

Transportation Safety Board
of Canada



Bureau de la sécurité des transports
du Canada



TSB

Transportation Safety Board



Annual Report to Parliament
2005-2006



Canada

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ANNUAL REPORT TO PARLIAMENT 2005-2006

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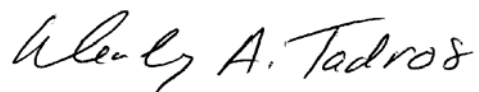
16 August 2006

The Honourable Michael D. Chong, P.C., M.P.
President of the Queen's Privy Council for Canada
House of Commons
Ottawa, Ontario K1A 0A6

Dear Minister:

In accordance with subsection 13(3) of the *Canadian Transportation Accident Investigation and Safety Board Act*, the Board is pleased to submit, through you, its annual report to Parliament for the period 1 April 2005 to 31 March 2006.

Yours sincerely,



Wendy A. Tadros
Acting Chair



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MEMBERS OF THE BOARD



Acting Chair Wendy A. Tadros (from 9 December 2005)

Transportation and legal experience includes Director of Legal Services for the National Transportation Agency of Canada; Inquiry Coordinator for “The Road to Accessibility: An Inquiry into Canadian Motor Coach Services”; and counsel to the Canadian Transport Commission before the Commission of Inquiry into the Hinton Train Collision.



Acting Chairperson Charles H. Simpson (until 8 December 2005)

Transportation executive experience includes Executive Vice-President, Operations, for Air Canada; President of the Canadian Air Line Pilots Association; and Vice-President of the International Federation of Air Line Pilots’ Associations.



Member Jonathan Seymour

Transportation policy and marine management experience includes Executive Director of International Maritime Centre-Vancouver; chartering, commercial and general manager for several shipping companies; marine policy advisor to the British Columbia government; and policy and economic consultant.



Member James P. Walsh

Was the Member of the House of Assembly in Newfoundland and Labrador for the district of Conception Bay East-Bell Island from 1989 to 2003. Most recently, served as Minister of Works, Services and Transportation, and also served as Minister of Tourism and Culture, Parliamentary Secretary to the Minister of Finance and Treasury Board, and Parliamentary Secretary responsible for the Newfoundland and Labrador Housing Corporation. Also served as Caucus Chairman and Vice-Chair of the Public Accounts Committee. In 2003, received the distinction of Honorary Life Member of the Transportation Association of Canada.



Member R. Henry Wright

Management and consulting experience includes auditor for the Ontario Ministry of Community and Social Services; senior management administrator of several non-profit organizations; and consultant in government and public relations.

CHAIR'S MESSAGE

The Transportation Safety Board of Canada (TSB) enjoys a solid reputation, nationally and internationally, as a skilled and professional investigative organization. As one of only a few multi-modal safety investigation agencies in the world, the TSB pursues its mandate within a framework of independence that makes it a global leader in that regard.

The period covered by this annual report spans a year in which the TSB was guided by two Acting Chairpersons – myself and my predecessor and colleague Mr. Charles Simpson. As you will see, it was a period of challenge and reward for this organization.

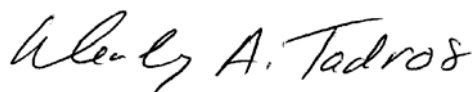
This annual report provides an update on transportation accidents and incidents reported to the TSB, its investigations, and the recommendations it has issued to address the identified deficiencies. It also presents the responses to these recommendations from the federal departments concerned, as well as the Board's assessments of the responses, which are now posted on the TSB website. We are annually actively reviewing actions taken to address our recommendations and will publish this information on our website. This action is taken in the hope that this public disclosure will act as an incentive to influence greater change and lead to improved safety actions.

The information in this report is divided into the four modes of transportation on which the TSB conducts investigations: marine, pipeline, rail and air. Occurrence statistics and descriptive tables on occurrences are provided, along with an outline of safety action taken during the year. The report also summarizes the Board's activities in areas such as liaison with the transportation community and international cooperation.

