



Transport Canada  
Safety and Security

Transports Canada  
Sécurité et sûreté

Canada

# SATOPS

Final Report - SPRING 1998





## MESSAGE FROM THE DIRECTOR GENERAL, CIVIL AVIATION

I am pleased to announce the release of the Safety of Air Taxi Operations Task Force (SATOPS) report. It contains 71 recommendations to improve the safety of the Air Taxi sector of the civil aviation system. I am committed to implementing those recommendations aimed at Transport Canada as determined by the action plan within the implementation phase of the project. I seek an equal assurance from the Air Taxi community and other groups involved in this sector to address the problem areas identified. Only together can we make the required improvements in safety.

Canada enjoys one of the safest aviation systems in the world. However, the number of accidents occurring in Air Taxi operations continues to be of great concern to Transport Canada. The latest figures show that Air Taxi accidents have decreased from the previous five year average of 107.2 to 90 in 1996. Nevertheless, the 1996 figure represents 62% of the total number of accidents in all commercial operations. The number of Air Taxi fatal accidents and fatalities has decreased from 23 fatal accidents and 53 fatalities in 1995 to 20 fatal accidents and 34 fatalities in 1996. This represents 95% of the total number of fatal accidents and fatalities in all commercial operations, an increase from 1995 when the percentage was 94%. Compare this to the United States where there were 88 Air Taxi accidents in 1996, 28 of them fatal with 61 fatalities. Clearly, this comparison is not favourable, given that the U.S. Air Taxi industry is at least five times larger than Canada's.

"The actions and attitudes of operating personnel are a reflection on those who employ and represent them." This quotation from the International Civil Aviation Organization (ICAO) Human Factors Digest, Management & Organization, Management's Role in Safety, cannot be stressed strongly enough. A safe air operator must be led by management who are committed to safety in every aspect of day-to-day operations. Management must actively establish and sustain a safety culture within the company based on open communication and mutual respect.

Transport Canada does not believe that an increase in the regulations will necessarily result in a decrease in the number of accidents. A disregard of the regulations has often been found to be the initiating event in accidents. The Canadian Aviation Regulations provide an excellent "code of conduct" for the aviation industry. While the majority may operate within the boundaries of the regulations, strong regulatory action must and will be taken against the minority who disregard the regulations. What is required is to improve our attitudes toward safe operations and to adopt a better safety culture within the Air Taxi industry.

The SATOPS project has from the beginning been a partnership between Transport Canada and the aviation industry. This project would not have been possible without the Air Taxi

community's participation. I wish to thank all of you who took the time to attend a SATOPS meeting or send in your comments from the Feedback questionnaire. Clearly, this partnership must continue to address the recommendations contained in the report and to ultimately reduce the number of accidents in Air Taxi operations.

NAV CANADA, the Transportation Safety Board and the aviation associations will be consulted in the development of an implementation plan to address the SATOPS recommendations. A status report will be published every six months to track the ongoing progress of the implementation plan and to advise industry of the status of the recommendations. SATOPS information will also be available on the Transport Canada Civil Aviation Website at <http://www.tc.gc.ca/aviation>

To show our commitment to this safety initiative, Transport Canada has set a goal to reduce the Air Taxi accident five year average by one half by the year 2005. This can only be done with the full and active participation of everyone in the Air Taxi industry; owners, managers, all operational personnel, air operator associations, the insurance industry, air operator clients, NAV CANADA, the Transportation Safety Board and Transport Canada.

I challenge you to participate and to share in our commitment in achieving this goal.



Art LaFlamme  
Director General  
Civil Aviation

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The Safety of Air Taxi Operations (SATOPS) Task Force was established in January 1996 following a review of accident data from 1990 through 1995 by Transport Canada Safety and Security senior management. This data indicated that the vast majority of commercial aircraft accidents involve Air Taxi aircraft and that the number of fatal accidents was not improving. For the purposes of this project, Air Taxi aircraft are helicopters and fixed-wing aircraft, excluding jets, operated in a commercial air service carrying 9 or fewer passengers or conducting aerial work. There are approximately 1040 Air Taxi operators currently operating in Canada.

Partnership between Transport Canada and the aviation industry was critical to the success of this safety initiative. The joint Transport Canada/aviation industry SATOPS Task Force comprised representatives from the Commercial and Business Aviation, System Safety, and Airworthiness branches of Transport Canada Safety and Security. In addition, the Air Transport Association of Canada, the Alberta Aviation Council, the Canadian Seaplane Pilots Association, the Helicopter Association of Canada and the Northern Air Transport Association were represented.

The Task Force reported to a Steering Committee composed of senior Transport Canada Civil Aviation officials and chaired by the Director General, Civil Aviation. An Executive Advisory Committee comprised of distinguished members of the aviation community was established to give the Task Force an additional industry perspective and to provide oversight for the implementation of the Task Force recommendations.

The SATOPS Task Force "Terms of Reference" is reprinted in Appendix A. Membership of the SATOPS Task Force and the Executive Advisory Committee is outlined in Appendix B.

## **OBJECTIVE**

The objective of the Task Force was to propose ways to improve the safety record of the Air Taxi segment of the aviation industry and to address the outstanding Transportation Safety Board recommendations that impact Air Taxi operations.

## **METHODOLOGY**

The SATOPS Task Force used several information gathering techniques: industry consultation meetings; information about the SATOPS project including a feedback function was established on the Transport Canada Civil Aviation Website; a questionnaire was distributed at the industry meetings; a toll-free telephone "hotline" was established; and a feedback document was distributed to industry. The intent was to make it as easy as possible for as many people as possible involved in the Air Taxi industry to make their views and concerns known to the Task Force.

The Task Force met with Air Taxi operators, pilots and Aircraft Maintenance Engineers in 34 industry consultation sessions across Canada to:

- identify the culture or attitudes that are evident in the Air Taxi sector of the industry and/or identifiable geographic areas;
- work with the aviation industry to clearly define the problems, seek solutions and resolve issues in an open and consultative forum;
- identify safety practices that are being applied by individual air operators and that can be shared with and utilised by other air operators;
- review the air operator/client relationship;
- determine the effectiveness of the Transport Canada, Safety and Security inspection and audit program from both the Transport Canada and the air operator perspective;
- determine how to improve the communication of safety related concerns between Transport Canada Safety and Security and the aviation industry; and
- recommend ways to address the identified problems.

Alexander and Alexander (Reed Stenhouse) fully supported the SATOPS initiative. Representatives from the company provided the insurance industry's perspective in the industry consultation sessions. Locations and dates of these meetings are listed in Appendix C.

Following the industry consultation sessions, the input from the meetings, the mailed-in comments, and the information gathered from the "hotline" and the Internet was consolidated and categorized. The Task Force drafted an interim report containing the findings from the industry meetings and interim recommendations.

The interim report was distributed to various branches of Transport Canada, NAV CANADA and the Transportation Safety Board for review and comment. Some of those concerned provided preliminary feedback to several of the findings and recommendations, while others preferred not to provide any feedback until a full detailed analysis could be conducted. This analysis would not take place until after the release of the final report, hence, during the implementation phase of the project. The implementation phase of the project will include all official responses and an action plan.



A SATOPS Feedback booklet containing a summary of the comments gathered in the industry consultation sessions was sent to all commercial pilots, Aircraft Maintenance Engineers and Air Taxi operators. This booklet contained information about the project, requested comments about safety concerns or safety programs that the person or person's company followed, and outlined industry's perspective and safety concerns. The potential benefit of this, is to start people thinking about their own operating practices and judge their own safety-mindedness. Feedback received from industry was also used to validate the observations made in the industry consultation sessions.

### **NEXT STEPS**

Many important parts of the SATOPS project have been completed. The industry consultation sessions were the first step in opening the lines of communication between industry and Transport Canada. The Task Force was met with overwhelming support for the project as participants in the meetings expressed their desire for continuing meetings of this type. The value of open dialogue cannot be overstated. Operating problems and safety concerns must be identified in order to be corrected. When operators, pilots, Aircraft Maintenance Engineers, Air Traffic Services personnel and Transport Canada inspectors meet in an open forum, the industry, the service provider and the regulator can better understand each others' operating practices and problems. The industry, the service provider and the regulator are all involved in a system, a partnership whose aim is to advance aviation safety.

But the project is far from complete.

An in-depth analysis of the findings and recommendations will have to be conducted by Transport Canada, NAV CANADA, and the Transportation Safety Board in order to determine the depth of the problems and develop an action plan as required. Some of the recommendations will involve considerable resources to implement. Others are more straightforward and work can be started almost immediately. The Task Force's objective was to propose ways to improve aviation safety by identifying the culture, attitudes, problems and safety practices in Air Taxi operations. The SATOPS Steering Committee will prioritize the recommendations based on risk assessment and develop an implementation plan. The Executive Advisory Committee will review the implementation plan and serve as Transport Canada's "conscience" to ensure the recommendations, as appropriate, are acted upon.

### **RECOMMENDATIONS**

The Task Force recommendations are aimed at Transport Canada Safety and Security, NAV CANADA, the Transportation Safety Board and the Air Taxi industry. They represent a challenge

to industry in partnership with government to act on the recommendations and be proactive in their approach to aviation safety. In a very competitive environment and under difficult operating conditions, survival is the number one priority for most air operators. Without doubt a safety-minded company must be led by safety-minded individuals. Safety can be generated from the bottom up, but without the full and active participation, leadership and support of management, Air Taxi companies will never consider safety to be the number-one priority.

The SATOPS Task Force recommendations are divided into thirteen general categories: Airworthiness, Client Pressures, Communication, Decision Making/Human Factors, Flight Training Units, Management, Navigation, Operating Pressures, Operating Problems, Statistics, Training, Transport Canada, and Weather. "SR" denotes SATOPS Recommendation and in some cases there is a corresponding "IA" for recommended Industry Action. A report on the status of the SATOPS recommendations will be published semi-annually.

### **SATOPS TASK FORCE RECOMMENDATIONS**

Note: These recommendations are based on user perceptions gathered throughout the consultative process. An in-depth analysis will be required during the implementation phase of this project.

#### **AIRWORTHINESS**

- SR 1 Recommend Transport Canada provide air operators with feedback about the status and action taken when a Service Difficulty Report (SDR) is submitted.
- IA 1 Recommend air operators request follow-up of SDRs from their Transport Canada regional or district office.
  
- SR 2 Recommend Transport Canada verify that all air operators and Approved Maintenance Organizations are complying with the mandatory SDR program required by Canadian Aviation Regulation (CAR) 591.
- IA 2 Recommend air operators review their Maintenance Manuals to ensure compliance with CAR 591.
  
- SR 3 Recommend Transport Canada provide Aircraft Maintenance Engineers (AME) and air operators with information about fatigue, the effects of fatigue, and fatigue countermeasures.
- IA 3 Recommend air operators provide AMEs and apprentices with information about fatigue, the effects of fatigue and fatigue countermeasures and consider the negative effects of fatigue when assigning work and planning work schedules.

- SR 4 Recommend Transport Canada initiate a Canadian Aviation Regulation Advisory Council (CARAC) review to determine if AME duty times should be regulated, and if so, determine appropriate limitations.
- IA 4 Recommend air operators, air operator associations, AMEs and AME associations participate in or provide input to the CARAC AME duty time working group.
- SR 5 Recommend Transport Canada develop a standard for initial and recurrent aircraft type training for Aircraft Maintenance Engineers.
- SR 6 Recommend Transport Canada ensure Service Bulletins (SB), Airworthiness Directives (AD) and associated diagrams are clearly written and understandable.
- IA 6 Recommend air operators submit an SDR to Transport Canada when they identify problems related to the legibility of SBs, ADs or associated diagrams.
- SR 7 Recommend Transport Canada review its policies for certification of parts and Supplemental Type Certificates to reduce the length of time required for processing the approval.

#### **CLIENT PRESSURES**

- SR 8 Recommend Transport Canada, in association with the aviation industry, review and update promotional material to educate clients about human factors and safety issues and distribute information about how clients can identify safety-minded air operators.
- IA 8 Recommend air operator associations participate in the review of promotional material aimed at educating clients, and produce and distribute information to their member air operators.
- SR 9 Recommend Transport Canada amend the Company Aviation Safety Officer course and Air Taxi client briefings to include a module on client education and customer relations.
- SR 10 Recommend Transport Canada organize and facilitate sessions where air operators can meet as a group to take an active role in fostering a safety culture and encouraging safe operating practices, discuss common problems and arrive at industry-made solutions in cooperation with Transport Canada. Once the group is established, Transport Canada's role would diminish as the group becomes self-sufficient.
- IA 10 Recommend air operators actively participate in the Transport Canada/air operator group sessions.
- SR 11 Recommend Transport Canada make funding or other assistance available for air operators who are establishing safety associations or programs.

