada inspectors be provided clear and direct guidance governing their aviation-regulation responsibilities for approval of arrangements and facilities to be contracted out to other companies or agencies by Canadian air carriers.</p>	<p>during CCP monitor checks and during company audits.</p> <p><b>Status: Under Way.</b> (MCRs 147, 148, 140, 150, 154, 155, 156)</p> <p>MCR 157</p> <p>The Transport Canada Airworthiness Manual, published January 1, 1991, includes regulations noted in this recommendation.</p> <p><b>Status: Implemented.</b></p> <p>MCR 158</p> <p>The Airworthiness Manual provides the necessary guidance pertaining to the approval of both company and contracted maintenance facilities and services.</p> <p>Existing regulations provide guidance governing the approval by Transport Canada of such things as pilot training programs, de-icing facilities and training.</p> <p><b>Status: Implemented.</b></p>

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Recommendations	Implementation Measures
<p>MCR 159</p> <p>Transport Canada set out a clear and unequivocal policy for senior managers specifying the basis upon which a waiver application is to be considered, ensuring that all safety implications are fully considered and satisfied before such waiver is granted.</p> <p>MCR 160</p> <p>Transport Canada take steps to increase substantially the number of no-notice inspections of air carriers, with particular emphasis on safety-sensitive or high-risk areas.</p>	<p>MCR 159</p> <p>A strengthened directive on the subject of "Exemptions from Regulatory Requirements" developed and approved through the Dryden Commission Implementation Project be issued by the Director General, Aviation Regulation.</p> <p><b>Status: Implemented.</b></p> <p>MCR 160</p> <ul style="list-style-type: none"> <li>• No-notice inspections and surveillance operations be used as applicable, the need determined by regional regulatory management.</li> <li>• Sufficient inspector resources be provided to the regions to conduct no-notice inspections and surveillance operations by specifying a defined reserve of inspector activity time unique to each region as a specific person-year availability. Guidelines as to inspection activity priorities should be provided by Headquarters to enable regional managers to have a standard for stating displacement or postponement of non-discretionary or scheduled activities for actions with a higher safety need.</li> <li>• The Air Carrier Inspector Manual and the Airworthiness Staff Instructions include guidelines for no-notice inspections which include explanation of the need, the priority, indicators (similar to the risk indicators in Chapter One, Section 2.7 of the MRA), and other related policy matters.</li> </ul> <p><b>Status: Under Way. (See also MCR 111)</b></p>

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Recommendations	Implementation Measures
<p><b>MCR 161</b></p> <p>Transport Canada proffer for enactment an amendment to the <i>Aeronautics Act</i> to delineate clearly the minister's responsibility for aviation safety. Such amendment should emphasize the minister's responsibility to ensure that the department is organized in a manner to keep the minister accurately informed of the ability of Transport Canada to deliver its mandated aviation safety programs effectively.</p> <p><b>MCR 162</b></p> <p>Transport Canada be organized in a manner to provide the managerial structure necessary to keep the minister and deputy minister fully and accurately informed of all matters having an impact on aviation safety, and to ensure that appropriate and timely action is taken to address aviation safety concerns.</p>	<p><b>MCR 161</b></p> <p>This matter be raised with the Department of Justice when the Act is next amended. Only that aspect of MCR 161 respecting the Minister's overall responsibility for aviation safety is considered acceptable, however. The organization of the department to ensure that this responsibility is met is not considered appropriate for inclusion in the statute but is best addressed administratively by the Deputy Minister and senior management.</p> <p><b>Status: Under Way.</b></p> <p><b>MCR 162</b></p> <p>Transport Canada's organization and procedures have been restructured so as to keep senior officials, including the Minister and Deputy Minister fully and accurately informed on aviation safety matters.</p> <p><b>Status: Implemented.</b></p>

