

# **Evaluation Report**

Contribution Program for the Danish and Icelandic Joint Financing Agreements

Departmental Evaluation Services  
Transport Canada

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## **LIST OF ACRONYMS**

ANSEP	Air Navigation Services Economic Panel
ASN	Aviation Safety Network
DEN/ICE	Danish and Icelandic
DES	Departmental Evaluation Services
F&A	Finance and Administration
FIR	Flight Information Region
HF	High frequency
IATA	International Air Transport Association
ICAO	International Civil Aviation Organization
TC	Transport Canada
VHF	Very high frequency
WAFC	World Area Forecast Centre

## EXECUTIVE SUMMARY

This report provides a summary of the results of an evaluation of Transport Canada's (TC) **contribution program for the Danish and Icelandic (DEN/ICE) Joint Financing Agreements**. The Treasury Board *Transfer Payment Policy* requires that an evaluation be conducted before renewal of any transfer payment program.

## BACKGROUND

- The DEN/ICE Joint Financing Agreements cover the operation and financing of facilities and services provided by Denmark and Iceland respectively for all civil aircraft crossing the North Atlantic corridor.
- The services covered comprise air traffic, meteorology, aeronautical/meteorological telecommunication services, and radio navigation aids.
- The International Civil Aviation Organization (ICAO) administers the DEN/ICE Joint Financing Agreements on behalf of all Contracting States party to the Agreements, including Canada.
- The amount traditionally budgeted for TC's contribution program is \$385,000 annually. As a result of changes to calculation methods, the Government of Canada finds itself in a credit position with respect to its contributions. Therefore, it is likely that no actual payment will be required until 2010.

## KEY FINDINGS

### Relevance

- The program's rationale and objectives align with the department's strategic objective of contributing to a safe and secure transportation system and are consistent with the Department's commitment to act in accordance with Canada's foreign policy objectives.
- The program's rationale and objectives align with the Federal Government's priorities of participating in international institutions.
- The program's rationale and objectives are consistent with the mandate and the operating principles of the Civil Aviation Directorate.
- There is a legitimate and necessary role for all Contracting States, including the Government of Canada, in ensuring that funds are available on a timely basis to operate and maintain the required services.

### Success

- Denmark and Iceland provide air traffic services, meteorological services, aeronautical/meteorological telecommunication services, and radio navigation aids. All services, as specified in the Agreements, are provided by Denmark and Iceland in a satisfactory manner. Canadian airlines are one of the most extensive users of the North Atlantic corridor and therefore, they benefit from the services provided by Denmark and Iceland.
- Despite the limitation of available data, the Civil Aviation Administrations of Denmark and Iceland are in accordance with ICAO aviation safety standards, which suggests that the services they provide, contribute to flight safety for civil aircraft.

### **Cost-effectiveness**

- The program is the most cost-effective means of achieving the intended objectives since the joint financing concept provides for economies of scale in the provision of services in the North Atlantic.

### **RECOMMENDATION**

- TC's Civil Aviation Directorate should continue to manage the DEN/ICE contribution program.

## 1.0 BACKGROUND

### 1.1 Introduction

This report provides a summary of the results of an evaluation of Transport Canada's (TC) **contribution program for the Danish and Icelandic (DEN/ICE) Joint Financing Agreements**.<sup>1</sup> The Departmental Evaluation Services Branch (DES) undertook the evaluation at the request of the **International Aviation and Technical Programs Branch** of the **Civil Aviation Directorate** in order to meet the requirements of Treasury Board Secretariat's Policy on Transfer Payments. The Policy requires that an evaluation be performed before renewal of any transfer payment program.

### 1.2 Program Profile

#### 1.2.1 The Danish and Icelandic Joint Financing Agreements

The Danish and Icelandic Joint Financing Agreements (hereafter, "the Agreements"), signed in 1956 and amended by the Montreal Protocols of 1982, cover the operation and financing of facilities and services provided by Denmark and Iceland respectively for all civil aircraft crossing the North Atlantic, north of the 45°N latitude between the meridians 15°W and 50°W. The services covered comprise air traffic, meteorology, aeronautical/meteorological telecommunication services, and radio navigation aids in the Sondrestrom and Reykjavik Flight Information Regions (FIR).

#### Roles and Responsibilities

- Denmark and Iceland are the two Provider States, responsible for the provision of services and the maintenance of the facilities in Greenland, Iceland, and the Faroe Islands<sup>2</sup>;
- The International Civil Aviation Organization (ICAO) administers these agreements on behalf of Contracting States and in accordance with Chapter XV of the Chicago Convention<sup>3</sup>;
- The United Kingdom acts as the agent for Denmark and Iceland for the billing and collection of user charges;
- 24 Contracting States (including Canada) are responsible for covering the assessments provided by ICAO annually.

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<sup>1</sup> This program is also referred to as "Payments to other governments or international agencies for the operation and maintenance of airports, air navigation and airways facilities" in the Departmental Performance Report and Public Accounts.

<sup>2</sup> The services provided by Denmark and Iceland are described in greater detail in section 3.0.

<sup>3</sup> The *ICAO Council* has authority with regards to approving actual costs, the estimates and the advances to the Provider States, settling the assessments of the Contracting Governments and the user charges, approving large projects and amending the three annexes to the Agreements. In this task, the Council is assisted by a committee it has established for this purpose, the *Joint Support Committee*. The *ICAO Secretariat* is responsible for direct links with the Provider States, day-to-day management of the Agreements, billing and collecting the assessments of Contracting Governments, and preparation of the work of the Council and the Joint Support Committee.

ICAO, a specialized agency of the United Nations, was created with the signing in Chicago, on December 7, 1944, of the *Convention on International Civil Aviation*. ICAO is the permanent body charged with the administration of the principles laid out in the Convention<sup>4</sup>.

Currently, 188 states are members of ICAO. Representatives of these States form the Assembly, which is the sovereign body of ICAO. The Council is the permanent body responsible to the Assembly and is composed of representatives from 36 member States elected by the Assembly for a 3-year term. As the governing body, the Council gives continuing direction to the work of ICAO. It is in the Council that ICAO Standards and Recommended Practices are adopted and incorporated as Annexes to the Convention on International Civil Aviation. The Secretariat, headed by a Secretary General, is divided into five main divisions: the Air Navigation Bureau, the Air Transport Bureau, the Technical Co-operation Bureau, the Legal Bureau, and the Bureau of Administration and Services<sup>5</sup>.