**COMMUNICATION**

- SR 12 Recommend Transport Canada review the capabilities of existing Very High Frequency (VHF) repeater stations (Highways, Forestry, Coast Guard, etc.) to determine if additional VHF frequencies could be installed to improve communications, especially the dissemination of weather information.
- SR 13 Recommend Transport Canada publish an article in the Aviation Safety Letter and Aviation Safety Vortex newsletters to remind pilots to eliminate unnecessary conversation on common VHF frequencies.
- IA 13 Recommend pilots exercise good airmanship by eliminating unnecessary conversations on common VHF frequencies.
- SR 14 Recommend Flight Service Station (FSS) Specialists, on initial contact with the pilot, give traffic information first followed by the balance of the required information, and if the pilot advises that he has the information, i.e. the wind, altimeter, and active/preferred runway, the FSS Specialist should relay only the traffic information.
- IA 14 Recommend pilots inform FSS on initial contact that they have the "numbers".
- SR 15 Recommend NAV CANADA assign a new high altitude enroute frequency and designate 126.7 as a low altitude enroute frequency to reduce frequency congestion.
- SR 16 Recommend Transport Canada allocate additional frequencies for Aerodrome Traffic Frequencies to reduce the overlap of transmissions between aerodromes and relieve the congestion and interference on the designated frequency.
- SR 17 Recommend that maintenance vehicles at uncontrolled aerodromes be equipped with VHF radios and vehicle operators be trained to provide vehicle-aircraft conflict information and runway condition information where no other service is available.
- SR 18 Recommend Transport Canada publish an article in the Aviation Safety Letter and Aviation Safety Vortex newsletters to remind pilots, when making a position report, to refer to a local geographic point only if it is published on a visual flight rules (VFR) chart or in the Canada Flight Supplement (CFS).
- IA 18 Recommend pilots refer to a local geographic point when making position reports only if it is published on a VFR chart or in the CFS.

- SR 19 Recommend NAV CANADA publish an article in the Aviation Safety Air Traffic newsletter reminding controllers that they should not request a pilot to report over a local geographic point unless it is published on a VFR chart or in the CFS.
- SR 20 Recommend NAV CANADA promote the benefits of having Community Aerodrome Radio Station Observers/Communicators in northern aerodromes where the service is not presently established.

### **DECISION MAKING/HUMAN FACTORS**

- SR 21 Recommend Transport Canada System Safety regional offices tailor Decision Making/Human Factors courses to meet the specific needs of air operators and specific types of operations.
- IA 21 Recommend air operator management attend Decision Making/Human Factors courses and support pilots, AMEs and apprentices in attending these courses.
- SR 22 Recommend Transport Canada make Decision Making/Human Factors course material available in alternate media such as video tapes.
- SR 23 Recommend Transport Canada review the Commercial Air Service Standard authorizing operations in reduced visibility, provided the pilot has taken a Pilot Decision Making (PDM) course, to determine if a one-time attendance at the PDM course is sufficient.
- IA 23 Recommend air operators not pressure pilots to operate in marginal weather conditions and support the pilot's decision to wait for suitable weather before departing or to turn around when the weather deteriorates, etc. Recommend pilots stop pushing the weather.

### **FLIGHT TRAINING UNITS**

- SR 24 Recommend industry associations and flight training units promote VFR Air Taxi flying as a career at the high school level, specifically targeting northern or remote communities.
- IA 24 Recommend air operators hire high school students to work in the summer to gain experience in Air Taxi operations.
- SR 25 Recommend flight training units emphasize to commercial students the importance of learning and maintaining VFR navigation skills without the use of electronic navigation aids.
- SR 26 Recommend Transport Canada develop a standard for human factors and decision making training. This training should start as early as possible and continue throughout the curricula of flight training units, aviation colleges and AME programs.

## **MANAGEMENT**

- SR 27 Recommend Transport Canada provide the Chief Pilot and Operations Manager on initial appointment to that position with information about courses and training materials available from System Safety (e.g. Decision Making/Human Factors, Company Aviation Safety Officer course, etc.)
- SR 28 Recommend Transport Canada encourage Air Taxi operator management to attend the Company Aviation Safety Officer (CASO) course.
- IA 28 Recommend Air Taxi operator management attend the CASO course and implement the principles learned in the course in their company.
- SR 29 Recommend Transport Canada promote the benefits of having a company safety program to Air Taxi operator management and review the requirement for Air Taxi operators to have a company safety program.
- IA 29 Recommend Air Taxi operators establish a company safety program that is fully supported by management.
- SR 30 Recommend the Transportation Safety Board evaluate the management factors that contributed to the accident during the accident investigation.

## **NAVIGATION**

- SR 31 Recommend Transport Canada continue to publish articles in the Aviation Safety Letter and Vortex newsletters about the safe, proper use of Global Positioning System (GPS) and the hazards associated with its misuse.
- IA 31 Recommend air operators inform their pilots about the operating limitations and company limitations of GPS equipment. Recommend pilots be aware of and respect the operating and company limitations of GPS and practice good airmanship by having back-up navigation equipment tuned and identified and by referencing maps when operating VFR.
- SR 32 Recommend Transport Canada promote the practice of using offset GPS tracks or other means to reduce the potential for conflict between opposite direction traffic on the same route and altitude.
- IA 32 Recommend pilots make position reports, monitor appropriate VHF frequencies and remember that they are responsible to see and avoid other traffic when flying in Visual Meteorological Conditions (VMC).

- SR 33 Recommend NAV CANADA revise VFR navigation charts to include more detailed topographical information.
- SR 34 Recommend Transport Canada notify the Canada Map Office that the accounting procedure for chart dealers has caused some to stop offering the service, resulting in diminished availability of current charts.

### **OPERATING PRESSURES**

- SR 35 Recommend that air operators and pilots not be told of the patient's critical condition prior to or during a MEDEVAC flight, only cabin requirements, such as temperature or cabin altitude, should be discussed.
- SR 36 Recommend Transport Canada promote awareness of the Canada Labour Code, Part II and the Occupational Safety and Health (OSH) regulations to the aviation industry.
- IA 36 Recommend air operators and pilots educate themselves on the Canada Labour Code, Part II and the OSH regulations.
- SR 37 Recommend Transport Canada investigate a means to require air operators to remunerate pilots in a way that eliminates the operating pressures associated with the method of payment.
- IA 37 Recommend air operators and pilots acknowledge the negative effect that the "pay-by-the-mile" method of payment can have on safe operational decision making. Recommend air operators and pilots make decisions based on safety, not remuneration and that air operators consider other methods of remunerating pilots.

### **OPERATING PROBLEMS**

- SR 38 Recommend the Government of Newfoundland and Transport Canada Aerodrome Standards, Atlantic Region be notified of the concerns raised about the need for an additional windsock at Nain, Labrador.
- SR 39 Recommend Transport Canada and NAV CANADA review the requirement for VFR routes for aircraft transiting around or through Terminal Control Areas.
- SR 40 Recommend Transport Canada, in cooperation with the Federal Aviation Administration, produce Canada/U.S. differences cards updated with the new Canadian Aviation Regulations requirements.

- SR 41 Recommend Transport Canada contact the federal and provincial environment authorities to determine if they are misinformed about the proper storage practices for fuel drums and advise them of the safety-related requirements for air operators to have fuel caches.
- SR 42 Recommend Transport Canada, in cooperation with fuel suppliers, publish information for pilots and AMEs on proper fueling practices from fuel caches.
- SR 43 Recommend Transport Canada review the Automatic Terminal Information Service / Aircraft Radio Control of Aerodrome Lighting unit that is being tested by the British Columbia Aviation Council for alerting pilots to blasting operations to determine if this technology can be used to alert pilots to areas where avalanche control and other blasting operations are being conducted.
- SR 44 Recommend that VFR charts note areas of avalanche control activity.
- SR 45 Recommend Transport Canada request the Department of National Defense (DND) publish a telephone number in the Canada Flight Supplement for civilian pilots to report near mid-air collisions with military aircraft.
- IA 45 Recommend pilots report near mid-air collisions with military aircraft to a Flight Service Station Specialist or Air Traffic Controller until the DND telephone number is established.
- SR 46 Recommend Transport Canada advise the provincial and territorial Ministry of Natural Resources fire centres of the requirement for pilots to be provided with suitable accommodation.
- IA 46 Recommend air operators ensure their clients are aware of the requirement for pilots to be provided with suitable accommodation and ensure their clients provide pilots with suitable accommodation.
- SR 47 Recommend Transport Canada advise the Manitoba Government of the concerns raised about the length of the runways at community aerodromes in northern Manitoba and that visual reference on approach would be enhanced if the aerodromes were equipped with a Precision Approach Path Indicator (PAPI) or a Visual Approach Slope Indicator (VASI).
- SR 48 Recommend Transport Canada initiate research and development into a less expensive, remote PAPI or VASI system.



**STATISTICS**

- SR 49 Recommend Transport Canada require Air Taxi operators to submit relevant statistics to determine where accidents are occurring and to target areas where resources should be allocated for accident prevention programs.
- SR 50 Recommend Transport Canada review relevant databases, such as the Canadian Aviation Daily Occurrence Reporting System (CADORS) and the Aviation Safety Information System (ASIS) to determine that they contain meaningful data and that suitable quality control is in place.
- SR 51 Recommend the Transportation Safety Board inform air operators that it can provide statistics as required.

**TRAINING**

- SR 52 Recommend Transport Canada develop a brochure outlining underwater egress procedures that air operators can provide to their passengers and clients.
- IA 52 Recommend float-plane pilots and helicopter pilots operating over water include information on underwater egress procedures in the passenger briefing.
- SR 53 Recommend Transport Canada develop various modules of the surface contamination training program that are relevant to specific types of VFR operations, such as Air Taxi, Aerial Work operations and helicopters.
- SR 54 Recommend Transport Canada advertise safety courses, safety programs and safety information (brochures, videos, etc.) on the System Safety Website and in the various Aviation Safety newsletters.
- IA 54 Recommend air operators, pilots and AMEs attend safety courses and distribute the information to other employees. Recommend air operators support their employees' participation in these courses.
- SR 55 Recommend Transport Canada include safety quizzes in the various Aviation Safety Letters targeting new or amended procedures and regulations to provide the aviation industry with a more interesting way of learning.

**TRANSPORT CANADA**

- SR 56 Recommend Transport Canada facilitate information sessions to provide a forum for the exchange of ideas and information between Transport Canada and the Air Taxi industry.

- IA 56 Recommend air operators, pilots, AMEs, Air Traffic Control/Flight Service Station personnel actively participate in these sessions. Recommend air operators support their employees' participation in these sessions.
- SR 57 Recommend Transport Canada establish a confidential reporting system for safety concerns and regulatory infractions modeled after the National Aeronautics and Space Administration (NASA) Aviation Safety Reporting System (ASRS).
- SR 58 Recommend Transport Canada conduct more operations-oriented audits and inspections.
- SR 59 Recommend Transport Canada conduct in-flight inspections in Air Taxi aircraft.
- SR 60 Recommend Transport Canada conduct more random audits and inspections.
- SR 61 Recommend Transport Canada provide more regulatory compliance presence, especially in northern and remote areas.
- SR 62 Recommend Transport Canada ensure all audit follow-up is completed.
- IA 62 Recommend air operators ensure all audit findings are rectified.
- SR 63 Recommend Transport Canada Regional Commercial and Business Aviation inspector personnel are more representative of the demographics of the aviation industry.
- SR 64 Recommend Transport Canada establish a conflict resolution program where members of the aviation industry can confidentially report problems with individual Civil Aviation inspectors.
- SR 65 Recommend Transport Canada publish on the Internet and in hard copy an inventory of exemptions that have been issued to air operators.
- SR 66 Recommend Transport Canada analyse all exemptions issued to air operators to determine if any should be revoked and the conditions of those exemptions included in the Canadian Aviation Regulations or Canadian Aviation Regulations Standards.
- SR 67 Recommend Transport Canada continue to promote in the Aviation Safety Vortex newsletter the safety benefits of helicopter pilots wearing helmets, especially in aerial work operations, and promote flight training units to encourage student pilots to wear helmets.