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Recommendations	Implementation Measures
<p><b>MCR 163</b></p> <p>Transport Canada state clearly the goals that aviation safety-related programs are expected to achieve, and that it identify the extent of inspection, surveillance, and enforcement activities that must be conducted within a given time frame. Such program goals should be designed in consultation with the Aviation Group's operationally and technically qualified staff.</p>	<p><b>MCR 163</b></p> <ul style="list-style-type: none"> <li>• Transport Canada develop, promulgate, apply, report and take management safety-related action on a clear set of performance goals for the regulatory activities of inspection, audit, surveillance and compliance. These must be developed in consultation with regional inspection staff.</li> <li>• The goals must be available in a single document for communication, performance and reference purposes, and updated routinely. Using the present Departmental standards documents, the Transport Canada Aviation Management Guide must be developed to include these essential performance standards as quickly as possible.</li> </ul> <p><b>Status: Under Way.</b></p>
<p><b>MCR 164</b></p> <p>Transport Canada create a single position in each region (e.g., a director-general) responsible and accountable for the delivery of the aviation programs assigned to the present Airports Authority Group and the Aviation Group. This position should report directly to a senior administrator or assistant deputy minister at headquarters, who is responsible for the overall delivery of such aviation programs on a national basis.</p>	<p><b>MCR 164</b></p> <p>As the intent of MCR 164 has been met, it was determined that this recommendation be considered implemented and the question of merging the Aviation and Airports Groups be addressed when their long-term relationship to Transport Canada becomes clear and stable.</p> <p><b>Status: Implemented.</b></p>

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Recommendations	Implementation Measures
<p><b>MCR 165</b></p> <p>The regional directors-general (proposed in MCR 164 above) be authorized to manage their resources in a responsible and flexible manner. Such authority should be accompanied by firm insistence on accountability and a monitoring activity that will ensure responsible management.</p>	<p><b>MCR 165</b></p> <p>The Aviation Regional Directors General have been authorized to manage their resources in a responsible and flexible manner and are directly accountable to the Assistant Deputy Minister, Aviation. This management approach will be considered in future Transport Canada Aviation Organizations. MCR 165 is considered fully implemented.</p> <p><b>Status: Implemented.</b></p>
<p><b>MCR 166</b></p> <p>Transport Canada create the position of a headquarters' operational aviation safety officer with an appropriate support staff. This aviation safety officer should report directly to the most senior aviation position in the department and should be responsible for auditing the safety performance of both the Airports Authority Group and the Aviation Group.</p>	<p><b>MCR 166</b></p> <p>Presently, there is a position of Director General, System Safety and staff which reports to the Assistant Deputy Minister, Aviation. The Assistant Deputy Ministers of Aviation and Airports, have an agreement which provides that total safety analysis is accomplished by this position.</p> <p><b>Status: Implemented.</b></p>
<p><b>MCR 167</b></p> <p>Transport Canada actively participate in the research and development necessary to establish safety effectiveness measurement systems that will lead to the most efficient use of resources in assuring safety. Cooperation with the United States Federal Aviation Administration and other international groups should be encouraged and resourced to obtain the maximum and most expedient benefits from such programs.</p>	<p><b>MCR 167</b></p> <ul style="list-style-type: none"> <li>Transport Canada's Aviation Regulation Management Council, which has representation from the System Safety Directorate, incorporate the following initiatives identified by the Workshop on Aviation Safety Effectiveness Measurement Systems into the Aviation Regulation Research &amp; Development Plan:</li> </ul>

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Recommendations	Implementation Measures
	<ul style="list-style-type: none"> <li>a) investigate an efficient, cost-effective means of synthesizing and communicating the large amount of aviation data and information that are available to executives and other decision-makers within air carriers. Information on benefits as well as costs should be included.</li> <li>b) identify the information required by aviation system decision-makers to help them prevent occurrences.</li> </ul> <ul style="list-style-type: none"> <li>• The System Safety Directorate encourage the IDEAS Committee to review the adequacy of currently available data, including whether additional data are needed and the level of detail; evaluate current and possible alternate data analysis methods; and, based on existing data, establish standard indicators for international use.</li> <li>• The System Safety Directorate continue to keep abreast of the safety effectiveness measurement research and development initiatives of other countries and organizations, with particular attention to those areas identified by the workshop, in order to identify suitable opportunities to participate.</li> <li>• Transport Canada make a more concerted effort to assess current good practices in other industries through initiatives such as investigating the International Standards Organization (ISO) and the Canadian Standards Association (CSA).</li> </ul> <p><b>Status: Implemented.</b></p>