ICAO's overall mandate is to develop the principles and techniques of international air navigation and to foster the planning and development of international air transport. For 2005-2010, ICAO has identified six strategic objectives to fulfill its mandate: to enhance global civil aviation safety, to enhance global aviation security, to minimize the effects of global civil aviation on the environment, to enhance the efficiency of aviation operators, to maintain the continuity of aviation operations, and to strengthen laws governing international civil aviation<sup>6</sup>.

### **The Financing and Cost-Sharing Arrangement**

When the Agreements were originally signed, the Contracting States covered the entire cost of providing the services involved, with the exception of 5 percent of the cost financed by the Provider States. Over the last 47 years, the Agreements evolved considerably, with the private sector increasingly assuming most of the financing burden. The shift towards making carriers pay for the services they used began in 1974, and is reflective of a general trend across all economic sectors towards an ever-increasing utilization of user fees.

The current financing and cost-sharing arrangement is as follows (see Table 1):

- Denmark and Iceland contribute 5 percent of the total costs for providing the services, in consideration of the special benefits they derive from their operations;
- A significant part of the remaining 95 percent comes from user charges paid by operators of aircraft crossing the North Atlantic. User charges also include fees to meet ICAO's administrative costs and the United Kingdom's expenses for billing and collecting the charges;
- The remainder of the costs are covered by the Contracting States based on the number of North Atlantic crossings performed by their civil aircraft.

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<sup>4</sup> [http://www.icao.int/cgi/goto\\_m.pl?icao/en/pub/memo.pdf](http://www.icao.int/cgi/goto_m.pl?icao/en/pub/memo.pdf)

<sup>5</sup> [http://www.icao.int/cgi/goto\\_m.pl?icao/en/howworks.htm](http://www.icao.int/cgi/goto_m.pl?icao/en/howworks.htm)

<sup>6</sup> [http://www.icao.int/cgi/goto\\_m.pl?icao/en/strategic\\_objectives.htm](http://www.icao.int/cgi/goto_m.pl?icao/en/strategic_objectives.htm)



**Table 1: Allocation of Costs for the Agreements**

Percentage of Total Costs	
Denmark/Iceland	5%
Remaining Costs	95%
<b>Total</b>	<b>100%</b>

Percentage of Remaining Costs	
Users	90%
Contracting States	10%

Tables 2 and 3 display the specific costs charged to users and Contracting States for each respective agreement.

**Table 2: Allocation of Costs between Users and Contracting States for the Danish Agreement**

Users	Contracting States
<ul style="list-style-type: none"> <li>• 100% of air traffic services</li> <li>• 90% of meteorological services (surface and upper air synoptic observations) and related meteorological telecommunication services</li> <li>• 100% of aeronautical communication and satellite services; and</li> <li>• 90% of non-directional beacon at Prins Christian Sund</li> </ul>	<ul style="list-style-type: none"> <li>• 10% of meteorological costs</li> <li>• 10% of non-directional beacon at Prins Christian Sund</li> </ul>

**Table 3: Allocation of Costs between Users and Contracting States for the Icelandic Agreement**

Users	Contracting States
<ul style="list-style-type: none"> <li>• 100% of air traffic services</li> <li>• 90% of meteorological services (surface and upper air synoptic observations) and related meteorological telecommunication services</li> <li>• 100% of the international aviation function of the Meteorological office at Reykjavik and Keflavik</li> <li>• 100% of aeronautical communication and the satellite services; and</li> <li>• 100% of the VOR/DME facilities at Ingolfshoefoi</li> </ul>	<ul style="list-style-type: none"> <li>• 10% of meteorological services</li> </ul>

Furthermore, if the contributions by Contracting States are not immediately used for current payments to Denmark or Iceland, they are directed towards a Reserve Fund that may be used to cover extraordinary expenses of ICAO incidental to the Agreements, including the following:

- Visits, inspections by new ICAO Council members to Iceland and Greenland;
- Meetings;
- Conferences; and
- Study groups.

## **The Process**

The Agreements are administered by ICAO Secretariat under the direction of the ICAO Council and the Council's Joint Support Committee, as follows:

- Each year, Denmark and Iceland provide detailed estimates of the costs of providing the services for the following year;
- Following a review by the ICAO Secretariat, the estimates, with necessary explanations, particularly concerning requests for authorization to incur new capital expenditures, are then presented to the Joint Support Committee. If the Joint Support Committee is satisfied with the estimates, it recommends approval to the ICAO Council;
- On the basis of the estimates, the ICAO Council subsequently approves the assessment of the Contracting Governments as well as the amount of user charges per crossing under each Agreement, taking into account the adjustments for over/under recovery for the previous years and the forecast number of crossings for the year concerned.

### **1.2.2 Contribution Program for the Danish and Icelandic Joint Financing Agreements**

The contribution program is aimed at ensuring that the Government of Canada fulfills its financial obligations as a party to the Agreements.

The evaluators note that the program should be viewed in the larger context of Canada's relationship with ICAO and the Government's overall foreign policy objectives (this will be discussed further in sections 2.0 and 4.0). At present, these objectives are based on the understanding that Canada must take advantage of its internationalism, and that it must be effectively engaged in international institutions to achieve this goal. Accordingly, the evaluators conclude that with regards to ICAO, Canada's foreign policy aims require the Government's participation in joint financing arrangements such as the Agreements.

The management of the program is currently the responsibility of the International Civil Aviation and Technical Programs Branch/Civil Aviation Directorate. Each year, on the basis of the ICAO assessments, TC provides the requested amount through the contribution program. The workload required to manage the program is estimated to be two to three days per year and involves, besides ensuring that Canada's payments are made in a timely manner, an annual review of the reports prepared as a result of the monitoring programme established by ICAO.

The amount traditionally budgeted for TC's contribution program for the Agreements is \$385,000 annually. However, over the last several years, the actual amount paid by TC to cover the Government of Canada's portion of annual ICAO assessments has been considerably less. In fact, as explained below, no actual payment by TC will likely be required with respect to the Agreements until 2010.