- IA 67 Recommend that helicopter air operators, especially aerial work operators, encourage their pilots to wear helmets, that commercial helicopter pilots wear helmets and that flight training units encourage student helicopter pilots to wear helmets.
- SR 68 Recommend Transport Canada promote customer education to encourage passengers who have protective headgear to wear it while in the helicopter.
- IA 68 Recommend air operators and pilots encourage passengers who have protective headgear to wear it while in the helicopter.

### **WEATHER**

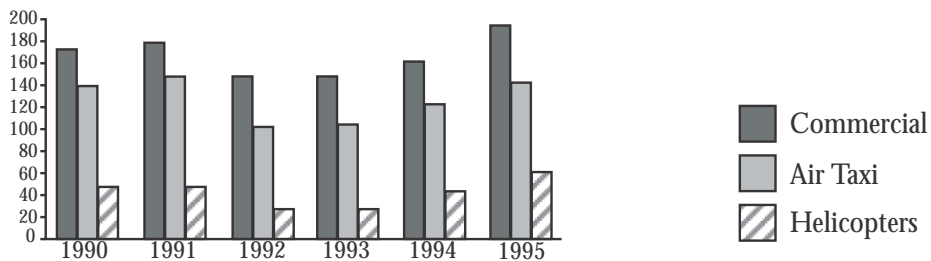
- SR 69 Recommend Transport Canada consult with the British Columbia Air Operators Group and NAV CANADA to determine what is being done to improve the weather reporting services on the west coast of British Columbia. A safety review of the issues would be justified if there is no obvious and timely solution to these problems.
- SR 70 Recommend NAV CANADA publish Canadian weather information, notices to airmen (NOTAMS) and provide flight planning capability on the Internet.
- SR 71 Recommend Transport Canada Commercial and Business Aviation and Flight Training Standards inspectors and flight instructors promote the benefits of filing PIREPs and that Transport Canada publish an article in the Aviation Safety Letter and Aviation Safety Vortex newsletters encouraging pilots to file PIREPs.
- IA 71 Recommend pilots file PIREPs especially in areas of variable weather conditions and where weather reporting is less available or reliable.



## BACKGROUND

Concern about the large number of accidents in the Air Taxi industry motivated Transport Canada to initiate the SATOPS project. Relative to Airline and Commuter operations, Air Taxi aircraft are involved in the vast majority of accidents each year. Transport Canada System Safety generates an annual Canadian Aviation Safety Statistics report based on Transportation Safety Board accident statistics. The reports from 1990 to 1995 revealed that the number of accidents had not decreased and the number of fatal accidents had increased.

The following graph illustrates the proportion of Air Taxi accidents relative to the total number of accidents in commercial operations during 1990 - 1995. The first column in each year represents the total number of accidents in all commercial operations. The second column represents the number of helicopter and fixed-wing Air Taxi accidents. The third column represents the number of helicopter accidents (included in the second column) for comparison purposes. In 1990, 82% of all commercial aircraft accidents involved Air Taxi aircraft, 83% in 1991, 69% in 1992, 72% in 1993, and 79% in 1994 and 1995.



The following tables show the number of fatal accidents and fatalities in Air Taxi operations and the percentage relative to the total number of fatal accidents and fatalities in all commercial operations for fixed-wing aircraft and helicopters from 1990 through 1995.

### FATAL ACCIDENTS AND FATALITIES - FIXED WING AIRCRAFT

YEAR	FATAL ACCIDENTS	% OF TOTAL	FATALITIES	% OF TOTAL
1990	11	92%	20	83%
1991*	16	100%	35	100%
1992	10	100%	20	100%
1993	13	93%	38	84%
1994	15	100%	45	100%
1995	15	94%	40	83%

\* Excluding the accident in Saudi Arabia that claimed 261 lives.

**FATAL ACCIDENTS AND FATALITIES - HELICOPTERS**

<b>YEAR</b>	<b>FATAL ACCIDENTS</b>	<b>% OF TOTAL</b>	<b>FATALITIES</b>	<b>% OF TOTAL</b>
1990	5	100%	18	100%
1991	5	100%	9	100%
1992	3	100%	3	100%
1993	0	0%	0	0%
1994	3	100%	10	100%
1995	8	100%	13	100%

Unfortunately, it is not possible to determine the accident rate for Air Taxi operations since statistics are not available for the number of flight hours or the number of aircraft movements (take-offs and landings). Air Taxi operators are not required to track this information. A reduction in the number of flight hours could have been the reason for an improved accident record in 1992 and 1993. Without relevant data, it is very difficult to determine where the majority of accidents occur. This data is required in order to identify areas to commit resources for accident prevention programs.

Increasing regulation was not considered to be the solution to reducing the accident rate. Disregard for established regulations was cited by the Transportation Safety Board in many of the Air Taxi accident reports. Transport Canada believes that there is a culture or attitude of accepted operating practices that has developed over the years in Air Taxi operations. The Task Force's objective was to propose ways to improve the accident record by identifying the culture, attitudes, problems and safety practices in Air Taxi operations.

Air Taxi operations involve more than just transporting passengers or cargo and are not generally conducted from paved runways. Lakes, ice and snow-covered surfaces, eskers and tundra are typical "runways". Helicopters operate in confined and remote areas that are otherwise inaccessible by air. Aerial spraying, surveying, waterbombing or waterbucketting forest fires, helilogging, heliskiing, and carrying or slinging external loads are examples of Air Taxi operations.

There is considerable competition in the Air Taxi industry as a result of deregulation. Any company able to meet the Transport Canada regulatory requirements can be authorized to operate. This creates significant pressure on air operators, especially smaller operators, to compete for a limited number of clients and contracts. Compounding this is the limited time that operators and pilots have to make money. The majority of hours flown each year occur in the spring through fall when the days are longer and the weather is generally favourable. The tourist industry generates a substantial amount of business for Air Taxi operators who can serve the needs

of fishermen and hunters. Geological exploration increases when the ground is more accessible to specific types of field work.

A fixed-wing pilot's first job is usually with an Air Taxi operator where he gains experience before moving on to larger aircraft with commuter companies or the major airlines. Remote working locations and low wages make it difficult to attract highly qualified people. Pilot turnover is high, especially when the economy is strong and the airlines are hiring. Helicopter pilots working in the Air Taxi industry generally have more experience since the opportunity for advancement to airline-type operations is not available. Nonetheless, inexperienced helicopter pilots face the same problem as inexperienced fixed-wing pilots. Clients expect that the pilot will be able to perform any task required of the job. This expectation places subtle and sometimes overt pressure on the pilot that can lead to poor decision making.

### **INDUSTRY CONSULTATION SESSIONS**

The Task Force believed that industry participation was essential to the success of this project. Throughout the project, the Task Force asked industry to "Tell us what you think". The most important and productive approach was the face-to-face industry consultation sessions. In October 1996, Transport Canada regional inspectors from Commercial and Business Aviation and System Safety identified 33 locations for the meetings. The locations were chosen based on proximity to air operators in an attempt to get a good turnout at the meetings. Transport Canada Airworthiness inspectors were invited to take part in the industry meetings to round out the Task Force. In December 1996, two Transport Canada System Safety inspectors and a human factors specialist were trained in facilitation techniques to maximize participation by the audience. At the same time the format of the meetings was defined.

A flyer advertising the meetings was mailed to commercially-licensed fixed-wing and helicopter pilots, and Aircraft Maintenance Engineers. The various industry associations represented on the Task Force also promoted the meetings to their members. A poster advertising the meetings was sent to all Flight Service Stations with the request to post it in a conspicuous location for itinerant pilots to see. Industry participation at the meetings ranged from 4 to 70 people and approximately 660 people attended the meetings. The Task Force received excellent input from the participants even at those meetings that were less well attended.

Each meeting began with a welcome and description of the SATOPS process. Basic national and regional statistical summaries of commercial accidents from 1990 through 1995 were presented. At all meetings, except Dorval (English) and Iqaluit, a representative from Alexander and Alexander (Reed Stenhouse) spoke about the insurance industry's support for the SATOPS project, outlined the philosophy underlying the insurance industry's approach to aviation, and stressed the importance

of the air operators communicating their safety initiatives to their insurance broker to ensure they get the best possible rate. Often, if the air operator is providing its flight crews with additional training, such as simulator training, or providing them with other safety related training or programs, the annual insurance premium may be reduced.

The facilitator then presented a model of human error, emphasizing that an accident is not a discrete event, but is the product of a process that may originate well before the accident occurred. Most accidents can be traced to an unsafe act or unsafe condition. Analysis of these unsafe acts and conditions usually reveals that they existed prior to the accident flight or their occurrence can be accounted for by background factors such as: training, experience, operating pressures, communications, prevailing practices, decision making, management, or costs. These background factors were presented in the industry consultation sessions to stimulate discussion, however, the list was not intended to be exhaustive.

The meeting was then opened to the audience. In most cases participation started slowly, but the discussion gathered momentum as the meeting progressed. The facilitators did not make judgments on the quality of the ideas, but instead tried to make sure that all present agreed on the definition of the issues. When solutions were offered, they were recorded as actions that Transport Canada could undertake or that industry could assume.

Each participant was given a questionnaire that requested feedback on the benefit of the meeting and requested comments on safety issues. Respondents were encouraged to comment on issues raised at the meeting, and raise any new issues that crossed their minds after the meeting or concerns that they were not comfortable speaking openly about at the meeting. Feedback forms were given to the Task Force at the meeting or mailed, postage paid, to the SATOPS Task Force. Participants were also encouraged to take the questionnaires to people who could not attend the meeting but would like to comment on any safety issue of concern to them. A total of 230 questionnaires were submitted to the Task Force.

### **INTERIM REPORT AND VALIDATION OF FINDINGS**

Summary records were taken highlighting the issues discussed and the solutions generated by the participants. When the information gathering phase was completed, the Task Force met in Ottawa in March 1997 to consolidate and categorize the input from the meetings, mail-in comments, phone calls and Internet inputs. The Task Force used the issues and the proposed solutions to develop recommendations and an outline of the body of the interim report. In order to ensure transparency and an unbiased point of view, it is important to note that at this stage, the issues and the proposed solutions have not been subjected to a detailed analysis. Not all concerns raised in the



industry consultation sessions generated a recommendation. However, all of the comments were provided to the appropriate branch of Transport Canada, NAV CANADA and the Transportation Safety Board for information and possible action.

The SATOPS Terms of Reference (see Appendix A) stated that the final report would be published by March 31, 1997. At the Steering Committee meeting held on March 20, 1997, it was agreed that the final report would be of more value if the Task Force findings and recommendations were distributed to various branches within Transport Canada, NAV CANADA, and the Transportation Safety Board for review, and if deemed appropriate at this stage, for response. Some of those concerned provided preliminary feedback to several of the findings and recommendations, while others preferred not to provide any feedback until a full detailed analysis could be conducted. This analysis would not take place until after the release of the final report, hence, during the implementation phase of the project. The implementation phase of the project will include all official responses and an action plan.

To validate the findings of the SATOPS Task Force with the Air Taxi industry, all commercial pilots, Air Taxi operators and Aircraft Maintenance Engineers received a booklet entitled "SATOPS Feedback" in September 1997. This booklet contained background information about the SATOPS project but most importantly it contained the comments and concerns expressed by industry during the consultation sessions. This feedback to industry was an important part of the project, especially for those people who attended a meeting and expressed concern that the project would falter as do many government initiatives. It provided people who attended a consultation session with an update on the progress of the Task Force and with information about the comments and concerns expressed in the other meetings across Canada. For people who were unable to attend a meeting, it provided information about the project and an opportunity to comment to the Task Force. To date, 457 responses have been received. This feedback confirms the comments and observations that were made in the industry meetings.

The Task Force was not just interested in hearing about the operating problems and safety concerns from the Air Taxi industry. Many companies and individuals are quite proactive about safety even though company safety programs are not a regulatory requirement for Air Taxi operations. The Task Force wanted to hear what people do to promote safe operations in their company.