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Recommendations	Implementation Measures
<p>MCR 168</p> <p>Transport Canada aviation safety committees, with access directly to the headquarters' operational aviation safety officer, be established in regions and headquarters.</p>	<p>MCR 168</p> <p>Existing Regional and Headquarters safety committees be reaffirmed and strengthened to satisfy this MCR.</p> <p>To this end it is proposed that Transport Canada adopt the Regional Safety Committee and HQ Aviation Safety Review Committee draft Terms of Reference developed by the DCIP with the following amendments:</p> <ol style="list-style-type: none"> <li>1. The Aviation Safety Review Committee, when reviewing safety issues, should decide on appropriate preventive action and direct this to the OPI;</li> <li>2. Minutes of the Aviation Safety Review Committee be distributed to all Regional Directors General Aviation;</li> <li>3. A Transport Canada review process, under the direction of the Director General System Safety, be established to ensure compliance with the Terms of Reference for both committees.</li> </ol> <p><b>Status: Implemented.</b></p>
<p>MCR 169</p> <p>Transport Canada establish a mandatory education program to ensure that senior managers and officials of the department who are responsible for or associated with aviation programs are aware of the basis for and requirement to support policies that affect aviation safety.</p>	<p>MCR 169</p> <p>The System Safety Directorate of Transport Canada, Aviation be directed to develop a mandatory education program to ensure that senior managers and officials of the department who are responsible for or associated with aviation programs can be made aware of the basis for and the requirement to support policies that affect safety.</p>

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Recommendations	Implementation Measures
<p>MCR 170</p> <p>Transport Canada address the anomaly existing in Air Navigation Order Series VII, No. 2, with respect to the lack of maximum flight times and maximum flight duty times prescribed for cabin crew members.</p> <p>MCR 171</p> <p>Transport Canada implement regulations requiring air carriers to provide approved crew resource management training and standard operating procedures for all Canadian air carrier flight crews and cabin crews. This training should be designed to coordinate the flight activities and information exchange of the entire air crew team, including the following particulars:</p> <p>(a) As part of such crew resource management training, joint training</p>	<p>Mandatory risk management training for senior management be adopted as policy and incorporated into the Transport Canada Aviation Management Guide.</p> <p><b>Status: Under Way.</b></p> <p>MCR 170</p> <ul style="list-style-type: none"> <li>◦ the Canadian Aviation Regulations require maximum flight times and maximum flight duty times for Flight Attendants;</li> <li>◦ a Canadian Aviation Regulations Advisory Council (CARAC) Technical Committee draft the proposed regulation;</li> <li>◦ the Cabin Safety Task Group's files and Decision Records regarding this MCR be made available to the CARAC Technical Committee for use in their drafting of the proposed regulation.</li> </ul> <p><b>Status: Under Way.</b></p> <p>MCR 171</p> <ul style="list-style-type: none"> <li>◦ the requirement for initial Crew Resource Management Training approved by Transport Canada for pilots and flight attendants be incorporated into the Canadian Aviation Regulations;</li> <li>◦ the requirement for annual flight attendant and pilot joint training be incorporated into the Canadian Aviation Regulations, and include: <ul style="list-style-type: none"> <li>- review of air carrier accidents and incidents,</li> <li>- crew member evacuation drills,</li> </ul> </li> </ul>