The TSB continues to be more efficient: the average time to complete an investigation went from 619 days last year to 464 days this year. This demonstrates steady progress and ensures that the transfer of safety knowledge is expedited, both in Canada and abroad. In addition, we are making significantly more information available online. The latent demand for a broader range of information available from the TSB is reflected in the number of visits to our website, which have more than doubled compared to last year.

In the same vein, the Board has started implementation of its internal information system called the Transportation Investigation Information Management System (TIIMS). This system enables the TSB to meet government information management and technology requirements while also improving operational efficiency in the delivery of our mandate.

The TSB is strongly committed to making a significant contribution to transportation safety in Canada and abroad. Our sustained efforts will ensure that our products and services, as well as our business activities, remain effective and efficient for the delivery of our mandate.



Wendy A. Tadros
Acting Chair

SENIOR MANAGEMENT

Executive Director	D. Kinsman
General Counsel	A. Harding
Director General, Investigation Operations	T. Burtch
Director General, Corporate Services	J.L. Laporte
Acting Director, Marine Investigations	E. Snow M. Ayeko
Director, Rail/Pipeline Investigations	I. Naish
Director, Air Investigations	N. Stoss
Director, Engineering	N. Cerullo

MISSION OF THE TSB

We conduct independent safety investigations and communicate risks in the transportation system.

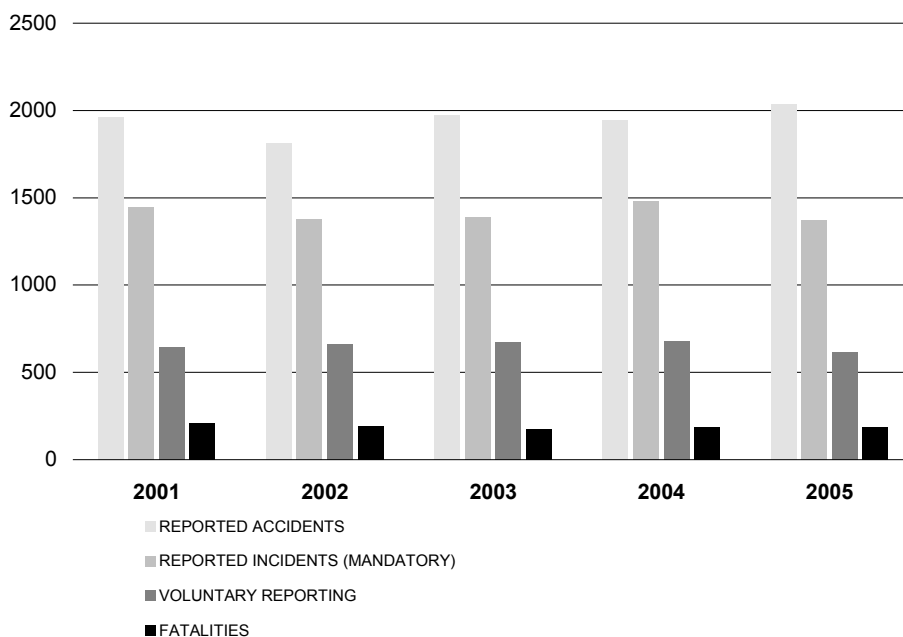
INDEPENDENCE

To encourage public confidence in transportation accident investigation, the investigating agency must be, and be seen to be, objective, independent and free from any conflicts of interest. The key feature of the TSB is its independence. It reports to Parliament through the President of the Queen's Privy Council for Canada and is separate from other government agencies and departments. The TSB's independence enables it to be objective in arriving at its conclusions and recommendations. The TSB's continuing independence and credibility rest on its competence, openness, integrity and the fairness of its processes.