### **Changes in the Calculation of User Charges**

As of January 1, 2001, the method for calculating the user charges changed. Factors such as newly adopted billing practices and the revision of costs allocable to civil aviation have initiated

the change<sup>7</sup>. Consequently, most Contracting Governments, including the Government of Canada, now find themselves in a credit position with respect to their contributions for the Agreements. Table 4 shows the amount of credit accumulated by the Government of Canada with respect to Agreements. The annual assessments of Contracting Governments are expressed in the currencies specified in Article XI of each Agreement<sup>8</sup>. The credit for the Icelandic Agreement is significantly more than that of Denmark. However, there are provisions in the Agreements allowing for the transfer of funds from the Icelandic account to the Danish account in order to cover future payments. As a result, it is expected that the credit amount accrued by the Government of Canada, totalling approximately \$US 271,270 in 2003, would be sufficient to cover both accounts until 2010.

**Table 4: Canadian Contributions to the Agreements**

<b>Agreement</b>	<b>Currency</b>	<b>1999</b>	<b>2000</b>	<b>2001</b>	<b>2002</b>	<b>2003</b>	<b>Balance</b>
Icelandic Agreement	US Dollar	35,399	46,835	-243,357	-231	11,952	-231,636
		(note 1)		(note 2)		(note 3)	
Danish Agreement	Danish Kroner	312,755	268,014	-541,710	93,145	177,125	-277,440
				(note 2)	(note 3)	(note 3)	

*Note 1: Only US\$ 24,251 was actually paid because of previous credit balance in the account.*

*Note 2: Significant negative assessment as a result of changes in the method of calculation of user charges transferring to the users the burden of financing the delays and defaults of payments by airlines which were previously financed by Contracting States.*

*Note 3: No payment was actually made because of previous credit balance in the account.*

<sup>7</sup> The following factors led to the changes in the calculation of user charges: (1) annual user charges now based on forecast air traffic rather than two-year-old historical data; (2) income generated from user charges now based on actual cash receipts rather than on airline billing amounts, the result being that any delays and/or defaults of payments from users is now financed by the users rather than Contracting Governments; (3) the percentage of costs allocable to civil aviation was revised in 1999.

<sup>8</sup> Article XI of the Danish Agreement stipulates that “the annual assessments of Contracting Governments shall be expressed in Danish Kroner”. Article XI of the Icelandic Agreement stipulates that “the annual assessments of Contracting Governments shall be expressed in United States Dollars”.

### **1.3 Program Logic Model**

Table 5 shows the main activities and outcomes for TC's contribution program to the Agreements.

The Government of Canada is one of 24 Contracting States that are party to the Agreements. TC provides funding for the Government of Canada's share of the costs. In providing this funding, the Government of Canada fulfills its obligations as party to the Agreements. In so doing, funds are available on a timely basis to operate and maintain facilities that are necessary to provide the required services. The joint financing arrangement contributes to the cost-effective delivery of these services, which in turn is intended to enhance the flight safety of Canadian civil aircraft using the North Atlantic corridor. Ultimately, the program contributes to a safe and secure transportation system.

**Table 5: Logic Model**

<b>LOGIC MODEL –Danish and Icelandic Joint Financing Agreements</b>			
<b>ACTIVITIES</b>	<b>IMMEDIATE OUTCOMES</b>	<b>INTERMEDIATE OUTCOMES</b>	<b>ULTIMATE OUTCOME</b>
<p>Government of Canada enters into the Agreements.</p> <p>Government of Canada provides funding for its share of the costs, as outlined in the Agreements, based on ICAO-approved estimate assessments.</p>	<p>Government of Canada fulfills its obligations as party to the Agreements.</p> <p>Funds are available on a timely basis to operate and maintain the required services and facilities.</p>	<p>Upholds flight safety for Canadian civil aircraft using the North Atlantic corridor through the provision of following services:</p> <ul style="list-style-type: none"> <li>• Air Traffic Control services</li> <li>• Meteorological services</li> <li>• Aeronautical and Meteorological Telecommunication services</li> <li>• Radio navigation aids</li> </ul> <p>Cost-effective delivery of services through the joint financing arrangement.</p>	<p>A safe and secure transportation system.</p>

## 1.4 Study Rationale

The study was conducted to assess the program's relevance, success and whether there are alternative, more cost-effective ways of delivering the program in order to provide input for future decision-making. The study was also conducted to fulfil requirements of Treasury Board Secretariat's Policy on Transfer Payments for renewal of the contribution program.

## 1.5 Evaluation Issues

The evaluation study assessed the following questions to determine the program's relevance, success and cost-effectiveness:

### A. Program Relevance

- 1) Is the program relevant to and aligned with TC's strategic objectives and priorities?
- 2) Is the program consistent with federal government's objectives and priorities?
- 3) Is the program aligned with the Civil Aviation Directorate's mandate?
- 4) Is there a legitimate and necessary for government in this area?

### B. Program Success and Impacts

- 5) Are all the services indicated in the agreement provided in a satisfactory manner? Do Canadian airlines use these services?
- 6) Do the services contribute to flight safety for civil aircraft?

### C. Cost-effectiveness

- 7) Is the program the most cost-effective means of achieving the intended objectives?

## 1.6 Methodology and Data Sources

The evaluation team developed an evaluation strategy and selected methods for collecting the data needed to address the above evaluation questions.

### Document/Program File/Website Review

The first step involved a review of the following relevant documents and program files.

- Agreement on the Joint Financing of Certain Air Navigation Services in Iceland;
- Agreement on the Joint Financing of Certain Air Navigation Services in Greenland (Denmark);
- ICAO documents, including working papers, study group reports and yearly spreadsheet on the settlement of obligations with Denmark and Iceland;
- Relevant program files from International Aviation and Technical Programs Branch; and
- ICAO, TC, and Aviation Safety Network websites.

## **Interviews**

The interview method was chosen as the second step to address any information gaps as well as to obtain a more contextualized understanding of the issues involved. An open-ended, semi-structured interview format was used for all of the interviews as follows:

- TC's International Civil Aviation and Technical Programs Branch Staff; and
- ICAO's Joint Financing Section officials.

## 2.0 PROGRAM RELEVANCE

- 1) Is the program relevant to and aligned with TC's strategic objectives and priorities?

**Finding: The program's rationale and objectives align with the department's strategic objective of ensuring high standards for a safe and secure transportation system and are consistent with the Department's commitment to act in accordance with Canada's foreign policy objectives.**

Through the Agreements, TC participates in the implementation of an international cooperative arrangement providing certain air navigation services. These services are necessary for maintaining the flight safety of aircraft crossing the North Atlantic. Through the program, TC contributes to ensuring that funds are available on a timely basis for the provision of air navigation services necessary for the flight safety of Canadian civil aircraft flying across the North Atlantic. As such, the program's rationale is well aligned with TC's strategic objective of ensuring high standards for a safe and secure transportation system.