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Recommendations	Implementation Measures
<p>should be carried out involving all captains and in-charge cabin crew members in order that each fully understand the duties and responsibilities of the other.</p> <p>(b) All cabin crew members should be given sufficient training to enable them to recognize potentially unsafe situations both in the cabin and outside the aircraft. If it is necessary to prioritize such training, it should first be provided to all in-charge cabin attendants.</p> <p>(c) As part of normal pre-flight announcements over the aircraft public address system, passengers should be advised that they may draw any concerns to the attention of the cabin crew members.</p> <p>(d) All cabin crew members should be trained and instructed to communicate all on-board safety concerns they may have or that may be communicated to them by any passenger to the captain through the in-charge cabin crew member, unless time or other circumstances do not permit following this chain of command.</p> <p>(e) All in-charge cabin crew members, after appropriate training, should be encouraged in adverse winter weather conditions to monitor the condition of the surface of the aircraft wings as part of the pre-takeoff cabin routine, in order to check for contamination, as a supplement to the captain's primary responsibility in that regard.</p> <p>(f) Pilots should be made aware that concerns raised by cabin crew members should be taken seriously and investigated, where appropriate.</p> <p>(g) Pilots should be instructed that when travelling as passengers on</p>	<ul style="list-style-type: none"> <li>- the practice and reinforcement of crew resource management;</li> <li>o the following be used as a basis to develop a Crew Resource Management Training Standard to be incorporated by reference into the Canadian Aviation Regulations: <ul style="list-style-type: none"> <li>- Reasoning and Problem Solving,</li> <li>- Human Errors,</li> <li>- Team Formation and Maintenance,</li> <li>- Communication,</li> <li>- Decision Making,</li> <li>- Attention Management;</li> </ul> </li> <li>o the document developed through the Dryden Commission Implementation Project and entitled "The Elite Crew: Safety Enhancement Training Manual" be published as an advisory guidance document.</li> </ul> <p><b>Status: Under Way.</b></p>

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Recommendations	Implementation Measures
<p>board an aircraft they should never assume that the operating crew is aware of any situation that they themselves perceive to be a safety concern. Such pilot passengers should be encouraged to raise such concerns with a cabin crew member and request that the information be given to the captain</p> <p>MCR 172</p> <p>In order to dispel any possible notion of "professional courtesy" or "respect" precluding the communication of any dangerous situation, specifically addressing the case of off-duty airline pilots, all Canadian air carriers and the Canadian Air Line Pilots Association provide to each of their pilots a clear statement disavowing any notion that professional courtesy or respect precludes an off-duty airline pilot on board an aircraft as a passenger from drawing a perceived safety concern to the attention of the captain. The statement should indicate that, while it is not mandatory for them to do so, it is appropriate for off-duty pilots who are on board an aircraft as passengers to communicate to the captain, through the intervention of a cabin crew member, any safety-related concerns perceived on board the aircraft.</p>	<p>MCR 172</p> <ul style="list-style-type: none"> <li>The Air Transport Association of Canada recommend to its member air carriers that they issue a statement to their pilots that includes at least the following information: <p>"The Commission of Inquiry into the Air Ontario Crash at Dryden, Ontario, made a recommendation concerning "professional courtesy" or "respect", which is the assumption that a fellow professional will always act responsibly. The concept of professional courtesy or respect should not prevent pilots travelling as passengers from bringing safety-related concerns to the attention of cabin crew for communication to the pilot".</p> </li> <li>The Canadian Air Line Pilots Association issue a letter to its member pilots containing at least the information to be included in the above-proposed statement by the Air Transport Association of Canada;</li> <li>In order to reach as many Canadian pilots as possible, Transport Canada publish a statement in its Aviation Safety Letter that contains at least the information to be included in the above-proposed statements by the Air Transport Association of Canada and</li> </ul>

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Recommendations	Implementation Measures
<p>MCR 173</p> <p>The captain of an aircraft operating in adverse winter weather conditions be required formally to advise the in-charge cabin crew member, prior to departure from the gate, whether ground de-icing of the aircraft is to take place and, in order to eliminate potential apprehension on the part of passengers, that they be advised accordingly on the public address system of the aircraft.</p>	<p>the Canadian Air Line Pilots Association;</p> <ul style="list-style-type: none"> <li>• The <i>Aeronautical Information Publication</i> be amended to incorporate a statement that, as a minimum, contains the same information as the statements in the foregoing proposals.</li> </ul> <p><b>Status: Under Way.</b></p> <p>MCR 173</p> <ul style="list-style-type: none"> <li>• The Canadian Aviation Regulations require the pilot-in-command to inform the cabin crew and passengers of the decision to have the aircraft de-iced/anti-iced when the decision has been made.</li> <li>• The flight crew be encouraged, through an Air Carrier Advisory Circular, to keep the cabin crew and passengers informed of all decisions regarding de-icing/anti-icing, workload permitting.</li> <li>• The Commercial Air Services Standards state that how the information is to be conveyed to the passengers be left to the pilot-in-command's discretion.</li> <li>• The guidance material accompanying the Commercial Air Services Standards state that if the aircraft has been de-iced/anti-iced prior to the boarding of passengers, no announcement to that effect is required.</li> </ul>