OCCURRENCES, INVESTIGATIONS AND SAFETY ACTION

In 2005, a total of 2037 accidents and 1371 incidents were reported in accordance with the TSB's regulations for mandatory reporting of occurrences.¹ The number of accidents in 2005 increased by 5% from both the 1945 accidents reported in 2004 and the 2000–2004 annual average of 1946 accidents. The number of reportable incidents decreased to 1371 in 2005, down from 1483 in 2004 and the 2000–2004 average of 1414. There were also 615 voluntary incident reports. Fatalities totalled 189 in 2005, up 3 from the 2004 total but equal to the 2000–2004 average.

FIGURE 1 - OCCURRENCES REPORTED TO THE TSB



All reported occurrences were examined in accordance with the Board's Occurrence Classification Policy to identify those with the greatest potential for advancing transportation safety. Information was entered into the TSB database for historical record, trend analysis and safety deficiency validation purposes. Investigations were undertaken for 79 of the approximately 4000 occurrences reported to the TSB in fiscal year 2005–2006. In that same period, 75 investigations were completed, compared to 115 in the previous year.² The number of investigations in process increased to 106 at the end of the fiscal year from 102 at the start. Average time to complete an investigation decreased to 464 days in fiscal year 2005–2006 from 619 days in the previous year.

¹ While the Board's operations are for the 2005–2006 fiscal year, occurrence statistics are for the 2005 calendar year. Comparisons are generally to the last 5 or 10 years. For definitions of terms such as *accident*, *incident* and *occurrence*, see Appendix A.

² Investigations are considered complete after the final report has been issued.