As well, the program's objective of ensuring that the Government of Canada fulfils its international obligations is consistent with TC's commitment to act in accordance with Canada's foreign policy objectives. This commitment is borne out of the understanding outlined in *Straight Ahead: A Vision of Transportation in Canada* that, "given Canada's trade oriented economy, TC must take into account and adapt to factors outside its boundaries". The program's objective therefore aligns with the Department's commitment to supporting Canada's foreign policy objectives.

- 2) Is the program consistent with federal government's objectives and priorities?

**Finding: The program's rationale and objectives align with the Federal Government's priorities with respect to Canada's internationalism.**

The program's rationale and objectives are also consistent with the federal government's current priorities, as outlined in the most recent Speech from the Throne delivered on October 5, 2004. The Speech stated that Canada's "internationalism [was] a real advantage" and underscored the importance of "[expressing] it if [Canada is] to effectively assert [its] interests and project [its] values in a changing world". Also highlighted in the Speech was the "need [for] international institutions that work" to achieve this goal.

Canada has historically been a strong supporter of ICAO in its efforts to develop the principles and techniques of international air navigation and to foster the planning and development of international air transport. In fact, Canada was instrumental in the formation of the agency during the Chicago Convention of 1944, when it played a key role in overcoming the so-called 'U.S.-U.K. stalemate' that was threatening to stymie the enterprise by initiating the tripartite meetings involving the three governments<sup>9</sup>. Over the years, ICAO has been instrumental in meeting a number of challenges facing international civil aviation, including filling the gaps in the global air navigation infrastructure, anticipating and managing the enormous change from propeller-driven aircraft to jet engine aircraft, the need

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<sup>9</sup> FREER, Duane, "ICAO at 50 Years: Riding the Flywheel of Technology", ICAO Journal, Vol. 49 No. 7, September 1994, pp.19-32.



to ensure passenger and aircraft security, transportation of dangerous goods, and the need to reduce aircraft noise and aircraft emissions.

Today, international civil aviation is facing several new major challenges. As outlined in ICAO's strategic action plan, there is a great need for ICAO to adapt to rapidly changing circumstances such as the transnationalization of markets and operations, emergence of regional and sub-regional regulatory blocks, commercialization of government service providers, emergence of new technology, response to environmental concerns, and the physical limits of infrastructure capacity. As a heavily trading nation, Canada is also facing many of the same challenges.

As such, ICAO is a forum where Canada can put into effect its internationalist approach, working with other nations in the consideration of numerous issues affecting international civil aviation, as well as advance its various policy objectives delineated in *Straight Ahead*, including "the promotion of a co-operative approach to international harmonization of safety and security standards", and its efforts to encourage a shift in emphasis from "prescriptive regulation to a comprehensive, performance-based approach to safety" as part of TC's Smart Regulation initiative.

It is clear to the evaluators that TC's participation in the Agreements not only ensures that the Government of Canada fulfills its international obligations but also demonstrates Canada's commitment to strengthen international institutions through effective engagement.

3) Is the program aligned with TC's Civil Aviation Directorate's mandate?

**Finding: The program's rationale and objectives are consistent with the mandate and the operating principles of the Civil Aviation Directorate.**

A 2003 Civil Aviation Directorate memorandum stated that there were no longer any major linkages of the program to civil aviation, given that the Government of Canada's payments are primarily directed towards meteorological services non-allocable to users within the civil aviation sector<sup>10</sup>. Accordingly, the memorandum raised the issue of whether the responsibility for managing DEN/ICE contributions should remain within the Civil Aviation Directorate. The evaluators examined the arguments put forward in the memorandum and concluded that the rationale and the objectives of the program were consistent with the mandate and the operating principles of the Civil Aviation Directorate.

The Civil Aviation Directorate memorandum recommended that:

- Transport Canada's Finance and Administration (F&A) Directorate / Corporate Services Group consider accepting the responsibility for the management of the DEN/ICE contributions, beginning in 2004/05; and
- F&A Directorate enter into discussions with the Meteorological Service of Canada / Environment Canada to encourage the latter to take over the responsibility for DEN/ICE contributions on or before the beginning of 2010/11, when Canada's credits are likely to have been fully expended.

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<sup>10</sup> For a detailed discussion on the allocation of meteorological costs under the Agreements, please see Annex 1.

Despite the fact that the Government of Canada's payments primarily fund meteorological services non-allocable to users within the civil aviation sector, the evaluators hold that there are several arguments militating against the course of action recommended in the memorandum:

- The contribution program is not well aligned with the mandate of F&A Directorate/ Corporate Services Group. The F&A Directorate's mission is to provide services, expertise and advice in the areas of finance and administration that support the achievement of TC's goals. The responsibility of managing the file falls outside the general support role of the F&A Directorate. Moreover, management of this program would conflict with the activities of F&A Directorate relating to the provision of assessments, and corporate oversight and control.
- The primary outcome achieved by the program relates to civil aviation safety. This outcome does not align with any of Environment Canada's three primary strategic objectives, which consist of: protecting Canadians and their environment from domestic and global sources of pollution; conserving biodiversity in healthy ecosystems; and, helping Canadians adapt to their environment in ways that safeguard their health and safety, optimize economic activity and enhance environmental quality.
- ICAO coordinates the Agreements, situating the program within the context of the civil aviation sector. In addition, all Contracting States manage their respective files related to the Agreements either through their transportation ministries or their civil aviation authorities. None of the Contracting States presently confer the responsibility for administering the DEN/ICE contributions to their ministries of environment.

In addition, there are several arguments for maintaining the status quo.