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Recommendations	Implementation Measures
<p>MCR 174</p> <p>Transport Canada implement a regulation requiring that, at any time prior to commencement of the takeoff roll, in the absence of prior advice by the captain that ground de-icing of the aircraft in adverse winter weather conditions is to be conducted, the in-charge cabin crew member be required to report to the captain his or her own concerns, or any concerns conveyed to him or to her by any cabin crew member or any passenger on board the aircraft, relating to wing contamination.</p>	<ul style="list-style-type: none"> <li>• The Transport Canada de-icing/anti-icing training package be revised to incorporate the above requirements.</li> </ul> <p><b>Status: Under Way.</b></p>
<p>MCR 175</p> <p>The Transportation Safety Board of Canada further develop its investigation procedures into human factors aspects of aviation accidents to include a comprehensive section addressing the role of air carrier management in the area of flight safety management; and that the board encourage examination of management failures in a causal sense as part of its accident investigation procedures.</p>	<p>MCR 174</p> <ul style="list-style-type: none"> <li>◦ the Flight Attendant Manual Standard be amended to require flight attendants to report to the pilot-in-command, at any time prior to the commencement of the take-off roll, the observation of wing contamination by a passenger.</li> </ul> <p><b>Status: Implemented.</b></p>
<p>MCR 176</p> <p>In conjunction with MCR 175 above, that the Transportation Safety Board of Canada actively pursue the amendment of appropriate International Civil Aviation Organization documents to address in a</p>	<p>For MCR 175 See MCR 188</p> <p>MCR 176</p> <p>Both TSB and ICAO have taken action in line with this recommendation. Following agreement at ICAO's Accident Investigation Group, amendments are now being made to ICAO's Manual of Aircraft Accident</p>

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Recommendations	Implementation Measures
<p>similar manner the role of air carrier management in the area of flight safety management.</p> <p>MCR 177</p> <p>The <i>Canadian Transportation Accident Investigation and Safety Board Act</i> be amended and regulations be passed to provide that, at any major aircraft accident investigation, parties having a direct interest in the investigation have the right to nominate, in consultation with the investigator in charge, individuals with specific expertise from among their ranks to be involved in the investigation as participants (as opposed to observers) on specific investigation team groups, such as operations, human factors, records, systems, engines, or site survey.</p> <p>The terms and conditions of such participant involvement should be determined by the Transportation Safety Board of Canada and ought to include provisions placing participants under the authority of and responsible to the investigator in charge, as well as provisions to ensure the absolute confidentiality of all information and documentation gathered relating to the investigation.</p>	<p>Investigation to ensure states look more deeply into organizational and management factors and include pertinent organizational and management information in their Final Reports following aviation accidents.</p> <p><b>Status: Implemented.</b></p> <p>MCR 177</p> <p>The benefits of increased participation in terms of improving the quality and efficiency of investigations is recognized. Arrangements for participation in accident investigations of those interested in the accident from various perspectives have been and are currently of worldwide interest. They have been the subject of recent discussions at ICAO and likely will be given in-depth consideration and discussion involving TSB at the International Maritime Organization (IMO) as IMO reviews marine accident investigation arrangements.</p> <p>Some combination of increased use of experts and increased access by those interested will do much to achieve the desired result. Decisions for increased participation by those interested must take into account the need to ensure objective, conflict-free independent investigations and findings. When the participation of those with a specific interest in the outcome of investigations is too great, the credibility and objectivity of the investigation can be damaged.</p> <p><b>Status: Under Way.</b></p>