FIGURE 2 - INVESTIGATIONS IN PROCESS/COMPLETED

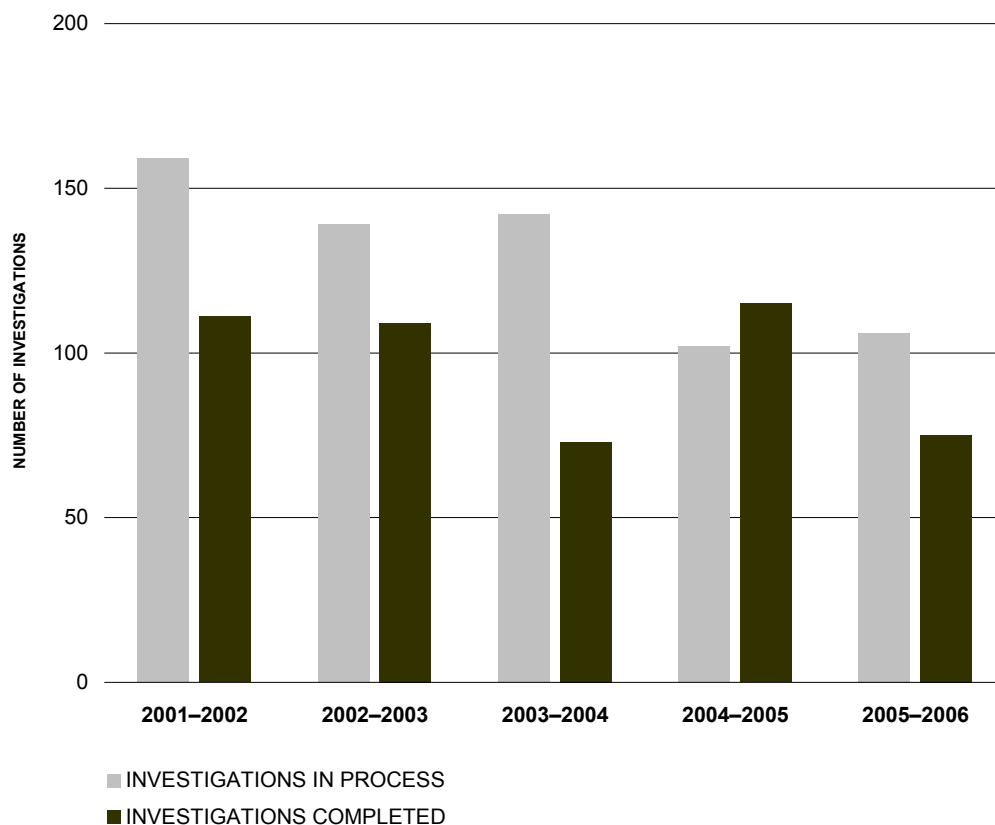


FIGURE 3 - SAFETY ACTION BY THE TSB

2005-2006	RECOMMENDATIONS ³	SAFETY ADVISORIES	SAFETY INFORMATION LETTERS
Marine	6	5	8
Pipeline	0	0	1
Rail	0	9	8
Air	6	7	5
TOTAL	12	21	22

Note: A total of 12 Safety Concerns were identified for Marine in 2005-2006.
 A total of 1 Safety Concern was identified for Rail in 2005-2006.
 A total of 2 Safety Concerns were identified for Air in 2005-2006.

³ For definitions of terms such as *recommendation*, *safety advisory* and *safety information letter*, see Appendix A.



In accordance with the *Canadian Transportation Accident Investigation and Safety Board Act*, a federal minister who is notified of a Board recommendation must, within 90 days, advise the Board in writing of any action taken or proposed to be taken in response, or the reasons for not taking action. The Board considers each response, assessing the extent to which the related safety deficiency was addressed by the proposed or completed action. When a recommendation generates responses from within and outside Canada, the Board's assessment is based primarily on the Canadian response. This year, the TSB began making public its assessments of responses to TSB recommendations from industry and government made after 1 January 2005 by publishing them on its website at www.tsb.gc.ca.

FIGURE 4 - BOARD ASSESSMENT OF RESPONSES TO RECOMMENDATIONS ISSUED IN 2005-2006 AND THOSE PENDING FROM 2004-2005

	FULLY SATISFACTORY ATTENTION TO SAFETY DEFICIENCY	SATISFACTORY INTENT TO ADDRESS SAFETY DEFICIENCY	ATTENTION TO SAFETY DEFICIENCY SATISFACTORY IN PART	UNSATISFACTORY ATTENTION TO SAFETY DEFICIENCY
Marine	1	2*	1	0
Pipeline	0	0	0	0
Rail	0	0	0	0
Air	1	0	1	0
TOTAL	2	2	2	0

* includes recommendation M02-04, which was issued in 2002-2003

LIAISON WITH THE CANADIAN TRANSPORTATION COMMUNITY

As part of the TSB's efforts to keep abreast of technological change and to maintain contact with the transportation industry in Canada, TSB staff and Board members attend and participate in various conferences and technical meetings pertinent to transportation safety.

Members of the Board made presentations to the International Helicopter Safety Symposium 2005 in Montréal, Quebec, the Canadian Maritime Pilots' Association in Québec, Quebec, the Operation Lifesaver annual conference in Gatineau, Quebec, and the Canadian Board of Marine Underwriters annual general meeting in Toronto, Ontario. They also attended the Air Canada Pilots Association flight safety conference in Toronto, the Air Transport Association of Canada annual symposium in Montréal, the Helicopter Association of Canada annual convention in Vancouver, British Columbia, the Administrative Tribunal Members' Forum in Ottawa, Ontario, and the Council of Canadian Administrative Tribunals annual conference also in Ottawa. Members of the Board also visited Canadian Pacific Railway's new infrastructure in Kamloops, British Columbia.

In addition, the Executive Director was a guest speaker at the Chief Coroners and Chief Medical Examiners annual conference and the Canadian Business Aviation Association annual training seminar. The Executive Director also attended the Canadian Transportation Agency and Railway Association of Canada annual workshop, the Canadian Aviation Executives' Safety Network annual meeting, Transport Canada's annual Canadian Aviation Safety Seminar, the Air Transport Association of Canada annual symposium and the annual executive meeting of the Association québécoise des transporteurs aériens.