Here are some of the comments received:

- Regular pilot/management meetings where anything is up for discussion.
- We do not take any "shortcuts" as far as maintenance and repairs to our aircraft are concerned.
- I will not let deadlines, etc. affect my weather go-no go decision.
- Our company has embarked on a safety program emphasizing 4 crucial building blocks:

- Hire the right people - references, attitude.
  - Employee orientation - tell employees what the company expects.
  - Training - emphasis on safety aspects of training
  - Better operational control through two-way communication.
- 
- Avoid complacency with GPS navigation - new hires only allowed to use maps.
  - Personal salary based on experience - not mileage!
  - Legal loads only - extra cargo taken in another aircraft results in more revenue.
  - Encourage attendance at safety seminars and reading of safety material.
  - New low-time pilots are only allowed to fly good weather, light load trips.
  - All pilots encouraged to discuss any safety problems, but the brass has to be in tune.
  - Company safety meetings and maintenance Quality Assurance meetings are held regularly.
  - Our company has ongoing human factors training. As well, they are trying to change the "competitive attitude" among the pilots by equalizing flight assignments, instituting daily minimum flight pay for some of the less desirable jobs.
  - My company keeps its aircraft in tip top condition which helps promote employee pride and team spirit.
  - When it comes to safety in a small company - it's all in hiring people with the right attitude. Attitude is more important than hours in the log.
  - Management supported "Do not feel right - not flying decisions".
  - Safety awards (usually trips) are given for suggestions for safer operations as well as monetary awards for years of accident-free service.
  - My company has included PDM training, inadvertent IMC training and expanded safety awareness training for all employees.
  - I teach my students the importance of following the regulations and respecting their own limitations.

Many of the Task Force recommendations are concerned with communication. Communication between Transport Canada and the industry. Communication between pilots of the same and of other companies. Communication within the company: owner; president; operations manager; chief pilot; line pilots; AMEs; dispatchers; swamper; etc. Communication between air operators. Communication between the air operator's management and pilots and their customers. Open communication is necessary to identify concerns and problems and promotes the climate necessary for candid observations, suggestions and solutions.

Company management has to be convinced of the benefits of operating safely. Increased profitability is certainly an incentive for any business. Promoting safety and subsequently decreasing the number of incidents does increase the bottom line. Management's commitment to safe operating practices is essential to the long term viability of the company. Consider the added costs of an incident or accident - costs to repair the aircraft, down time when the aircraft isn't being used to generate revenue, down time for the pilot who isn't generating revenue for himself or the company, increased insurance rates, loss of goodwill of the customers, demoralized staff, etc. When the fully allocated costs of an incident or accident are tallied, it is clear that safety really is good business.

When an accident occurs, often the pilot is the only one held accountable. While the pilot may be at fault for having made a poor decision or series of decisions that led to the accident, other questions have to be asked...Were there any systemic problems in the company? What was management's role in the accident? What did management do to prevent the accident? What is management doing to prevent a recurrence? Management must be accountable for the safety of the day-to-day operations. When management is held responsible for an accident, they will become more proactive in promoting safe operating practices.

### **NEXT STEPS**

The Steering Committee will develop an implementation plan to prioritize the recommendations. To optimize the results, Transport Canada, NAV CANADA and the Transportation Safety Board will have to conduct a review of the industry observations and the Task Force recommendations. This will include a detailed analysis and the determination of the resources required to address the recommendations. The Task Force did not attempt to do a risk analysis of the information gathered in this project since the objective was to identify industry's attitudes and propose ways of improving the safety record in Air Taxi operations. Resolution of some of the recommendations is already in progress. Some of the recommendations will involve the commitment of significant resources. The Steering Committee's implementation plan will be reviewed by the Executive Advisory Committee who will oversee the implementation of the recommendations, as appropriate.

The Task Force was told on many occasions that the industry consultation sessions were a significant first step in addressing the problems concerning the industry. Many participants were concerned that the project would not continue. The Task Force believes it is essential to continue to have informal meetings involving Transport Canada and industry in the spirit of cooperation and partnership. Updates on the status of the recommendations will be published semi-annually to keep industry informed about the progress of the SATOPS project.



**COMMENTARY AND SATOPS TASK FORCE RECOMMENDATIONS**

The recommendations are preceded by a commentary reflecting issues that were identified by industry or Transport Canada.

As stated in the Executive Summary, “SR” indicates a SATOPS Recommendation and “IA” indicates a corresponding Industry Action. The “IAs” represent a challenge to industry in partnership with Transport Canada to act on the recommendations and become proactive in their approach to safety. The purpose of the SATOPS project was to identify the Air Taxi industry’s attitude toward operating practices and propose ways to reduce the number of accidents. Transport Canada should also take this opportunity to review its own policies and procedures.

Note: These recommendations are based on user perceptions gathered throughout the consultative process. An in-depth analysis will be required during the implementation phase of this project.

**AIRWORTHINESS**

Operators who submit Service Difficulty Reports (SDR) are not satisfied with the feedback they receive from Transport Canada. Typically, they receive only a notice that the SDR has been received with no indication of how often this SDR has been submitted or the action being taken by Transport Canada. Conversely, operators are not submitting SDRs for each occurrence, especially if they are experiencing continued difficulty with a specific part and manufacturer. This may be as a result of the operators losing faith in the SDR system. For the system to work properly, the SDRs to be tracked and the service difficulty rectified, operators must submit an SDR for each occurrence and Transport Canada must follow up on the SDR and provide feedback to the operator. Commercial aircraft operators and Approved Maintenance Organizations (AMO) are subject to the mandatory SDR program required by Canadian Aviation Regulation (CAR) 591. Due to the number of changes brought about by the CARs, some operators or AMOs may be unaware of this requirement. Operators may not be aware that the data collected by the SDR program is available from regional and district Transport Canada offices or on the SDR Bulletin Board Service.

*SR 1 Recommend Transport Canada provide air operators with feedback about the status and action taken when an SDR is submitted.*

*IA 1 Recommend air operators request follow-up of SDRs from their Transport Canada regional or district office.*

*SR 2 Recommend Transport Canada verify that all air operators and Approved Maintenance Organizations are complying with the mandatory SDR program required by CAR 591.*

*IA 2 Recommend air operators review their Maintenance Manuals to ensure compliance with CAR 591.*

Aircraft Maintenance Engineers (AME) work long hours and often work shifts or at night when the aircraft are available. There are currently no limits to the amount of time an AME can work, unless the AME is also working as a pilot for an air operator. In that case, time spent conducting maintenance duties must be considered in the flight duty time limitations. Individuals who are fatigued can commit errors of omission that can have a negative impact on the airworthiness of the aircraft. These errors of omission have often been cited as a factor in the "chain of events" that led to an accident or incident. Regulation of AME duty times has been considered by Transport Canada in the past but it was decided that regulation could in some cases increase the risk of errors of omission. However, in response to the comments received, the Task Force believes it is timely for this issue to be the subject of a review that includes all stakeholders.

*SR 3 Recommend Transport Canada provide AMEs and air operators with information about fatigue, the effects of fatigue, and fatigue countermeasures.*

*IA 3 Recommend air operators provide AMEs and apprentices with information about fatigue, the effects of fatigue and fatigue countermeasures and consider the negative effects of fatigue when assigning work and planning work schedules.*

*SR 4 Recommend Transport Canada initiate a Canadian Aviation Regulation Advisory Council (CARAC) review to determine if AME duty times should be regulated, and if so, determine appropriate limitations.*

*IA 4 Recommend air operators, air operator associations, AMEs and AME associations participate in or provide input to the CARAC AME duty time working group.*

Currently there is no standard for initial or recurrent training required for Aircraft Maintenance Engineers nor a requirement for recording or reporting if training has occurred. An AME can work on an aircraft that he has had no experience on as long as his licence is valid for that class of aircraft.

*SR 5 Recommend Transport Canada develop a standard for initial and recurrent aircraft type training for Aircraft Maintenance Engineers.*

Safety related information can be misinterpreted if it is difficult to understand. Notices to Aircraft Maintenance Engineers such as Service Bulletins (SB), Airworthiness Directives (AD) and all associated diagrams should be written simply and clearly.

*SR 6 Recommend Transport Canada ensure Service Bulletins (SB), Airworthiness Directives (AD) and associated diagrams are clearly written and understandable.*

*IA 6 Recommend air operators submit an SDR to Transport Canada when they identify problems related to the legibility of SBs, ADs or associated diagrams.*

Air operators find that Transport Canada's certification process for aircraft parts and supplemental type certificates (STC) is extremely lengthy. This delay in service is costly for operators who are waiting for the certification.

*SR 7 Recommend Transport Canada review its policies for certification of parts and STCs to reduce the length of time required for processing the approval.*

### **CLIENT PRESSURES**

Operating pressures from clients may be subtle or overt. Some clients may be unaware that they are pressuring the operator and/or pilot to either start or continue a flight. They may also be unaware of what constitutes an unsafe operating practice and what are the associated risks. Other clients may be well aware of the risks but are willing to accept those risks as required to get the job done.

Operating pressures, whether real or perceived, are induced by clients and the competitive nature of commercial aviation only contributes to the problem. "If you won't take this trip, I'll find someone else who will", whether a real or perceived pressure, influences air operators' and pilots' decision making. Clients should be aware of how they can affect the air operators' and pilots' decision to operate safely or not. For example, split the load and do two flights instead of asking the pilot to overload the aircraft. Wait for the weather to improve instead of pressuring the pilot to take off or continue the flight when the weather is marginal.

Government agencies and other air operator clients often award contracts to the operator who submits the lowest bid. They should understand the potential problem this creates especially in a competitive market where contracts are valued. By undercutting the competition, safety could be compromised if the air operator cuts costs elsewhere to make up for the revenue lost by taking the contract. Reducing the air operators' ability to be profitable creates operating pressures that are passed from the management throughout the company.

Safety-minded air operators should be able to promote themselves to clients and prospective clients. Additional training, company safety programs, or any other information that shows the operator is doing more than the minimum required by regulation could be included with contract bids or as promotional material.

- SR 8 Recommend Transport Canada, in association with the aviation industry, review and update promotional material to educate clients about human factors and safety issues and distribute information about how clients can identify safety-minded air operators.*
- IA 8 Recommend air operator associations participate in the review of promotional material aimed at educating clients, and produce and distribute information to their member air operators.*
- SR 9 Recommend Transport Canada amend the Company Aviation Safety Officer course and Air Taxi client briefings to include a module on client education and customer relations.*

Air operators must create a climate within their company where responsibility is shared among all operational personnel for safe operating practices. Additionally, air operators should work together and not degrade safety by taking a flight that they know their competitor didn't or won't. If air operators agreed to this "operating standard", then clients would not be able to play one air operator against the other. Cooperation between air operators would reduce the competitive pressure, whether real or perceived, that if one air operator won't take the flight, the competition will.

- SR 10 Recommend Transport Canada organize and facilitate sessions where air operators can meet as a group to take an active role in fostering a safety culture and encouraging safe operating practices, discuss common problems and arrive at industry-made solutions in cooperation with Transport Canada. Once the group is established, Transport Canada's role would diminish as the group becomes self-sufficient.*
- IA 10 Recommend air operators actively participate in the Transport Canada/air operator group sessions.*
- SR 11 Recommend Transport Canada make funding or other assistance available for air operators who are establishing safety associations or programs.*

## **COMMUNICATION**

Very High Frequency (VHF) radio communication capability is limited, especially along coastal areas and in mountainous terrain. The reduction in aeronautical services, such as the decommissioning of Flight Service Stations (FSS) and Remote Communication Outlets, has also contributed to this problem. Pilots operating in these areas cannot obtain up-to-date weather information nor relay current weather information to an FSS for the benefit of others.

- SR 12 Recommend Transport Canada review the capabilities of existing VHF repeater stations (Highways, Forestry, Coast Guard, etc.) to determine if additional VHF frequencies could be installed to improve communications, especially the dissemination of weather information.*



Pilots continue to tie up common VHF frequencies (122.8, 126.7) with unnecessary conversation. This precludes other pilots who need to report their position or obtain information relevant to their flight from doing so. Pilots should switch to a discrete frequency when they want to chat to each other. It is poor airmanship to use the common frequency for irrelevant conversation.

*SR 13 Recommend Transport Canada publish an article in the Aviation Safety Letter and Aviation Safety Vortex newsletters to remind pilots to eliminate unnecessary conversation on common VHF frequencies.*

*IA 13 Recommend pilots exercise good airmanship by eliminating unnecessary conversations on common VHF frequencies.*

FSS Specialists broadcast wind, altimeter and runway information to each pilot even if the information has just been relayed to another pilot moments before. This increases congestion on the assigned frequency especially when there is a lot of traffic in the area. If a pilot has already heard the airport information, and tells the FSS Specialist that he has the information, it would decrease congestion on the frequency if the FSS Specialist could relay only the traffic information. Pilots stated that they would also prefer to have the traffic information first, followed by the airport information, since the traffic information is more significant. Requirements contained in the MANOPS document may need to be revised to allow this flexibility.