- The Civil Aviation Directorate's *mandate* is encapsulated in their mantra: "We are here for aviation safety"<sup>11</sup>. The Agreements, and the role played by the Contracting States with regards to the Agreements, are key to providing stability in servicing the North Atlantic corridor. The air traffic, communications and meteorological services provided are necessary in ensuring flight safety of Canadian Civil aircraft using this corridor. Therefore, the program aligns with the mandate of the Civil Aviation Directorate.
- As well, one of Civil Aviation Directorate's primary *operating principles* is the "promotion of a shared commitment to enhancing aviation safety ... internationally". By participating in the DEN/ICE Agreements, Transport Canada demonstrates that it is committed to remain proactively involved with joint international civil aviation mechanisms regarding flight safety of its civil aircraft. This commitment aligns with Civil Aviation's stated desire to enhance aviation safety through international cooperation.
- The 2003 memorandum had argued that TC's contribution program was not well aligned with the International Aviation and Technical Programs Branch's mandate regarding the development of technical standards and practices. However, the mandate of the Branch also includes the provision of support for international civil aviation matters. For example, the Branch has the responsibility of coordinating other international aviation agreements such as the North American Aviation

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<sup>11</sup> Flight 2005, <http://tcinfo/CivilAviation/Flight2005/Menu.htm>

Trilateral (NAAT), and bilateral/trilateral liaison requirements of special nature. The outcomes achieved by TC's contribution program for the Agreements clearly situate it in the area of international aviation.

Taking into account the arguments above, the evaluators concluded that the rationale and the objectives of the program continue to be aligned with the overall mandate of the Civil Aviation Directorate, as well as the mandate of its International Aviation and Technical Programs Branch.

**Recommendation:** Transport Canada's Civil Aviation Directorate should continue to manage the DEN/ICE contribution program.

4) Is there a legitimate and necessary role for government in this area?

**Finding: There is a legitimate and necessary role for all Contracting States in ensuring that funds are available on a timely basis to operate and maintain the required services.**

Were the Government of Canada no longer a participant in the Agreements, Canadian civil aircraft crossing the North Atlantic would still be using the air navigation services provided by Denmark and Iceland. As well, under the Agreements, there is no difference between the fees paid by aircraft belonging to Contracting Governments and the fees paid by aircraft belonging to non-adherent states such as Austria, India or Czech Republic: a single flat user fee is charged to all civil aircraft flying across the North Atlantic. Finally, as previously noted, 90 percent of the costs involved are now recovered directly from the users of the services. Given these facts, it is reasonable to raise the issue of whether there remains a meaningful role to play by Contracting States - and ICAO - in the provision of air navigation services in the North Atlantic. Under such a scenario, the costs of the services provided by Denmark and Iceland would no longer be subject to the rigorous process of verification and approval currently performed by ICAO on behalf of Contracting States (see 'Process' in section 1.2.1), likely resulting in higher user charges.

According to officials from ICAO's Joint Financing Section, the Agreements represent a mechanism to manage risk with respect to the provision of air navigation services in the world's most heavily traveled trans-oceanic route. The Agreements are designed for Contracting States to help the Provider States cope with the fluctuations of the marketplace in delivering air navigation services. The importance of this may not be readily apparent, as most Contracting States, including the Government of Canada, currently find themselves in a credit position following the readjustment of charges that occurred in 2001. However, as indicated by ICAO's Joint Financing Section officials when interviewed, in any future under-recovery situation, parties to the Agreements may be asked to cover the ensuing shortfalls. Additionally, the Agreements constitute a safeguard against prospective "exceptional circumstances" e.g. a drastic and sustained reduction in traffic levels. In case of any such unforeseen event, Contracting States would be requested by ICAO to provide temporary funding in support of the provision of air navigation services. Overall, the system of prepayments, advances and subsequent adjustments prevents cash flows from being delayed, ensuring the work of the two Provider States are not hindered. Therefore, Contracting States continue to have a role with respect to the primary purpose of the Agreements, which is to ensure that funds are available on a timely basis to operate and maintain the required services. As such, evaluators conclude that there is a legitimate role for the Contracting States, including the Government of Canada, in this area.

### 3.0 SUCCESS AND IMPACT OF THE PROGRAM

- 5) Are all the services indicated in the Agreement provided in a satisfactory manner? Do Canadian airlines use the services?

**Finding: Denmark and Iceland provide air traffic services, meteorological services, aeronautical/meteorological telecommunication services, and radio navigation aids. All services as specified in the Agreements are provided by Denmark and Iceland in a satisfactory manner. Canadian airlines are one of the most extensive users of the North Atlantic corridor and therefore, they benefit from the services provided by Denmark and Iceland.**

Denmark and Iceland each provide the following services:

- Air Traffic services: Air traffic services comprise air traffic control service, flight information service and alerting service. The main facilities for providing air traffic services in the North Atlantic corridor are the area control centre in Reykjavik, Iceland and the flight information centre at Sondre Stromfjord, Greenland.
- Meteorological services: Meteorological services include meteorological observations (e.g. surface and upper-air synoptic observations), reports, forecasts, and briefing and flight documentation completed at meteorological stations specified in the Agreements. Under the Icelandic agreement, other services provided by the meteorological offices include the provision of routine aerodrome forecasts, area meteorological watch, and the issuance of SIGMET<sup>12</sup> information.
- Aeronautical and Meteorological Telecommunication services: Telecommunication services include the collection and reception of meteorological reports from jointly financed synoptic stations, reception of meteorological messages, aeronautical fixed telecommunication services for transmission of aeronautical and meteorological messages, aeronautical mobile service with aircraft on high frequency (HF) and very high frequency (VHF) extended range, landline teletypewriter services, microwave link and communications, telephone services, telegraph and data services, and remote keying services.
- Radio navigation aids: Radio navigation aids are located at various locations as specified under the Agreements to provide en-route navigation services on a continuous basis.

Each year, the Secretary General of ICAO submits *Summary Reports on the Operation and Utilization of the Services* by Denmark and Iceland to current and prospective Contracting States of the Agreements. These summary reports rate the provision and availability of services for North Atlantic flights.

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<sup>12</sup> SIGMET information refers to information concerning en-route weather hazards, which may affect the safety of aircraft operation.

From 1999 to 2003, the availability of various air navigation services provided by Denmark were as follows:

- Air traffic services to international flights operating within Sondrestrom FIR were provided without any operational interruption during the five-year period;
- Meteorological services were also provided in a satisfactory manner throughout the five-year period;
- In general, the communications services operated satisfactorily during the five-year period with the exception of the extended range of VHF services at Prins Christian Sund and Frederiksdal. These services were inoperative for approximately 53 hours in 2000, 10 hours in 2001, 578 hours in 2002, and 178 hours in 2003. The disruptions were mainly due to bad weather and/or technical problems;
- The non-directional radio beacons performed satisfactorily overall with the exception of the beacon at Prins Christian Sund, which was inoperative for approximately 25 hours in 2000 due to weather conditions. The beacons at Myggenaes and Akraberg, were out of service for approximately 38 hours due to maintenance in 2001. The beacon at Prins Christian Sund was inoperative for approximately 719 hours in 2002 due to weather conditions and technical problems; and the beacons at Myggenaes and Akraberg were of service for approximately 3 hours in 2002 due to maintenance.