The Director General, Investigation Operations, attended meetings with individual Canadian railway companies and an industry association to discuss matters of mutual interest, and participated in consultative sessions of the Canadian Maritime Law Association, the Canadian Marine Advisory Council, the Air Transport Association of Canada and the National Research Council Aerospace and Surface Transportation organizations. He made presentations to the annual Flightscape Users conference, the 2005 SARSCENE conference (search and rescue issues) and the Transportation of Dangerous Goods Advisory Council annual meeting. He also participated in the International Civil Aviation Organization (ICAO) briefings on results of its audit of Canada's conformance to ICAO obligations.

Marine staff in Vancouver, continue to take a leading role in the Marine Action Group activities whereby safety presentations, which include practical displays of vessel stability characteristics, are made to fishing and other interests. Presentations have also been made to Pacific Marine Training Institute students, the BC Seafood Alliance, the Workers' Compensation Board of British Columbia, the Pacific Prawn Fishermen's Association, the Crab Fishermen's Association, the Hupacasath Native Band Fishers and the Pacific Coast Marine Review Panel. In the Central region, staff attended Canadian Marine Advisory Council meetings (both national and regional), gave presentations on fishing vessel safety and participated in important marine discussions. Other presentations have been given to the Canadian Power and Sail Squadrons, the International Shipmasters' Association convention, the Company of Master Mariners of Canada and the Golden Horseshoe Advisory Group. Quebec staff in the Laurentian region conducted presentations to the biannual meeting on Naval Applications of Materials



Technology and attended a monthly meeting of the Constructeurs et navigateurs amateurs (CONAM). In the Maritimes region, a presentation was made to the Marine Medical Seminar for the Medical Examiners of Seafarers.

Pipeline staff gave presentations on the TSB investigation process to industry representatives both in the Atlantic Provinces and in Alberta. Additionally, they participated in a mock pipeline rupture exercise that involved the National Energy Board, industry, local fire and police departments and other governmental organizations.

Rail staff gave presentations on the TSB and its work at conferences in Moncton, New Brunswick, at Transport Canada's Annual Workshop on Highway-Railway Grade Crossing Research, to coroners' offices, to police organizations and to railway companies. Staff also participated in a mock rail accident in Ottawa, along with municipal representatives, emergency response personnel and industry representatives.

Air staff participated in annual meetings with departments and associations within the aviation community. It also provided formal briefings to Canadian airport fire chiefs attending the Canadian Airport Fire Protection Association meeting in Richmond, British Columbia; to the International Helicopter Symposium in Montréal, on lessons learned from TSB investigations into helicopter accidents; to the Canadian Aerospace Institute on basic helicopter aerodynamics and lessons learned from TSB investigations into helicopter accidents (1994-2003); to Air Canada on the interaction between the TSB and the Air Canada emergency response team after an accident; and to the International Confidential Aviation Safety Systems (ICASS) on SECURITAS (the TSB Confidential Safety Reporting System). The Air Branch improved partnerships and working procedures with other departments and agencies (Transport Canada, NAV CANADA, Foreign Affairs Canada, Canada Border Services Agency, Canadian Air Transport Security Authority, Department of National Defence, National Research Council and ICAO). The Air Branch contributed support to seminars conducted by the Air Canada Pilots Association, the Air Line Pilots Association, the Air Transportation Association of Canada, the American Helicopter Society International, the Canadian Aeronautics and Space Institute, the Canadian Aviation Maintenance Council, the Helicopter Association of Canada, the Northwest Territories Government Airports Group and the International Society of Air Safety Investigators.