*SR 14 Recommend Flight Service Station (FSS) Specialists, on initial contact with the pilot, give traffic information first followed by the balance of the required information, and if the pilot advises that he has the information, i.e. the wind, altimeter, and active/preferred runway, the FSS Specialist should relay only the traffic information.*

*IA 14 Recommend pilots inform FSS on initial contact that they have the "numbers".*

Frequency congestion is a problem in areas of high activity and certainly during peak seasonal operations. Pilots are often unable to acquire flight information when they require it because of this congestion. Transmissions from pilots flying at higher altitudes are broadcast over a large area and interfere with transmissions from pilots flying at lower altitudes who are trying to contact another FSS on the same frequency. Generally Visual Flight Rules (VFR) traffic is operating at lower altitudes, most often below 3000 feet above ground level. Aircraft at these lower altitudes would benefit from a distinct radio frequency from that used by aircraft operating at higher altitudes. Pilots crossing the designated altitude would broadcast their position and intentions on the frequency assigned to the area to which they are transitioning. Frequency congestion and interference was also noted as a problem where aerodromes with an Aerodrome Traffic Frequency (ATF) are close together.

*SR 15 Recommend NAV CANADA assign a new high altitude enroute frequency and designate 126.7 as a low altitude enroute frequency to reduce frequency congestion.*

*SR 16 Recommend Transport Canada allocate additional frequencies for ATFs to reduce the overlap of transmissions between aerodromes and relieve the congestion and interference on the designated frequency.*

Where no other service such as FSS, UNICOM, or Community Air Radio Station is available, pilots can contact radio-equipped vehicle operators where there is a mandatory frequency or aerodrome traffic frequency to determine the runway status or the presence of other vehicles or aircraft. Many uncontrolled aerodromes have no services available or the ground station has limited hours of operation. If these services are not available, maintenance vehicle operators who are on site should be able to provide pilots with information about runway conditions, vehicle and aircraft traffic.

*SR 17 Recommend that maintenance vehicles at uncontrolled aerodromes be equipped with VHF radios and vehicle operators be trained to provide vehicle-aircraft conflict information and runway condition information where no other service is available.*

Pilots are broadcasting position reports and controllers are requesting pilots report over geographic points that would be familiar only to local pilots since they are not published on VFR charts nor in the Canada Flight Supplement (CFS). Itinerant pilots are unaware of these reporting points and there is potential for aircraft conflict.

*SR 18 Recommend Transport Canada publish an article in the Aviation Safety Letter and Aviation Safety Vortex newsletters to remind pilots, when making a position report, to refer to a local geographic point only if it is published on a VFR chart or in the CFS.*

*IA 18 Recommend pilots refer to a local geographic point when making position reports only if it is published on a VFR chart or in the CFS.*

*SR 19 Recommend NAV CANADA publish an article in the Aviation Safety Air Traffic newsletter reminding controllers that they should not request a pilot to report over a local geographic point unless it is published on a VFR chart or in the CFS.*

Many communities in remote areas of the Yukon, Northwest Territories and Quebec have established Community Aerodrome Radio Stations. During limited hours of operations, these stations are manned by Observers/Communicators who have been trained to provide flight information, including local weather, altimeter setting, runway conditions, vehicle and aircraft traffic. It is in the community's interest to provide this service since it makes the aerodrome and

consequently the community more accessible to medical evacuation (MEDEVAC) and routine flights. These services should be promoted at more northern aerodromes.

*SR 20 Recommend NAV CANADA promote the benefits of having Community Aerodrome Radio Station Observers/Communicators in northern aerodromes where the service is not presently established.*

### **DECISION MAKING/HUMAN FACTORS**

The Pilot Decision Making (PDM) course offered by Transport Canada System Safety is well received, but only if the course has been tailored for the particular group receiving the training. Many regional offices are providing this service to the industry. Other regional offices do not deliver any type of PDM course. The "standard" course that is available contains out-of-date information and does not meet the needs of the industry. Pilots and operators believe that PDM training can be very beneficial and practical for day-to-day operations. Some even believe that the course should be mandatory for pilots and management. The PDM course content should also be available to operators and pilots in media where they can review the information after having taken the course. Decision making courses for AMEs have recently been developed. Air operators, AMEs and apprentices should contact their regional System Safety office for more information about these courses.

*SR 21 Recommend Transport Canada System Safety regional offices tailor Decision Making/Human Factors courses to meet the specific needs of air operators and specific types of operations.*

*IA 21 Recommend air operator management attend Decision Making/Human Factors courses and support pilots, AMEs and apprentices in attending these courses.*

*SR 22 Recommend Transport Canada make Decision Making/Human Factors course material available in alternate media such as video tapes.*

The Commercial Air Service Standards authorize pilots to operate in reduced visibility conditions if they have attended a PDM course. The association of the one-time PDM course with operations in reduced visibility is not considered to be appropriate, especially with the changing information on human factors and decision making. Many controlled flight into terrain (CFIT) accidents have occurred when the visibility was lower than the minimum allowable and the pilot continued to fly into instrument meteorological conditions (IMC). Pilots are still pushing the weather! The decision to continue flight into deteriorating weather conditions may be caused by operational pressures that the air operator or client are imposing on the pilot, because of pressure the pilot is putting on himself or because flying in marginal VFR conditions, often IMC, has become the accepted way of operating.

- SR 23 Recommend Transport Canada review the Commercial Air Service Standard authorizing operations in reduced visibility, provided the pilot has taken a PDM course, to determine if a one-time attendance at the PDM course is sufficient.*
- IA 23 Recommend air operators not pressure pilots to operate in marginal weather conditions and support the pilot's decision to wait for suitable weather before departing or to turn around when the weather deteriorates, etc. Recommend pilots stop pushing the weather.*

### **FLIGHT TRAINING UNITS**

Air Taxi operations are among the most demanding, requiring high levels of specialized knowledge and skill yet this sector of the aviation industry is populated with large numbers of inexperienced and low-time entry level pilots. These pilots normally require close supervision and a large financial investment by the operator to provide on-the-job training, especially for specialized operations. Often, an operator will not recoup this investment before the pilot departs for the greener pastures of Commuter or Airline operations. High turnover rates result in lower experience levels and a continual drain on an operator's resources. Increased financial pressures on the company and inexperienced pilots can increase the likelihood of incidents or accidents. Some operators demand a performance contract that requires the pilot to stay in the job for a specified period of time or pay for part of the training received. Operators would realize a decrease in initial training costs if the pilot turnover was reduced. Individuals recruited from surrounding communities would be more likely to view Air Taxi operations as a career instead of a stepping stone. If local people were encouraged to pursue an Air Taxi flying career, the pilot turnover should decrease since people who grew up in the area would be more likely to stay. Students could pursue summer jobs with air operators to acquire aviation related experience before they start to fly commercially.

- SR 24 Recommend industry associations and flight training units promote VFR Air Taxi flying as a career at the high school level, specifically targeting northern or remote communities.*
- IA 24 Recommend air operators hire high school students to work in the summer to gain experience in Air Taxi operations.*

Newly licenced commercial pilots coming out of flight schools are not considered to be as proficient at navigation, especially at low altitudes, as commercial pilots used to be. The tendency to train students for IFR flying rather than VFR flying and the reliance on global positioning system (GPS) navigation equipment may be contributing to the diminished skill.

- SR 25 Recommend flight training units emphasize to commercial students the importance of learning and maintaining VFR navigation skills without the use of electronic navigation aids.*

Human Factors and PDM training should be introduced as early as possible into the training curricula of pilots and AMEs. Practicing decision making skills throughout the training program will provide the new generation of pilots and AMEs who will be working in the Air Taxi industry with skills and habits that will enhance safety.

*SR 26 Recommend Transport Canada develop a standard for human factors and decision making training. This training should start as early as possible and continue throughout the curricula of flight training units, aviation colleges and AME programs.*

## **MANAGEMENT**

It was evident in the industry consultation sessions that Air Taxi management, pilots and AMEs were interested in obtaining more information and education on decision making and human factors issues. A safety-minded company's management is committed to safe operating practices and provides its employees with the tools, encouragement, and support required. Air Taxi management is not always aware of what services or training Transport Canada System Safety has to offer and the System Safety branch is not always aware of changes in air operator personnel. Commercial and Business Aviation inspectors interview prospective Chief Pilots and Operations Managers prior to their acceptance to that position by Transport Canada. These new managers should be made aware of human factors courses and other training that is available.

*SR 27 Recommend Transport Canada provide the Chief Pilot and Operations Manager on initial appointment to that position with information about courses and training materials available from System Safety (e.g. Decision Making/Human Factors, Company Aviation Safety Officer course, etc.)*

*SR 28 Recommend Transport Canada encourage Air Taxi operator management to attend the Company Aviation Safety Officer (CASO) course.*

*IA 28 Recommend Air Taxi operator management attend the CASO course and implement the principles learned in the course in their company.*

The Canadian Aviation Regulations do not require a safety program for Air Taxi operations, although many companies have established an in-house safety program. These programs are not necessarily formalized in the operations manual but normally consist of having safety meetings from time to time, posting company bulletins about safety, open communication between operating personnel and management, open discussion of problems experienced in day-to-day operations and most importantly, management's insistence on safe operating practices. Some of the benefits of operating incident- and accident-free are lower maintenance costs, lower insurance

rates, less down time for aircraft, more productive pilots, continued good reputation with clients, and increased motivation and positive attitude of employees.

*SR 29 Recommend Transport Canada promote the benefits of having a company safety program to Air Taxi operator management and review the requirement for Air Taxi operators to have a company safety program.*

*IA 29 Recommend Air Taxi operators establish a company safety program that is fully supported by management.*

When an accident occurs, often the pilot is the only one held accountable. While the pilot may be at fault for having made a poor decision or series of decisions that led to the accident, other questions have to be asked...Were there any systemic problems in the company? What was management's role in the accident? What did management do to prevent the accident? What is management doing to prevent a recurrence? Management must be accountable for the safety of the day-to-day operations. When management is held responsible for an accident, they will become more proactive in promoting safe operating practices.

*SR 30 Recommend the Transportation Safety Board evaluate the management factors that contributed to the accident during the accident investigation.*

## NAVIGATION

Concerns were raised about the misuse of Global Positioning System (GPS) as a navigation tool when pilots are using GPS to the exclusion of maps. Map reading skills as one pilot stated, "are becoming a lost art". Dependence on GPS can lead the pilot into a false sense of security that he cannot get lost, that the unit can't fail. If the pilot is operating in reduced visibility conditions and is relying on the GPS for navigation information, he may be monitoring the GPS rather than keeping a look out for traffic and obstacles.

*SR 31 Recommend Transport Canada continue to publish articles in the Aviation Safety Letter and Vortex newsletters about the safe, proper use of GPS and the hazards associated with its misuse.*

*IA 31 Recommend air operators inform their pilots about the operating limitations and company limitations of GPS equipment. Recommend pilots be aware of and respect the operating and company limitations of GPS and practice good airmanship by having back-up navigation equipment tuned and identified and by referencing maps when operating VFR.*

The accuracy of GPS makes it a very efficient navigation tool, but its accuracy has potential negative safety implications if opposite direction traffic is climbing or descending through the same altitude or operating at the same altitude.

- SR 32 Recommend Transport Canada promote the practice of using offset GPS tracks or other means to reduce the potential for conflict between opposite direction traffic on the same route and altitude.*
- IA 32 Recommend pilots make position reports, monitor appropriate VHF frequencies and remember that they are responsible to see and avoid other traffic when flying in Visual Meteorological Conditions (VMC).*

Computer generated VFR navigation charts (VNC) do not contain enough detailed topographical information for pilots flying at low level. The charts appear to be more acceptable for pilots operating at higher altitudes, since the detail is representative of what a pilot would see at about 8000' AGL. Pilots flying at low level have difficulty getting accurate fixes to determine their position.

- SR 33 Recommend NAV CANADA revise VFR navigation charts to include more detailed topographical information.*

When aeronautical charts are updated, flight training schools and other chart dealers are required to return the "coupon" that is attached to the out-of-date maps within 30 days or they will not receive a rebate for returning the out-of-date maps. This administrative procedure has resulted in many chart dealers discontinuing this service which makes it more difficult for pilots to access maps or obtain current charts.