### Part III: Implementation Measures

Recommendations	Implementation Measures
<p>MCR 178</p> <p>Sections 28, 29, and 30 of the <i>Canadian Transportation Accident Investigation and Safety Board (CTAISB) Act</i> be amended to provide that witness statements, on-board recordings, and communications records referred to in those sections be made available on a confidential basis to those individuals who have been granted full participant status as representatives of parties having a direct interest in the accident investigation; and that all other provisions of sections 28, 29, and 30 of the <i>(CTAISB) Act</i> be amended accordingly in order to give full meaning and effect to the recommended amendments.</p> <p>MCR 179</p> <p>Section 24(2) of the <i>Canadian Transportation Accident Investigation and Safety Board (CTAISB) Act</i> be repealed. The Transportation Safety Board of Canada, in order to preserve its independence, should not be required to send a copy of any draft report on its findings and safety deficiencies that it has identified to each minister, or to any other person with a direct interest in the findings of the board, to provide them with an opportunity to make representations to the board with respect to the draft report, before the final report is prepared.</p>	<p>MCR 178</p> <p>The objective of the recommendation is understood and the recommendation will be reviewed with those of the <i>CTAISB Act</i> Review Commission addressing the whole area of the appropriate degree of privilege to be attached to certain evidence obtained by TSB in the course of its activities.</p> <p><b>Status: Under Way.</b></p> <p>For MCR 179 See MCR 180</p>

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<p>The other provisions of section 24 of the <i>CTA/ISB Act</i> should be amended accordingly in order to give full meaning and effect to the recommended repeal of section 24(2).</p> <p>MCR 180</p> <p>A section be added to the <i>Canadian Transportation Accident Investigation and Safety Board Act</i> to provide to each minister and to each party having a direct interest in the findings of the board an opportunity, after completion of the aviation occurrence investigation and the gathering of the evidence, to make formal submissions within a time frame to be prescribed by the board, for consideration by the board in its deliberations.</p> <p>MCR 181</p> <p>Section 26 of the <i>Canadian Transportation Accident Investigation and Safety Board Act</i> be amended to incorporate a specific provision entitling a party with a direct interest in an investigation or public inquiry to petition the board for reconsideration of the conclusions of its final report where it is shown that new and material evidence has been discovered subsequent to the conclusion of the investigative process and which might reasonably affect such conclusions or where it is shown that the board's factual conclusions are erroneous.</p>	<p>MCRs 179, 180</p> <p>These recommendations propose an alternative approach for development of TSB reports. The desirability and usefulness of various approaches to obtained input from various persons with a direct interest will be reviewed again; the approach adopted in the <i>CTA/ISB Act</i> was adopted after considerable debate on the advantages and disadvantages of various alternatives but the subject is a difficult one and will be considered again with a view to adopting the most effective possible legislative provision in this area when the <i>ACT</i> is opened for amendment.</p> <p><b>Status: Under Way. (MCRs 179, 180)</b></p> <p>MCR 181</p> <p>The recommendation to include a specific provision in the <i>Act</i> entitling a person with a direct interest to petition the Board for reconsideration of the conclusions in a final Report will be considered. It is to be noted that the <i>Act</i> already enables the Board to reconsider any of its findings and recommendations at any time, and in addition that the present <i>Act</i> requires the Board to reconsider its findings and recommendations where, in the Board's opinion, new material facts appear.</p> <p><b>Status: Under Way.</b></p>

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<p>MCR 182</p> <p>The <i>Canadian Transportation Accident Investigation and Safety Board Act</i> be amended to provide that all witness interviews conducted by investigators in connection with an aviation occurrence shall be tape recorded and transcribed.</p> <p>MCR 183</p> <p>The Transportation Safety Board of Canada add to its roster the names, addresses, and telephone numbers of highly qualified Canadian and international professional experts, learned in the various disciplines, who are willing to be called upon to assist in any given aviation occurrence investigation. Such a roster should be maintained and updated in consultation with the Canadian aviation community.</p>	<p>MCR 182</p> <p>The advantages in the proposal to provide a legislated requirement that all witness interviews be tape recorded and transcribed are recognized. The recommendation will be given full consideration.</p> <p><b>Status: Under Way.</b></p> <p>MCR 183</p> <p>TSB fully recognizes the benefits of taking advantage of expertise in Canada and abroad and will continue to make use of private industry and other expertise to the full extent possible. Building on existing contacts developed by its predecessor agency, the Canadian Aviation Safety Board (CASB), and by the agencies previously responsible for investigation of accidents in modes other than air, TSB has now developed extensive and varied contacts with industry experts in aviation and other modes as well. Thus a growing source of expert information will be available to be called upon in all appropriate circumstances.</p> <p><b>Status: Implemented.</b></p>