The TSB Engineering facilities continued to support occurrence investigations with their core business of timely and quality engineering investigation reports, and provided briefings and support for visits of particular interest to industry groups. This year, the Engineering Branch provided support and was instrumental in the following:

- a briefing to the Department of National Defence Icing Operations Standing Committee;
- worked with Canadian Pacific Railway, DaimlerChrysler Canada and the County of Renfrew following a rail crossing accident;

- during the underwater search and recovery of the Messerschmitt-Bolkow-Blohm BO 105 Canadian Coast Guard helicopter, assisted Canadian Coast Guard ships and helicopters, a Royal Canadian Mounted Police patrol boat, an Irving Oil dive ship and remotely operated vehicles, and the Bedford Institute of Oceanography;
- cooperated with Environment Canada and Canadian National to ensure that the TSB could continue its investigation while Environment Canada and Canadian National were conducting their own independent parallel investigations and is currently negotiating with the National Research Council Chalk River laboratories to use the neutron diffraction method for measuring residual stresses in the rails;
- continued support to the Transport Canada Dangerous Goods Branch, which is looking into tank car failures not being investigated by the TSB.

The Human Performance Division delivered the Human Factors in Investigations course to external participants, including provincial and federal investigative bodies (Canadian Coast Guard, Department of National Defence, Transport Canada and National Energy Board), industry (NAV CANADA, Serco, and WestJet Airlines) and academia (Laurentian University). Human Performance staff also made educational presentations at academic institutions such as the University of Toronto.

The Macro-analysis Division provided support to Transport Canada's multi-disciplinary research project on grade-crossing accidents.

INTERNATIONAL COOPERATION AND KNOWLEDGE TRANSFER

The TSB's mission is to advance transportation safety, not only in Canada, but worldwide. This cooperation comes in many forms, through participation in safety symposiums, international safety organizations and international investigations.

Over the past year, Board members attended the International Aviation Security Conference in Washington, D.C. and visited the U.S. National Transportation Safety Board in Washington, D.C. The Executive Director also participated in that visit and attended the annual meeting of the International Transportation Safety Association (of which Canada is a founding member). Finally, an investigation information management system development memorandum of understanding was signed with the Australian Transport Safety Bureau.

The Marine Branch continued its important work with International Maritime Organization (IMO) committees and sub-committees, particularly the Human Element and Casualty Analysis working group and correspondence group. Marine staff reviewed several international investigation reports, and lessons learned have been submitted to the IMO for global publication. The IMO *Code for the Investigation of Marine Casualties and Incidents* is under review, and Canada is taking a lead role in the recommendation to have the Code become part of the prestigious International Convention for the Safety of Life at Sea (SOLAS). This will improve international cooperation and standardize procedures. Marine staff made two presentations to the Marine Accident Investigators' International Forum at its annual meeting in Port Vila, Vanuatu, where the Code was also addressed in detail by 45 nations. Partnering is being actively sought with other countries concerning the requirements to download and play back voyage data recorder (VDR) information following marine accidents. Marine staff are taking an active role in assuring technical competence by attending and participating in International Electrotechnical Commission meetings in the United Kingdom.

Rail staff attended the Wheel/Rail Interface Seminar in Chicago, Illinois, in May 2005, and the Advanced Hazmat Technician training at the Transportation Technology Center in Pueblo, Colorado, in October 2005. The Rail Branch sent a full set of investigation procedures and standards to the Republic of South Africa, which has just started a new regulatory regime. Informal discussions ensued on the application of the standards. In November 2005, Rail staff attended the International Rail Safety Conference in Cape Town, South Africa, and presented a paper describing lessons learned from three accident investigations to delegates from five countries.

The Air Branch improved communications and cooperation with the investigation agencies of Australia, China, Denmark, Finland, France, Germany, Iceland, the Netherlands, Norway, Portugal, the Republic of Korea, Sweden, the United Kingdom and the United States, and with industry manufacturers Bombardier, Pratt & Whitney Canada, Bell Helicopter, Airbus and Boeing. The Air Branch hosted the annual Nordic Accident Investigation Group meeting, which was attended by accident investigation authorities from Denmark, Finland, Iceland, Norway and Sweden. The Air Branch also participated in the European Aviation Safety Conference and the annual Flight Safety Foundation International Air Safety Seminar.