Although there were some service disruptions with regards to some communication services and radio navigation aids during the five-year period, the Secretary General of ICAO found that all services as specified in the Danish Agreement were provided in a satisfactory manner.

From 1999 to 2003, the availability of various air navigation services provided by Iceland were as follows:

- Air traffic control services to international flights operating within Reykjavik control area were provided without any operational interruption during the five-year period;
- Meteorological services were also provided in a satisfactory manner throughout the five-year period;
- No major disruptions were reported in the delivery of various communications services. Since 1999, the number of air/ground contacts on HF and VHF communications has steadily declined;

Overall, the Secretary General of ICAO found that all services as specified in the Icelandic Agreement were provided by Iceland in a satisfactory manner for five-year period.

Canadian airlines crossed the North Atlantic corridor an average of 21593 times between 1999 and 2003. As shown in Figure 1, the highest number of crossings occurred in 2000. The number of crossings has declined slightly in recent years.

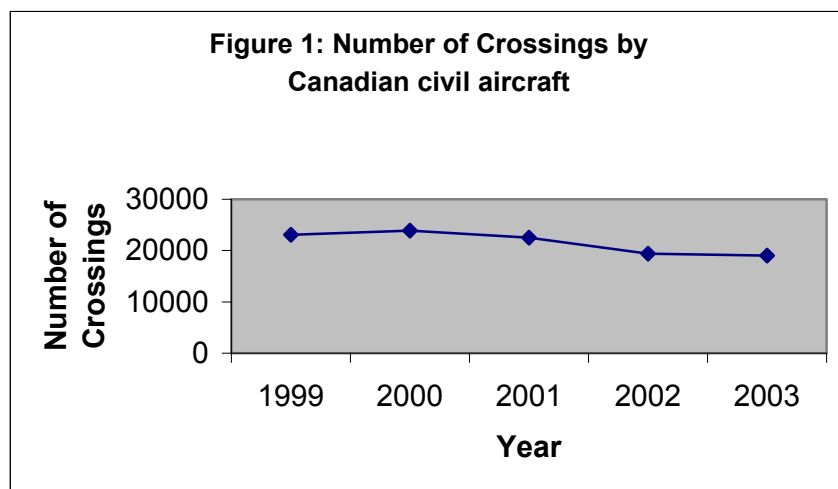


Table 5 displays the top five countries that have airlines flying across the North Atlantic corridor. Canada is shown to be one of the top four users of the air navigation services provided by Denmark and Iceland.

**Table 5: Number of Crossings by Country**

	1999	2000	2001	2002	2003
<b>1. United States</b>	124909	131061	128883	123211	123637
<b>2. United Kingdom</b>	45262	47238	45687	44950	46898
<b>3. Germany</b>	21490	23498	23344	22787	25591
<b>4. Canada</b>	23104	23913	22502	19398	19046
<b>5. France</b>	15835	18047	17783	18331	18180

As Canadian airlines are one of the most extensive users of the North Atlantic corridor, they benefit from the satisfactory air navigation services provided by Denmark and Iceland under the Agreements.

6) Do the services contribute to flight safety for civil aircraft?

**Finding: Despite the limitation of available data, the Civil Aviation Administrations of Denmark and Iceland are in accordance with ICAO aviation safety standards, which suggests that the services they provide contribute to flight safety for civil aircraft.**

As defined in ICAO’s International Standards and Recommended Practices, these services contribute to the safety of international air navigation.

- Air traffic services aim to prevent collisions between aircraft; prevent collisions between aircraft on a manoeuvring area and obstructions on that area; expedite and

maintain an orderly flow of air traffic; provide advice and information useful for the safe and efficient conduct of flights; and notify and assist appropriate organizations regarding aircraft in need of search and rescue aid.

- Meteorological services involve the supplying of necessary meteorological information to aid operators, flight crewmembers, air traffic service units, search and rescue services units, and airport managements in the performance of their respective functions. For aircraft flying across the North Atlantic corridor, the provision of weather phenomena information can assist their safe operation and navigation through the region.
- Aeronautical and meteorological telecommunication services comprise communication services and application entities in support of the delivery of air traffic and meteorological services to aircraft between airborne systems and ground systems or multiple ground systems.
- Radio navigation aids such as non-directional radio beacons work in conjunction with direction-finding equipment in the aircraft to fulfil the operational requirement of a radio aid to navigation. In this way, pilots can determine the aircraft's bearings relative to a station and facilitate a safer approach and landing.

The evaluators experienced great difficulty in obtaining quantitative data to demonstrate a connection between the provision of certain air navigation services by Denmark and Iceland and level of flight safety in the North Atlantic region. According to the Aviation Safety Network (ASN) Database<sup>13</sup>, 15 flight accidents/incidents have occurred in Greenland since 1945 and 12 flight accidents/incidents have occurred in Iceland since 1957. Unfortunately, these events may or may not be attributed to the provision of services by Denmark and Iceland. Several other factors could have contributed to the various accidents/incidents, such as pilot error or technical difficulties with the aircraft. Furthermore, the ASN database consists only of reported accidents/incidents due to aircraft damage and/or the occurrence of fatalities. It does not include occurrences where an unsafe situation was avoided.

However, ICAO does assess and monitor international air safety through the ICAO Universal Safety Oversight Audit Program. The Civil Aviation Administration of Denmark and the Icelandic Civil Aviation Administration were audited in 1999 and 2000. The audits were carried out with the objective of ascertaining the safety oversight capability of the civil aviation administrations and to ensure their operations were in conformity with ICAO Standards and Recommended Practices as contained in Annexes, guidance material, and relevant safety-related practices in general use in the aviation industry. A limitation of these audits is that there was no specific investigation into the level of safety yielded by air navigation services<sup>14</sup>. However, the ICAO safety audit oversight team found that the structures of the civil aviation administrations for both Denmark and Iceland provided an effective civil aviation system to support its safety oversight obligations and responsibilities. Since both civil aviation administrations were found to be in accordance with ICAO aviation safety standards, the results of the audit suggest that Denmark and Iceland do uphold their responsibilities with respect to flight safety.

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<sup>13</sup> ASN is an independent on-line source, which maintains an air accident database. Sources used for the database include aircraft production lists, ICAO Aircraft Accident Digests, National Transportation Safety Board etc.