- SR 34 Recommend Transport Canada notify the Canada Map Office that the accounting procedure for chart dealers has caused some to stop offering the service, resulting in diminished availability of current charts.*

## **OPERATING PRESSURES**

Pilots conducting medical evacuation (MEDEVAC) flights are often notified of the patient's condition by the dispatcher or the medical attendants. It is certainly human nature to want to know the patient's condition, however, when a patient's condition is critical, the pilot may feel pressure to take chances that he would not necessarily take if the flight were routine. Ideally, the patient's condition should not influence the pilot's operational decision making. Many pilots are concerned that if they refuse to take a MEDEVAC flight and the patient dies, they would certainly feel responsible and may be held responsible for the death. When the hospital or clinic requests the MEDEVAC flight, there should be no indication to the air operator or pilots of the patient's condition. The decision to take the flight or not would then be based only on operational conditions and would preclude operational decisions being based on information

other than what is relevant to flight safety. When the patient is transferred to the aircraft, there should be limited exchange of information about the urgency of the flight.

*SR 35 Recommend that air operators and pilots not be told of the patient's critical condition prior to or during a MEDEVAC flight, only cabin requirements, such as temperature or cabin altitude, should be discussed.*

Pilots can be pressured by management to take a flight in poor weather conditions or with an overloaded aircraft or with an unserviceable aircraft fearing dismissal if they don't take the trip. Many pilots are unaware of the Canada Labour Code, Part II or the Occupational Safety and Health (OSH) regulations and the methods of recourse that are open to them if they feel they have been unfairly treated by an air operator or if they refuse to work because of dangerous work conditions. Air operators should also be aware of their rights and the rights of their employees as outlined in the Canada Labour Code, Part II and the OSH regulations.

*SR 36 Recommend Transport Canada promote awareness of the Canada Labour Code, Part II and the Occupational Safety and Health (OSH) regulations to the aviation industry.*

*IA 36 Recommend air operators and pilots educate themselves on the Canada Labour Code, Part II and the OSH regulations.*

When a pilot is being paid by the mile or the hour flown, or is being paid only for completed flights, it puts pressure on the pilot to fly as many hours as possible and to complete the flights. These methods of remuneration have a direct and negative effect on the pilot's decision making, especially in seasonal operations where there are only a few weeks or months to work. Some operators offset this pressure by paying their pilots a fixed salary. Others require the client to pay for the flight time if the client wants to just "take a look" at the weather and the pilot doesn't complete the flight.

*SR 37 Recommend Transport Canada investigate a means to require air operators to remunerate pilots in a way that eliminates the operating pressures associated with the method of payment.*

*IA 37 Recommend air operators and pilots acknowledge the negative effect that the "pay-by-the-mile" method of payment can have on safe operational decision making. Recommend air operators and pilots make decisions based on safety, not remuneration and that air operators consider other methods of remunerating pilots.*

## **OPERATING PROBLEMS**

The airport at Nain, Labrador operated by the Government of Newfoundland is subject to variable wind conditions such that the wind may be blowing from different directions at each end



of the runway. Considering the amount of traffic generated by the Voisey's Bay mining activities, an additional windsock would provide pilots with more information about wind direction and fluctuations, especially pilots without local knowledge. The Canada Flight Supplement currently notes "Wind direction 2700 - 3600 can cause turbulence and downdraft. Hills to 800' ASL 5000' W of thld 06."

*SR 38 Recommend the Government of Newfoundland and Transport Canada Aerodrome Standards, Atlantic Region be notified of the concerns raised about the need for an additional windsock at Nain, Labrador.*

The requirement for aircraft to be equipped with a Mode C transponder to operate in Terminal Control Areas (TCA) unless they have an air traffic control (ATC) clearance has created congestion of VFR traffic at altitudes below the TCA since many small aircraft, both commercial and private, are not equipped with Mode C transponders. These aircraft operate below the TCA that is typically structured to extend from the centre of the airport to a 12 NM radius based at 1200' AGL and a 35 NM radius based at 2200' AGL. There are no VFR routes that can be used to transit under or around the TCA.

*SR 39 Recommend Transport Canada and NAV CANADA review the requirement for VFR routes for aircraft transiting around or through a TCA.*

During the summer, many American pilots fly into Canada to fish, hunt, fly the Alaska Highway, etc. American pilots are not always aware of the differences between U.S. and Canadian regulations. It would be beneficial for these pilots to have a quick reference outlining the differences. The Federal Aviation Administration (FAA) has produced a quick reference card outlining pertinent U.S. regulations on one side of the card and corresponding Canadian regulations on the other side.

*SR 40 Recommend Transport Canada, in cooperation with the FAA, produce Canada/U.S. differences cards updated with the new Canadian Aviation Regulations requirements.*

Fuel storage is a problem for operators, especially on the west coast of British Columbia. Fuel caches are being jeopardized by environmental concerns of fuel spills and the subsequent contamination of the surrounding land and water. Some fuel caches have been removed without the knowledge of the air operators, which has safety implications when a pilot is counting on fuel being available only to find it has been removed. Having fuel caches gives a pilot more options, especially when poor weather is a factor.

Environmental groups insist that barrels must be stored upright to preclude fuel leakage. This method of storage increases the risk of fuel contamination from water that settles on the top of the barrel. A proposed solution was to fit a plastic lid on the barrel. However, lids are a potential danger to helicopters if the rotor downwash lifts a lid into the rotor blades. Pilots and AMEs fueling aircraft from fuel caches are responsible to ensure that fuel is not spilled. If the entire contents of the fuel drum are not used, the remaining fuel should be transported away from the fuel cache in the barrel and not dumped on site.

Aviation fuel is not readily accessible on the west coast of Canada. Many suppliers have withdrawn their services as a result of increased regulation and environmental liabilities. Coupled with the decrease in the availability of fuel caches and the reliability of the fuel in those caches, fuel supplies are diminishing.

*SR 41 Recommend Transport Canada contact the federal and provincial environment authorities to determine if they are misinformed about the proper storage practices for fuel drums and advise them of the safety-related requirements for air operators to have fuel caches.*

*SR 42 Recommend Transport Canada, in cooperation with fuel suppliers, publish information for pilots and AMEs on proper fueling practices from fuel caches.*

There is no central reporting system for current information on blasting operations. Alert areas are noted on VFR charts for ongoing activities such as mining, but blasting on road construction sites most often occurs at random. Avalanche control involves firing an explosive device at the cornice of snow to induce a "controlled" avalanche. Itinerant pilots are often unaware of the location of these activities. A system is currently being tested in British Columbia that would alert pilots to blasting activities. This is a remote, ground based system that emits a distinct tone on a specified VHF radio frequency when blasting activities are in progress.

*SR 43 Recommend Transport Canada review the Automatic Terminal Information Service / Aircraft Radio Control of Aerodrome Lighting unit that is being tested by the British Columbia Aviation Council for alerting pilots to blasting operations to determine if this technology can be used to alert pilots to areas where avalanche control and other blasting operations are being conducted.*

*SR 44 Recommend that VFR charts note areas of avalanche control activity.*

There is no notification of the times and areas of operation for military activities, when these occur outside designated military flight areas. Pilots can encounter low-flying, often high-speed

aircraft involved in military exercises or transiting between the designated flight area and their base. Additionally, some military aircraft are not equipped with VHF radios and cannot broadcast their position to civilian pilots.

*SR 45 Recommend Transport Canada request the Department of National Defense (DND) publish a telephone number in the Canada Flight Supplement for civilian pilots to report near mid-air collisions with military aircraft.*

*IA 45 Recommend pilots report near mid-air collisions with military aircraft to a Flight Service Station Specialist or Air Traffic Controller until the DND telephone number is established.*

Pilots, especially helicopter pilots, are often required to stay at the fire camp rather than "commute" from the nearest town. Forest fire suppression activities include repetitive work when waterbucketting, stressful work when the fire is extremely active and often work in reduced visibility from smoke. Pilots must be alert to other traffic in the area; helicopters, float planes supplying the fire camps, waterbombers and bird-dog aircraft.

Suitable accommodation is required for pilots to be well rested and prepared to work the long duty days typical of forest fire suppression work. The Canadian Aviation Regulations contain a definition of suitable accommodation that must be provided to pilots. Forestry agencies may not be aware of this requirement since it is new to the regulations. Suitable accommodation "means a single-occupancy bedroom that is subject to a minimal level of noise, is well ventilated and has facilities to control the levels of temperature and light or, where such a bedroom is not available, an accommodation that is suitable for the site and season, is subject to a minimal level of noise and provides adequate comfort and protection from the elements".

*SR 46 Recommend Transport Canada advise the provincial and territorial Ministry of Natural Resources fire centres of the requirement for pilots to be provided with suitable accommodation.*

*IA 46 Recommend air operators ensure their clients are aware of the requirement for pilots to be provided with suitable accommodation and ensure their clients provide pilots with suitable accommodation.*

The outlying community aerodrome runways in northern Manitoba are typically 2800 - 3000 feet in length, as opposed to 3500 feet that is typical in other provinces and territories. The shorter runway length restricts the type of aircraft that can operate to these communities and can restrict the operating capabilities of those aircraft by limiting the number of passengers or amount of cargo or fuel that can be carried. Also, the pilots can experience black hole illusion during night landings. The installation of Precision Approach Path Indicators (PAPI) or Visual Approach Slope Indicators (VASI) would be a great safety improvement.

*SR 47 Recommend Transport Canada advise the Manitoba Government of the concerns raised about the length of the runways at community aerodromes in northern Manitoba and that visual reference on approach would be enhanced if the aerodromes were equipped with a Precision Approach Path Indicator (PAPI) or a Visual Approach Slope Indicator (VASI).*

*SR 48 Recommend Transport Canada initiate research and development into a less expensive, remote PAPI or VASI system.*

CAR 602.77 requires that pilots close their flight plan or flight itinerary as soon as practicable after landing. Many locations, such as bush camps or remote locations, do not have radios or telephones to allow the pilot to close the flight plan or itinerary after landing. This is especially true for helicopters and float-planes. When a pilot arrives at destination and finds there is no means to contact the appropriate air traffic service, the pilot would have to take off again to close the flight plan or itinerary in the air prior to the time specified for the initiation of search and rescue. Pilots may not file a flight plan or itinerary if they know there will be a problem closing it or they may designate excessive search and rescue times in order to increase the time available for closing the flight plan or itinerary.

## STATISTICS

In comparison with Commuter and Airline aircraft, between the years 1990 - 1995, Air Taxi aircraft had the highest number of accidents, number of fatal accidents and fatalities each year. However, the number of accidents is not related to data that could make the statistics more useful. Air Taxi operators are not required to submit to Transport Canada the number of hours flown nor the number of aircraft movements.

Transport Canada requires statistics that are more relevant to Air Taxi operations, to target problem areas and to target the areas where safety programs would assist in accident prevention. To accomplish this, statistics have to be gathered on a regular basis from Air Taxi operators. These statistics should include, at least, the number of movements and hours flown by each aircraft, whether fixed-wing or helicopter, the type of undercarriage, Canadian Aviation Regulation subpart, and occurrence location by Transport Canada Region.

*SR 49 Recommend Transport Canada require Air Taxi operators to submit relevant statistics to determine where accidents are occurring and to target areas where resources should be allocated for accident prevention programs.*

The accident statistics collected and published by the Transportation Safety Board of Canada (TSB) could be used to determine where accidents are occurring more frequently, if the accuracy of the information contained in the database could be guaranteed. All information relevant to each accident should be entered into the database including, type of aircraft whether fixed-wing or helicopter, type of undercarriage, number and type of engines, Canadian Aviation Regulation subpart, occurrence location by Transport Canada Region, initiating event and subsequent events, contributing factors, reference to a geographical point, number of fatalities, etc. Data items such as the "phase of flight" reflect fixed-wing modes of flight and do not capture helicopter phases of flight such as hover, lift-off, translation, etc. Effective analysis requires data that are valid for the type of operation being considered and the Transport Canada Region in which the accident occurred.

*SR 50 Recommend Transport Canada review relevant databases, such as the Canadian Aviation Daily Occurrence Reporting System (CADORS) and the Aviation Safety Information System (ASIS) to determine that they contain meaningful data and that suitable quality control is in place.*

Many operators and pilots are interested in accident and incident statistics relevant to their types of operations, geographic location or types of aircraft operated. Newly certified air operators would especially benefit from this information. Statistics would provide them with insight into the problems that have occurred to other operators in the area or with the same type of aircraft they are operating.