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<p>MCR 184</p> <p>The Transportation Safety Board of Canada, as a matter of policy, establish a closer liaison with the National Aeronautical Research Establishment and the National Research Council Canada and, on an ad hoc basis, utilize to the fullest their facilities and staff experts in various applicable disciplines, to assist in the investigation of aviation accidents.</p> <p>MCR 185</p> <p>Sections 24(5) and 24(6) of the <i>Canadian Transportation Accident Investigation and Safety Board (CTAISB) Act</i> be amended to empower the board with the responsibility and authority under law to track and follow up on an ongoing basis the action taken by the minister of transport with respect to each board safety recommendation and, if no action is taken by the minister within a specified time frame, to require an explanation in writing by the minister therefor. There should be a legislated mode of procedure that causes Transport Canada to commit itself to a resolution date, within a specified time frame, with respect to all board recommendations that are accepted by the Minister, with an explanation for the time frame contemplated. In the event that the minister's action varies from the board recommendation, or if the minister proposes to take no action with respect to a recommendation of the board, then written reasons therefor should be provided to the board, and such reasons should be made available to the public.</p> <p>The other provisions of section 24 of the <i>CTAISB Act</i> should be amended accordingly in order to give full meaning and effect to the noted recommended amendments.</p>	<p>MCR 184</p> <p>TSB agrees that access to facilities and staff of such institutions is of great assistance during the investigation process. TSB will continue to foster the close cooperation which exists, particularly with the National Research Council of Canada.</p> <p><b>Status: Implemented.</b></p> <p>MCR 185</p> <p>The Government fully agrees with the objective of the recommendation, that is to ensure an appropriate degree of follow-up to TSB safety recommendation. The proposal for specific legislated requirements in that connection will be fully reviewed. In the meantime, the matter has been given recent attention at TSB where, in response to recommendations of the <i>CTAISB Act</i> Review Commission and in response to this recommendation, the Board has been reviewing how actively it wishes to follow-up on its recommendations and Ministerial response to them. The Board's approach to date has been to try to achieve the degree of activity most consistent with the implementation of its recommendations; that is, the amount and type of encouragement most likely to lead Ministers to acceptance of Board recommendations.</p> <p><b>Status: Under Way.</b></p>

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<p>MCR 186</p> <p>The annual report of the Transportation Safety Board of Canada continue to set out, as it now does, all of the recommendations, whether interim or final, that have been made by the board to the minister in the preceding year, but that it add comment regarding the actions taken by the minister in regard thereto.</p> <p>MCR 187</p> <p>The Transportation Safety Board of Canada provide forensic training to all its scientists and that the board call upon such outside resources as are necessary to assist them with such training.</p>	<p>MCR 186</p> <p>As noted in the response to Recommendation 185, the Board has continuously under review the question of how best to ensure positive Ministerial reaction to these recommendations. The Board has recently reviewed how actively it wishes to follow-up on its recommendations and the Ministerial response to them. As noted above, the approach to date has been to try to achieve the degree of activity most consistent with the implementation of its recommendations; that is, the amount and type of encouragement most likely to lead Ministers to acceptance of Board Recommendation. At present, increased use of the TSB Annual Report and TSB <u>Reflexions</u> magazine is being considered.</p> <p><b>Status: Under Way.</b></p> <p>MCR 187</p> <p>While occasionally TSB staff appear as witnesses in court or coroners proceedings, this is by exception. Subsection 32(2) of the <i>CTAISB Act</i> exists specifically to avoid having TSB investigators devote large amounts of their time to appearing in such proceedings. Some additional training will be considered to assist those who actually do appear, in exceptional circumstances.</p> <p><b>Status: Under Way.</b></p>