<sup>14</sup> As of 2005, ICAO has expanded the Safety Oversight Audit Program and all future audits will include an investigation of air navigation services.

Despite the limitation of available data, the Civil Aviation Administrations of Denmark and Iceland are in accordance with ICAO aviation safety standards, which suggests that the services they provide contribute to flight safety for civil aircraft.

#### 4.0 COST-EFFECTIVENESS OF THE PROGRAM

7) Is the program the most cost-effective means of achieving the intended objectives?

**Finding: The program is the most cost-effective means of achieving the intended objectives since the joint financing concept provides for economies of scale in the provision of services in the North Atlantic.**

The Agreements enable the provision of the required air navigation services for all civil aircraft – including Canadian aircraft - crossing the North Atlantic to enhance their flight safety. These services are provided to Canadian aircraft without the Government of Canada, or a private provider such as NAV CANADA, having to bear the full cost of building, maintaining and operating similar facilities necessary to provide such services. Cost-effectiveness is achieved through the joint financing concept, as the facilities and costs involved in providing a given service are beyond the needs of a single state, such as Canada. In 2004, the estimated cost of the services covered by the Agreements was US\$29.2 million (US\$5.8 million for Denmark and US\$23.4 million for Iceland).

The gains achieved through cost sharing are then translated into lower charges for the users of the services provided, namely the aircraft operators. This is important for full service carriers such as Air Canada that use the North Atlantic corridor extensively, since lower user charges mean lower operating costs. According to International Air Transport Association (IATA) figures, such charges alone account for approximately 10 percent of airline operating costs of IATA scheduled international operations.

In terms of value, the user fees charged by Denmark and Iceland appear to be consistent with, if not lower than, similar fees charged by other air navigation services providers. Evaluators note that any comparisons between user fees charged by different entities providing similar services in other geographic areas should be undertaken with considerable caution, as the principles and the methodologies for determining such fees may vary appreciably amongst various service providers. For example, under the Agreements, a movement-based, single flat user fee is charged to all civil aircraft flying across the North Atlantic. Elsewhere, user fees may be determined according to different criteria, such as the weight of the aircraft. Nevertheless, some limited comparisons can be made.

In 2004, the fee for a full crossing over the North Atlantic charged by Denmark and Iceland was nearly \$130 Can (£56.74<sup>15</sup>). By comparison, an aircraft flying between Canada and Europe would also typically pay for a NAV CANADA Oceanic Charge, which includes a flat fee for North Atlantic Enroute Facilities and Services (NAT)<sup>16</sup>, and, frequently, an International Communications Charge for the provision of air-ground radio frequencies and certain other communication links. In 2004, the combined NAV CANADA charge per flight for providing

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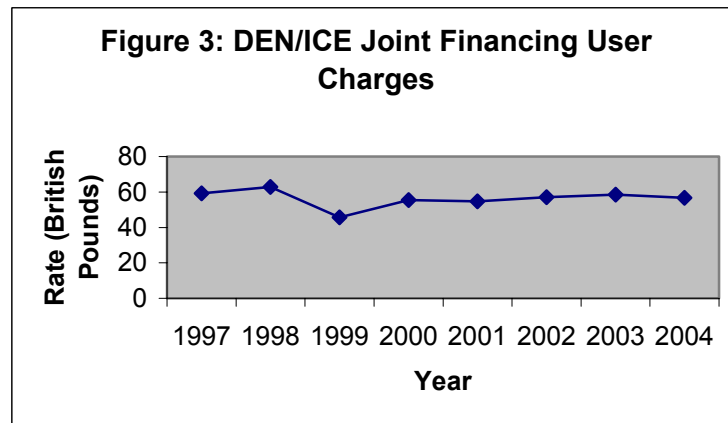
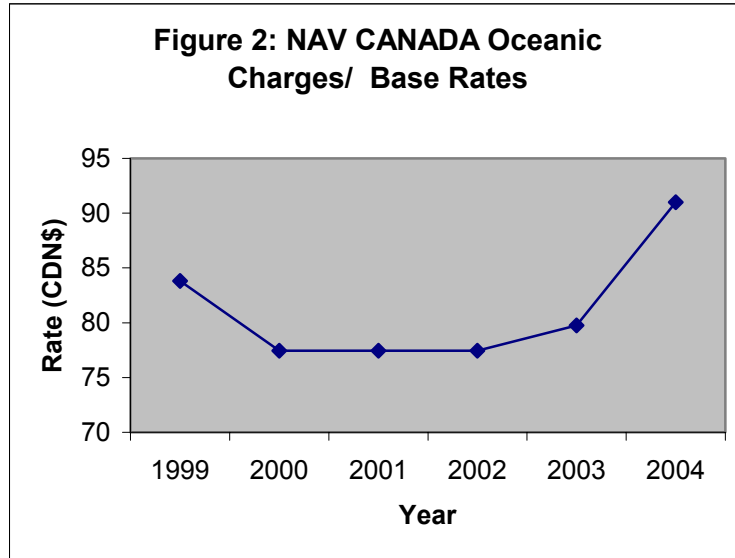
<sup>15</sup> User charges are levied in British Pounds.

<sup>16</sup> The NAT Charge is for the provision of air navigation services to an aircraft during the course of a flight in the Gander Oceanic FIR/CTA.



these services equalled roughly \$150 Can. Thus, the fee charged by NAV CANADA for similar services to an identical aircraft flying between Europe and Canada is slightly higher than the fee charged by Denmark and Iceland collectively.

In addition, under the Agreements, user charges have remained relatively constant (see Figure 3) while the overall air navigation charges around the world have increased 7.5 percent annually since 1992<sup>17</sup>. In Canada, the flat fee charged by NAV CANADA as part of Oceanic Charges has increased 15 percent since March 1, 1999, when it began implementing full cost recovery<sup>18</sup> (see Figure 2).



In light of the above, the fees charged by Denmark and Iceland appear to represent good value for the users of the services provided.

It should also be noted that, notwithstanding foreign policy purposes served by, and cost effective services resulting from the Agreements, should the Government of Canada wish to withdraw, it

<sup>17</sup> <http://www.iata.org/workgroups/ucp.htm>

<sup>18</sup> Temporary fee adjustments were in effect between March 1, 1999 and January 1, 2002 in order to return to customers excess revenue over expenses.

would cost TC approximately \$US 1 million<sup>19</sup>. The evaluators confirmed that, in accordance with Articles XXII and XXIV, paragraph 2 of the Agreements, any Government withdrawing from the Agreements would have to pay Denmark and Iceland, through ICAO, its share of the residual value of the capital expenditures. At present, the Government of Canada's portion of residual value amounts to roughly \$US 1 million, or 6.7% of the total residual value.