*SR 51 Recommend the Transportation Safety Board inform air operators that it can provide statistics as required.*

## **TRAINING**

There is a lack of information available to passengers in float-planes and helicopters about underwater egress in the event the aircraft flips over on take-off or landing or ditches and rolls over. Survival training is available for personnel who work in offshore oil operations, but clearly that level of training isn't required for the majority of passengers. Some work has been done by Transport Canada System Safety on this subject but it needs to be compiled into a format that is easily distributed.

*SR 52 Recommend Transport Canada develop a brochure outlining underwater egress procedures that air operators can provide to their passengers and clients.*

*IA 52 Recommend float-plane pilots and helicopter pilots operating over water include information on underwater egress procedures in the passenger briefing.*

Annual surface contamination training and an examination is required for all operational personnel. Many comments were received about the inappropriate nature of this training for many operations, most notably for helicopters. Discussion of the various types of deicing fluids and application methods is not relevant to the majority of Air Taxi operations. The training aids that are produced by Transport Canada need to be revised to make them applicable to specific types of operations. Also, there are no training aids specifically tailored to Aerial Work operations.

*SR 53 Recommend Transport Canada develop various modules of the surface contamination training program that are relevant to specific types of VFR operations, such as Air Taxi, Aerial Work operations and helicopters.*

During the industry consultation sessions it became evident that many pilots, air operators, and even Transport Canada Civil Aviation inspectors are unaware of the courses, training materials including safety videos, and safety information that TC System Safety has developed. These training tools should be better promoted to industry and internally within TC. In cooperation with NAV CANADA, printed weather packages could advertise upcoming courses.

*SR 54 Recommend Transport Canada advertise safety courses, safety programs and safety information (brochures, videos, etc.) on the Safety Services Website and in the various Aviation Safety newsletters.*

*IA 54 Recommend air operators, pilots and AMEs attend safety courses and distribute the information to other employees. Recommend air operators support their employees' participation in these courses.*

The introduction of the CARs required the aviation industry to become knowledgeable about a large amount of information in a relatively short time. It would be beneficial for pilots, air operators and AMEs to learn this information in other ways as well as reading the CARs or the Aeronautical Information Publication. Learning that is challenging or fun will be retained longer than simply reading the regulations.

*SR 55 Recommend Transport Canada include safety quizzes in the various Aviation Safety Letters targeting new or amended procedures and regulations to provide the aviation industry with a more interesting way of learning.*

## **TRANSPORT CANADA**

One comment that was expressed at the majority of the industry consultation sessions was that the participants appreciated being able to tell Transport Canada, in person, what they think. The aviation industry hasn't had this opportunity very often and would like to see more of these

sessions. If more informal meetings like this one were held, the working relationship between Transport Canada and the aviation industry would improve, more information would be passed among the participants, interpretations of the regulations could be provided and misinterpretations of the regulations could be resolved. Agenda items could be submitted by the industry to discuss specific problems of interest to them. These meetings would also provide Transport Canada inspectors with more insight into the Air Taxi industry's operating practices and difficulties.

*SR 56 Recommend Transport Canada facilitate information sessions to provide a forum for the exchange of ideas and information between Transport Canada and the Air Taxi industry.*

*IA 56 Recommend air operators, pilots, AMEs, Air Traffic Control/Flight Service Station personnel actively participate in these sessions. Recommend air operators support their employees' participation in these sessions.*

The SECURITAS program run by the Transportation Safety Board provides a method for members of the aviation community to confidentially submit information about incidents or potentially unsafe acts or conditions. It was criticized as not providing feedback to the people who submit information and also not providing information to Transport Canada System Safety. The Federal Aviation Administration (FAA) has established the Aviation Safety Reporting System (ASRS) that is being administered by the National Aeronautics and Space Administration (NASA). The program allows people to report incidents, occurrences and potentially unsafe acts confidentially and with impunity, except in cases of an aircraft accident or criminal activity. Valuable information can be gathered to identify where resources should be allocated for accident prevention programs and also provide information about industry operating practices.

*SR 57 Recommend Transport Canada establish a confidential reporting system for safety concerns and regulatory infractions modeled after the NASA Aviation Safety Reporting System (ASRS).*

Transport Canada's audit and inspection methodology was criticized as not being sufficiently operations-oriented and not occurring frequently enough. Inspections and audits that check only the paperwork don't give a true perspective of the actual operation. As an example, since aircraft inspections are done in a stationary aircraft rather than when the aircraft is in flight, the inspector can only confirm that the instruments are installed, not that they are functioning. If Civil Aviation inspectors performed "inflight" inspections, especially now that industry has more delegated authority to perform pilot proficiency checks, it would provide Transport Canada with a better understanding of operating conditions, operational practices and pressures. Inflight inspections should be conducted in both single- and multi-engine aircraft.

*SR 58 Recommend Transport Canada conduct more operations-oriented audits and inspections.*

*SR 59 Recommend Transport Canada conduct in-flight inspections in Air Taxi aircraft.*

Transport Canada was criticized for providing sufficient notice of an upcoming audit that the operator had time to get the paperwork in order before the auditors arrive. Less notice would give Transport Canada a better indication of the air operator's actual operation. Also, more random inspections should be done, especially during the operators' busy season. Pilots commented that Transport Canada inspectors rarely conduct inspections on job sites, that the inspections are limited to ramp inspections or audits. Non-compliance with the regulations was thought to occur more frequently in areas removed from main airports where inspectors are less likely to conduct random inspections. There is also the perception that regulatory compliance is not applied uniformly among operators and that some operators have an obvious disregard for the regulations but Transport Canada is either unaware or chooses to overlook this.

*SR 60 Recommend Transport Canada conduct more random audits and inspections.*

*SR 61 Recommend Transport Canada provide more regulatory compliance presence, especially in northern and remote areas.*

Transport Canada was also criticized for not conducting follow up of audit findings. When audit findings are not rectified by the air operator, the unsatisfactory operating condition continues and often the deficiencies are noted in the subsequent audit.

*SR 62 Recommend Transport Canada ensure all audit follow-up is completed.*

*IA 62 Recommend air operators ensure all audit findings are rectified.*

Air Taxi operators and pilots feel that air carrier inspectors do not have the appropriate background to understand VFR issues and issues that are specific to certain operations or regions. For example, the west coast operators and pilots felt that there was no one in Commercial and Business Aviation, Pacific Region who had recent experience in the unique operating conditions of west coast float operations. All Transport Canada inspectors must possess an Airline Transport Pilot Licence in order to qualify for the position. Often this means that the inspector has not been flying in VFR operations for some time before being hired by Transport Canada. The same comments were received from operators and pilots throughout the other Regions. It was suggested that Transport Canada should have inspectors on staff with strong VFR backgrounds who could deal sensitively with VFR issues. Many



negative comments were received about Transport Canada hiring inspectors with no commercial operating experience.

*SR 63 Recommend Transport Canada Regional Commercial and Business Aviation inspector personnel are more representative of the demographics of the aviation industry.*

The attitude of some Transport Canada air carrier inspectors was criticized as being arrogant and uncooperative. A more cooperative attitude between inspectors and the industry will enhance the working relationship and eliminate the "we vs. they" mentality. Since they are part of the aviation system, air carrier inspectors should be perceived as being approachable and a good resource for information, not just as the regulator who is interested in catching pilots and operators who are breaking regulations. Industry has no recourse if they are concerned about a particular inspector's behaviour.

*SR 64 Recommend Transport Canada establish a conflict resolution program where members of the aviation industry can confidentially report problems with individual Civil Aviation inspectors.*

Air operators are most often not aware of exemptions to the CARs or CASS that have been issued to other air operators. Often the air operator spends time determining how to comply with the regulation, time that could be spent involved in other tasks if the operator knew an exemption was available. The de-identified text of exemptions issued to air operators should be available to ensure air operators across Canada are being treated equitably. An exemption may also make the operation more efficient and save the operator money. If a sufficient number of the same exemption are issued, Transport Canada should consider including the conditions of the exemption in the CARs or CASS.

*SR 65 Recommend Transport Canada publish on the Internet and in hard copy an inventory of exemptions that have been issued to air operators.*

*SR 66 Recommend Transport Canada analyse all exemptions issued to air operators to determine if any should be revoked and the conditions of those exemptions included in the Canadian Aviation Regulations or Canadian Aviation Regulations Standards.*

Not all helicopter pilots wear a helmet even though there is considerable evidence that helmets can prevent serious injury or death in the event of an accident. Many pilots who are not used to wearing helmets complain that they are heavy, hot, uncomfortable and cause fatigue. Pilots are more likely to wear helmets if they are used to wearing one from the time they start flying. It takes time for people to get used to wearing safety equipment as was evident in the phase-in of helmets

with hockey players and the phase-in of the seat belt laws. Now, almost without exception, all hockey players are wearing helmets and people are buckling up as a matter of habit. Often passengers in helicopters will have some sort of protective headgear with them, such as a hard hat, that they use while they are working. Passengers should be advised to wear this protective headgear if it is available.

*SR 67 Recommend Transport Canada continue to promote in the Aviation Safety Vortex newsletter the safety benefits of helicopter pilots wearing helmets, especially in aerial work operations, and promote flight training units to encourage student pilots to wear helmets.*

*IA 67 Recommend that helicopter air operators, especially aerial work operators, encourage their pilots to wear helmets, that commercial helicopter pilots wear helmets and that flight training units encourage student helicopter pilots to wear helmets.*

*SR 68 Recommend Transport Canada promote customer education to encourage passengers who have protective headgear to wear it while in the helicopter.*

*IA 68 Recommend air operators and pilots encourage passengers who have protective headgear to wear it while in the helicopter.*

## **WEATHER**

The closing of lighthouse stations by the Canadian Coast Guard has reduced the weather information available to pilots flying on the west coast of British Columbia. Lighthouse keepers aren't accredited aviation weather observers, but the information they provide is essential for west coast VFR pilots since it is the only local weather information available. The Pacific coast is a unique operating environment where the weather conditions change quickly and vary dramatically over short distances due to localized weather phenomena.

Aviation weather reporting was thought to be inadequate even prior to the decommissioning of lighthouses. Weather information is perceived to be geared to IFR aircraft and not appropriate for VFR operations since the information is often not valid within a few miles of the reporting source. VFR pilots on the west coast need to know weather conditions at and below 1000 feet ASL.

Comments were received that weather information from the lighthouse stations, which was issued every three hours, was ignored if it was more than one hour old since pilots are looking for more current observations. Other comments indicated that not all lighthouses were required, only specific ones that are located in areas where there is significant variable weather activity or at other strategic locations.

Marine and aviation weather services appear to be isolated. Better and additional services could be realized if these were amalgamated. Weather information from ships, tugboats, fishing boats and lighthouses should be made available to pilots. Most aircraft are equipped with FM radios and can communicate with fishing boats and other ships.

The operating conditions on the west coast require VFR pilots to push into, through or above fog and cloud. The Task Force was told that if pilots don't operate in these conditions, the companies can't survive because these are typical coastal weather conditions. It has become an acceptable (to industry), though illegal, way of operating. Providing pilots with better weather reporting will enhance their decision making as far as choosing a route to fly or areas to avoid, but it will not stop them from continuing to fly into deteriorating weather conditions. It is important to note that in recent weather-related accidents that have occurred on the west coast and elsewhere, the pilots were flying in weather conditions less than the minimum allowed by regulation.

The British Columbia Air Operators Group is a subcommittee of the British Columbia Aviation Council. NAV CANADA has been involved in discussions with this group in an attempt to resolve the weather service issue, by determining user requirements and meeting those demands. Transport Canada should ascertain the progress of solutions to this problem and determine what effect the loss of weather reporting services has had and will have on aviation safety.

*SR 69 Recommend Transport Canada consult with the British Columbia Air Operators Group and NAV CANADA to determine what is being done to improve the weather reporting services on the west coast of British Columbia. A safety review of the issues would be justified if there is no obvious and timely solution to these problems.*

The quality of weather information and availability has deteriorated significantly as a result of the closing of FSSs and the loss of Remote Communications Outlets (RCOs). Many of the FSS Specialists who had been working in the same area for many years had insight into local weather phenomena. This local knowledge and insightful weather information has been replaced by an FSS Specialist on a telephone line. Pilots have experienced difficulty in reaching an FSS for weather information or to file a flight plan. The lines are busy and in some cases, the 1-800 number doesn't transfer to another facility to be answered. Additional lines would assist pilots in obtaining timely information or file flight plans. Pilots and dispatchers who need information quickly, such as in the case of a MEDEVAC flight, are finding the service to be inadequate. If pilots and dispatchers could obtain weather information and file flight plans on the Internet, it would reduce congestion on the phone lines. (See SR 70)

*SR 70 Recommend NAV CANADA publish Canadian weather information, notices to airmen (NOTAMS) and provide flight planning capability on the Internet.*

Current pilot reports (PIREP) provide other pilots, dispatchers and meteorologists with valuable information about actual weather conditions. This information may not otherwise be available especially in areas where localized weather phenomena occur and there is no weather reporting station in that area. PIREPs also validate forecasts or identify the need for an update. Pilots, especially those flying in areas of variable weather conditions such as coastal and mountainous areas, should be encouraged to file PIREPs to assist other pilots and meteorologists.