### Part III: Implementation Measures

Recommendations	Implementation Measures
<p>MCR 188</p> <p>The Transportation Safety Board of Canada formally adopt a policy recognizing that the investigation of human factors involved in an aviation occurrence is a legitimate pursuit and an important element of the investigatory process.</p>	<p>MCRs 175, 188</p> <p>TSB already recognized the importance of and is committed to investigating fully the human factors elements involved in aviation occurrences. (MCR 175)</p> <p>TSB agrees fully with the importance of giving full consideration to possible human factors aspects of aviation accidents and the agency has devoted considerable attention to developing its capability to investigate human factors aspects of aviation accidents. A human factors unit has been established at the head office and human factors training has been provided to field investigators and head office safety analysts. The role of air carrier flight safety management and management deficiencies are considered in the analysis of occurrences. (MCR 188)</p> <p><b>Status: Implemented. (MCRs 175, 188)</b></p>
<p>MCR 189</p> <p>The Transportation Safety Board of Canada formally adopt a policy recognizing that it is appropriate for the board to draw inferences of fact based on a preponderance of evidence and to refer to such inferences in its decision-making process.</p>	<p>MCR 189</p> <p>TSB, on an ongoing basis, is working on its approach to making and reporting on its findings, both findings as to fact and findings as to causes and contributing factors. TSB recognizes that, as recommended also by the <i>CTA/ISB Act</i> Review Commission, it should not hesitate to make findings on the basis of relevance to safety and technical reliability and that the TSB should not be hindered by strict criminal or civil legal standards of proof.</p> <p><b>Status: Implemented.</b></p>

### Part III: Implementation Measures

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<p>MCR 190</p> <p>Section 39 of the <i>Canada Evidence Act</i>, R.S.C. 1985, c.C-5, be amended to empower a commissioner appointed under the <i>Inquiries Act</i> to make a determination in an in camera hearing as to the appropriateness of an objection, pursuant to the provisions of section 39 of the Act and based on a confidence of the Queen's Privy Council, to production of a document. Such determination should take into consideration the nature of the document in issue and its relevance and probative value to the subject matter of the inquiry, and should weigh the claim to confidence asserted under section 39 of the Act against the public interest in full disclosure of such document. In the alternative, the provisions of the <i>Inquiries Act</i> should be amended as required to give full meaning and effect to this recommendation.</p> <p>MCR 191</p> <p>The provisions of section 13 of the <i>Inquiries Act</i> be reconsidered and that, at a minimum, appropriate amendments be introduced to provide:</p> <ul style="list-style-type: none"> <li>(a) a definition of the term "charge of misconduct," with particular focus on the meaning to be attached to the word "misconduct";</li> <li>(b) more precise direction as to the point in time that notice is to be given under section 13, taking into account the various difficulties that have been pointed out herein; and</li> <li>(c) an exemption from the notice provisions of section 13 in the case of</li> </ul>	<p>MCR 190</p> <p>The implementation of this recommendation does not directly relate to airline safety. Its implementation would also affect the confidentiality of Cabinet decision making and has implications beyond commissions of inquiry. The government will nevertheless consider the recommendation in the future should a decision be taken to pursue other amendments to the <i>Canada Evidence Act</i> or the <i>Inquiries Act</i>.</p> <p><b>Status: Under Way.</b></p> <p>MCR 191</p> <p>The implementation of this recommendation does not directly relate to airline safety. Its implementation would affect the operation of all types of commissions of inquiry. The government will nevertheless consider the recommendation in the future should a decision be taken to pursue other amendments to the <i>Inquiries Act</i>.</p> <p><b>Status: Under Way.</b></p>

### Part III: Implementation Measure

Recommendations	Implementation Measures
<p>Inquiries that have been conducted as quasi-judicial proceedings in the presence of counsel for the affected parties and with the attendant procedural and evidentiary safeguards discussed herein, or where it can otherwise be inferred that the person against whom the allegations are made had notice of the charges.</p>	