As previously stated, Canada's relationship with ICAO should be viewed in the larger context of the Government's objective of taking advantage of Canada's internationalism, which necessitates an effective engagement in international institutions. Accordingly, the evaluators conclude that Canada's commitment to ICAO entails participation in joint financing arrangements such as the Agreements, and that, from a cost perspective, this type of arrangement represents the most sensible approach to mounting costly international civil aviation projects, as it distributes the financial burden amongst the participants by reducing their share of capital requirements and operational and maintenance costs.

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<sup>19</sup> As of December 31, 2003, the total residual value of the capital expenditures under the Agreements amounted to approximately US\$ 14.7 million: US\$ 2.5 million under the Danish Agreement, and \$US12.2 million under the Icelandic Agreement.

## 5.0 ANNEXES

### ANNEX 1

#### Allocation of Meteorological Costs under the Agreements

Given that TC's contributions are primarily directed to fund meteorological services that are non-allocable to users in the civil aviation sector, it is important to provide background information on the evolution of the Agreements with regards to allocation of meteorological costs.

Under the DEN/ICE Agreements, meteorological services provided refer to the following:

#### Meteorological (MET) Services

##### ICELAND

SERVICES	Surface and upper-air observations	Provision of routine aerodrome forecasts and necessary amendments for Keflavik and Reykjavik	Provision of area meteorological watch for the Reykjavik FIR including the issue of SIGMET information
FACILITIES	Meteorological stations at: <ul style="list-style-type: none"> <li>• Bolungarvik</li> <li>• Akurnes</li> <li>• Keflavik</li> </ul>	Meteorological office at Reykjavik	Meteorological office at Reykjavik

##### DENMARK

SERVICES	Surface and upper-air observations
FACILITIES	Meteorological stations at: <ul style="list-style-type: none"> <li>• Danmarkshavn</li> <li>• Narsarsuaq</li> <li>• Egedesminde</li> </ul>

Under the Agreements MET/COM services are also taken into consideration when calculating meteorological costs allocable to civil aviation

**Meteorological Telecommunication Services (MET/COM)****ICELAND**

SERVICES	Collection of meteorological reports from jointly financed synoptic stations in Iceland and their retransmission to Regional Telecommunications HUB Bracknell	Reception of meteorological reports from jointly financed synoptic stations in Greenland and their retransmission to Regional Telecommunications HUB Bracknell	Reception of meteorological messages originating in Europe and North America (except Greenland) from Regional Telecommunications HUB Bracknell
FACILITIES	Reykjavik	Reykjavik	Reykjavik

**DENMARK**

SERVICES	Collection of meteorological reports	Aeronautical fixed telecommunication services for transmission of aeronautical and meteorological messages
FACILITIES	Sondre Stromfjord	Sondre Stromfjord

In 1997, the ICAO Council requested that the Committee on the Joint Support of Air Navigation establish a study group to undertake a fact-finding study on the utilization of meteorological services by aviation and non-aviation users to complement the information already provided by Denmark and Iceland. In 1998, the Study Group on Allocation of Meteorological Costs (the “Study Group”) was established.

At the time when the Study Group was convened, 60 percent of meteorological costs were allocated to civil aviation. However, the trend has been for more of the meteorological costs to be covered by civil aviation users. The primary guidance document used in the deliberations of the Study Group was the *Manual on Air Navigation Services Economics* (“the Manual”). The version that was used (ICAO Doc 9161/3) had incorporated the recently completed work of the Air Navigation Services Economics Panel (ANSEP). It was generally agreed that the guidelines established by ANSEP allowed for an increase in the percentage of meteorological costs that could be allocated to civil aviation. At the same time, the Manual stipulated that considerable caution should be exercised when determining the costs allocable to civil aviation since no single user requirement determines the level and cost of core activities.

The following are a summary of the main items of the report<sup>20</sup> prepared by the Study Group:

- The users’ position was that the observations being conducted by Iceland and Denmark were undoubtedly essential during the era prior to the jet age, but that there was no longer an aeronautical requirement for the surface and upper-air observations provided under Agreements to support current aircraft operations in the North Atlantic Region.

<sup>20</sup> ICAO / Report / Study Group on Allocation of Meteorological Costs

- However, experts from World Area Forecast Center (WAFc)/London and WAFc/Washington clearly demonstrated to the Study Group that all meteorological observations (including surface and upper-air observations) played an important role in the numerical weather prediction used to generate products from WAFcs. Therefore, aviation had an indirect requirement, through WAFc use, for all the observations provided by Greenland, Iceland, the Faroes and surrounding sea areas. The Study Group was also reminded that the Limited North Atlantic Regional Air Navigation meeting held in Portugal in 1992 had confirmed the continued requirement for the Danish and Icelandic stations.
- According to IATA, the airlines already contributed to the provision of upper-air data through the air reporting, and the meteorology community at large benefit from these data for which airlines do not ask to be paid. However, the Study Group noted that aircraft observations and reports were an aeronautical requirement by the air traffic control and ICAO World Area Forecasting System and were to be reported anyway. Moreover, aircraft reports could presently not substitute for the upper-air and surface observations, due to their concentration over a small range of altitudes and to the lack of humidity information.
- The Study Group concluded that the arguments presented supported an increase of meteorological costs allocable to civil aviation up to 100 percent. In addition, the Study Group noted that, guidelines recently established by ANSEP allowed for 100 percent of meteorological costs to be allocated to civil aviation. However, taking into account both the lack of tools to determine exactly the percentage use of the observations between aeronautical and non-aeronautical users, and the need to find a viable methodology that would be equitable to all concerned, the Group concluded that a cost recovery of 90 percent would be reasonable.

On the basis of the conclusions reached by the Study Group, the Joint Support Committee recommended that the ICAO Council increase the meteorological costs allocable to civil aviation under the Agreements, from 60 to 90 percent effective January 1, 1999. The Council subsequently adopted the recommended action during its 155<sup>th</sup> session.

The increase means more of the costs of air navigation services under the Agreements are now recovered directly from the private sector, decreasing the financial burden on the Contracting States.