*SR 71 Recommend Transport Canada Commercial and Business Aviation and Flight Training Standards inspectors and flight instructors promote the benefits of filing PIREPs and that Transport Canada publish an article in the Aviation Safety Letter and Aviation Safety Vortex newsletters encouraging pilots to file PIREPs.*

*IA 71 Recommend pilots file PIREPs especially in areas of variable weather conditions and where weather reporting is less available or reliable.*

User dissatisfaction with Automated Weather Observation System (AWOS) is well known and the Task Force received many comments about the inadequacies of AWOS. False reports of low clouds, reports of clear weather when there was reduced visibility (CLR BLO 100), lack of icing or freezing precipitation, missing or late sequences, were among the deficiencies of the AWOS system that were cited. Reliability is a concern and many users do not trust AWOS reports.

The Task Force is not issuing a recommendation concerning AWOS since action to resolve the problems with AWOS is progressing. The Aviation AWOS Performance Evaluation Group (AAPEG) was established in 1995 to "determine the extent to which AWOS meets aviation requirements". The Evaluation Group has completed its review and published its final report in November 1997. It concluded that AWOS performance has markedly improved and recommended that the TC moratorium against the commissioning of further aviation AWOS be lifted. In brief, several recommendations were made for further research and development with stakeholder support for further commissioning. It also recommended that a quantitative study be completed to verify the comparative accuracy of aerodrome forecasts (TAF) developed using AWOS observations vs. human observations.

## **SAFETY OF AIR TAXI OPERATIONS (SATOPS) TASK FORCE TERMS OF REFERENCE**

### **BACKGROUND**

After analysis of accident data, Transport Canada Aviation has concluded that most commercial aviation accidents occur in the air taxi sector. While the total number of accidents in 1995 was close to the average, the fatal accident record was higher than the five year average. The Air Carrier Inspection Task Force Report stated that Transport Canada defines aviation safety "as a condition achieved through the systematic process of identifying and forecasting aviation risks and developing facilities, services, programs or procedures to minimize these risks, thereby preventing the loss of aviation resources due to accidents or incidents." Although it is in the interest of the aviation industry to minimize these risks, the accident record shows that this "condition" is not well focused in the air taxi operational environment.

Transport Canada Aviation believes that more regulation is not necessarily the solution since Transportation Safety Board (TSB) investigations have shown that contributing factors in many of these accidents included a disregard of current regulations. From a human factors perspective, Transport Canada requires an understanding of the air carriers' attitudes towards safe operating practices. These attitudes are generated by management, transferred to the pilots and other operational personnel, and influence the air carriers' operating practices and the pilots' decision making.

With the introduction of the Canadian Aviation Regulations and the further delegation of responsibilities to the aviation industry, it is timely that Transport Canada Aviation, in consultation with the industry, address the safety record of air taxi operators.

### **OBJECTIVE**

The Task Force (TF) will propose ways to improve the safety record of the air taxi segment of the aviation industry. It will also address the subjects of TSB recommendations that impact on air taxi operations.

### **METHOD**

The TF will meet with air operators and pilots in an open forum in several locations in each of the Regions as determined by the demographics study conducted by an aviation consultant. Through these consultations the TF will :

1. identify the culture or attitudes that are evident in this sector of the industry and/or identifiable geographic areas;
2. work with the aviation industry to clearly define the problems, seek solutions and resolve issues in an open and consultative forum;
3. identify safety practices that are being applied by individual air carriers and that can be shared with and utilised by other air carriers;
4. review the air carrier/client relationship;
5. determine the effectiveness of the TCA inspection and audit program from both the Transport Canada and the air carriers' perspective;
6. determine how to improve communication of safety related concerns between Transport Canada Aviation and the aviation industry; and
7. recommend ways to address the identified problems.

### **SCOPE**

The Task Force will focus on the fixed wing and helicopter air taxi segment (9 passengers or less) of the industry. Some commuter (10 - 19 passengers) operations will also be reviewed since many of the air taxi operators also operate commuter aircraft.

### **TASK FORCE**

The Task Force will be comprised of representatives from aviation industry and labour associations as well as Transport Canada Headquarters and Regional personnel from Air Carrier and System Safety. Co-operation is anticipated from the Regional Directors who will nominate personnel to become involved in the Task Force. A list of the personnel will be attached to the terms of reference. J.E. Adamson, Air Carrier Operational Standards, will chair the Task Force.

### **STEERING COMMITTEE**

A Steering Committee chaired by D. Spruston, Director General, Civil Aviation with the following members will direct the Task Force:

<i>N. Leblanc</i>	- <i>Director, Standards and Studies</i>
<i>A.J. LaFlamme</i>	- <i>Director, Air Carrier</i>
<i>W. Peters</i>	- <i>Director, Safety Programs</i>
<i>M.R. Preuss</i>	- <i>Chief, Air Carrier Operational Standards</i>
<i>J. Coulliard/R. Corkett</i>	- <i>Director, Air Navigation System Requirements</i>

**REPORTING**

The TF will report to the Steering Committee on a regular and on an “as required” basis. The Steering Committee will provide guidance and direction to the TF and approve the work plan developed by the TF.

The TF Chair will consult a SATOPS Industry Advisory Committee comprised of representatives from the aviation industry. This advisory committee will provide the TF with an industry perspective on the identified problems and may identify other problems. The TF will solicit solutions to these problems from the advisory committee.

**TIMING**

An aviation consulting company was contracted on February 1, 1996 to identify problems and develop a TF plan for the joint industry/Transport Canada meetings. Proposed project milestones are as follows:

1. The consultant’s report will be submitted to Transport Canada by March 25, 1996.
2. Review of the consultant’s report and development of workplan and budget completed by May 17, 1996.
3. An Air Carrier Advisory Circular will be distributed to advise air carriers and pilots of this project and to advise them of the planned meetings by May 31, 1996.
4. The Task Force will schedule meetings with air carriers in early fall for completion by November 15, 1996.
5. Draft report completed by November 29, 1996.
6. Final report completed by December 31, 1996.

**BUDGET**

The Task Force Chair will prepare a budget for approval by the Steering Committee. The budget will outline Transport Canada Aviation resource commitments and indicate where industry resource commitments will be sought.

**ADMINISTRATIVE SUPPORT**

Air Carrier Operational Standards (AARXB) will provide administrative support.



D. Spruston  
*Director General, Civil Aviation*



W. Peters  
*A/Director General, System Safety*

Accepted by:



for J.E. Adamson  
*Chair, SATOPS Task Force*

Steering Committee:



N. Leblanc  
*Director, Standards and Studies*



for A.J. LaFlamme  
*Director, Air Carrier*



P. Marquis  
*A/Director, Safety Programs*



M.R. Preuss  
*Chief, Air Carrier Operational Standards*



J. Coulliard  
*Director, Air Navigation System Requirements*



## **ADDENDUM TO AMEND THE SAFETY OF AIR TAXI OPERATIONS (SATOPS) TASK FORCE TERMS OF REFERENCE**

### **METHOD**

At the initial Task Force meeting held on September 11 & 12, 1996, it was decided that Aircraft Maintenance Engineers should be invited to participate in the regional working group meetings or otherwise be able to provide input to the Task Force.

The locations for the Task Force working group meetings were determined by the regional Transport Canada representatives since the aviation consultant did not provide a demographics study in his report.

### **TASK FORCE**

Membership on the Task Force will include regional representation from the Transport Canada Airworthiness division as determined by the respective Regional Managers. These representatives will coordinate activities with the regional System Safety and Commercial Aviation representatives and participate in their respective regional Task Force working group meetings as their schedules allow.

### **STEERING COMMITTEE**

The Steering Committee, at the meeting held on October 4, 1996, approved the nomination of Don Sherritt, Director, Aircraft Maintenance and Manufacturing, as a member of the Steering Committee.

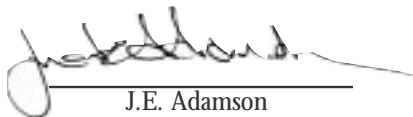
Walter Peters remains on the Committee as Acting Director General, System Safety. Bob Nicholson joined the Committee as Acting Director, Safety Programs.

### **TIMING**


The aviation consultant did not develop a plan for the joint industry/Transport Canada meetings. This will be done by the Task Force members. The proposed project milestones have been amended as follows:

4. The industry consultation working group meetings have been scheduled between January 10 and February 22, 1997.
5. Draft report completed by March 14, 1997.
6. Final report completed by March 31, 1997.

Accepted by: D. Spruston



J.E. Adamson  
Chair, SATOPS Task Force



D. Spruston  
Director General, Civil Aviation



## TASK FORCE AND COMMITTEE MEMBERSHIP

### SATOPS TASK FORCE

Judy Adamson (Chair)	Commercial & Business Aviation - Ottawa
Paul Traversy	System Safety - Ottawa
Boshra Feltaous	System Safety - Ottawa
Jim McMenemy	Aviation Training - Ottawa (Human Factors Advisor)
Marie Zubryckyj	Commercial & Business Aviation - Ottawa
Rick McGregor	Commercial & Business Aviation - Moncton
Heather MacMillan	Commercial & Business Aviation - Moncton
Alan Chaulk	System Safety - Moncton
David Walsh	Airworthiness - Halifax
Charles Warren	Airworthiness - St. John's
Jean-Paul Leblanc	Commercial & Business Aviation - Montreal
Diane Desmarais	System Safety - Montreal
Normand Savard	Airworthiness - Montreal
Phil Gerhart	Commercial & Business Aviation - Toronto
Doug Malette	System Safety - Toronto
Jim Robinson	Commercial & Business Aviation - Winnipeg
Garry Cooke	System Safety - Winnipeg
Moe Baile	System Safety - Edmonton
Steve McNab	Airworthiness - Calgary
Gord Swanson	Airworthiness - Yellowknife
Wally Bray	Airworthiness - Winnipeg
Don Bradshaw	Airworthiness - Saskatoon
Raleigh Bickford	Commercial & Business Aviation - Vancouver
Bill Yearwood	System Safety - Vancouver
Al Martin	Airworthiness - Vancouver
Fred Jones	Air Transport Association of Canada
Bob Lamoureux	Alberta Aviation Council
Thomas Blackwell	Canadian Seaplane Pilots Association
Al Eustis	Helicopter Association of Canada
Pat Doyle	Northern Air Transport Association
Don Douglas	Northern Air Transport Association

**EXECUTIVE ADVISORY COMMITTEE**

Mr. Victor Bennett

Former Chairman, Air Transport Association of Canada (ATAC), former Chairman of Innotech Aviation and former Chairman, Airshow Canada

Mr. André Lizotte

Consultant, Pro-Can Aviation Centre, former CEO Québec Air and Nordair

Mr. Bruce Pultz

Former Vice Chairman, Civil Aviation Tribunal

Mr. Elvie Smith

Director and former Chairman, Pratt & Whitney Canada

## 1997 INDUSTRY CONSULTATION SESSIONS

### PACIFIC REGION:

Vancouver	January 10	Prince George	January 15
Campbell River	January 13	Kelowna	January 16
Terrace	January 14		

### PRAIRIE AND NORTHERN REGION:

Whitehorse	January 20	Thompson	February 10
Inuvik	January 21	La Ronge	February 11
Yellowknife	January 22	Saskatoon	February 12
Calgary	January 23	Winnipeg	February 13
Iqaluit	January 31		

### ONTARIO REGION:

Dryden	January 20	London	January 27
Thunder Bay	January 21	Hamilton	January 28
Sault Ste. Marie	February 17	Buttonville	January 29
Timmins	January 23	Ottawa	January 30
North Bay	January 24		

### QUÉBEC REGION:

Rouyn	February 17	Sept-Îles	February 20
Chicoutimi	February 18	Montréal	February 22
Québec City	February 19	Montréal (English)	February 23

### ATLANTIC REGION:

Moncton	February 10	Gander	February 13
Halifax	February 11	Goose Bay	February 14
St. John's	February 12		