The Engineering Branch has an excellent working relationship with worldwide investigative agencies and assists, when requested, to complement the capabilities of those agencies with:

- flight data recorder (FDR) analysis and animation to assist in the investigation of the China Eastern CRJ aircraft accident;
- FDR and cockpit voice recorder (CVR) download, analysis and animation in support of the Sky Services B767 accident in Punta Cana, Dominican Republic;
- recorder download and technical support in the landing gear analysis for the Dash 8 accident in Trinidad and Tobago;
- FDR data analysis, flight animation and photogrammetric analysis of aircraft height above terrain and metallurgical work in Toulouse, France, following a CL-415 aircraft accident;
- CVR download for a DHC-6 aircraft accident in Costa Rica;
- as a member of the Accident Investigation Recorders (AIR) Working Group, took part in the international meeting in September 2005;
- as a member of the ICAO Flight Recorder Panel, participated in the international meeting at ICAO;
- for the Air France Airbus accident, worked with the U.S. National Transportation Safety Board (NTSB), France's Bureau d'Enquêtes et d'Analyse pour la Sécurité de l'Aviation Civile (BEA), the United Kingdom Air Accidents Investigation Branch, the U.S. Federal Aviation Administration (FAA) Technical Center, Messier-Bugatti and Goodrich (brake systems), Michelin (tires), Zodiac (aircraft oxygen systems), Airbus, Team (solid state CVR) and Air France;
- technical non-disclosure arrangements were implemented to allow the access to Garmin International's schematics and layout diagrams to examine and retrieve stored data in global positioning system receivers recovered from accident vehicles;
- worked in cooperation with Dukane Seacom in the analysis of underwater acoustic locator beacons and established a working relationship to obtain schematics for future investigation purposes;
- carried out digital flight data recorder (DFDR) and CVR download, analysis and flight animation work, as well as direct access recorder (DAR) analysis and synchronization with DFDR data;
- worked with the aircraft manufacturer (Airbus), as well as with the BEA, the Federal Bureau of Aircraft Accidents Investigation (BFU) of Germany and the NTSB;



- developed the scope of the testing program undertaken by Airbus and partnered with the National Research Council for the composites aspect of the testing and analyses, and made a significant contribution in the publication of the safety advisories that affected the Airbus fleet worldwide;
- following a CL-415 accident in Europe, ensured continued support as the accredited representative from the state of manufacture; and
- ensured continued investigation support into a Pratt & Whitney PT6-20 engine failure on take-off in Australia on a King Air, which then crashed and was consumed by fire.

Human Performance staff participated in human factors working groups at international meetings, including the meeting of the International Maritime Organization in London, England, and chaired a panel session on human factors in helicopter safety and presented a research paper at the International Helicopter Safety Symposium in Montréal.

Macro-analysis staff participated in the International Civil Aviation Organization Safety Indicators Study Group. The Macro-analysis Division also provided several statistical reports to international agencies and industries.

ANNUAL STATISTICS

In all, 480 marine accidents were reported to the TSB in 2005, a 2% decrease from the 2004 total of 492 and a 7% decrease from the 2000–2004 average of 514. Marine fatalities totalled 19 in 2005, down from both the 2004 total and the 2000–2004 average of 28.

Shipping accidents, which comprised 91% of marine accidents, reached a 30-year low of 435 in 2005, down from 442 in 2004 and the five-year average of 456. Nearly half of all vessels involved in shipping accidents were fishing vessels. Accidents to persons aboard ship, which include falls, electrocution, and other types of injuries requiring hospitalization, totalled 45 in 2005, a 10% decrease from the 2004 total of 50 and a 22% decrease from the five-year average of 58.

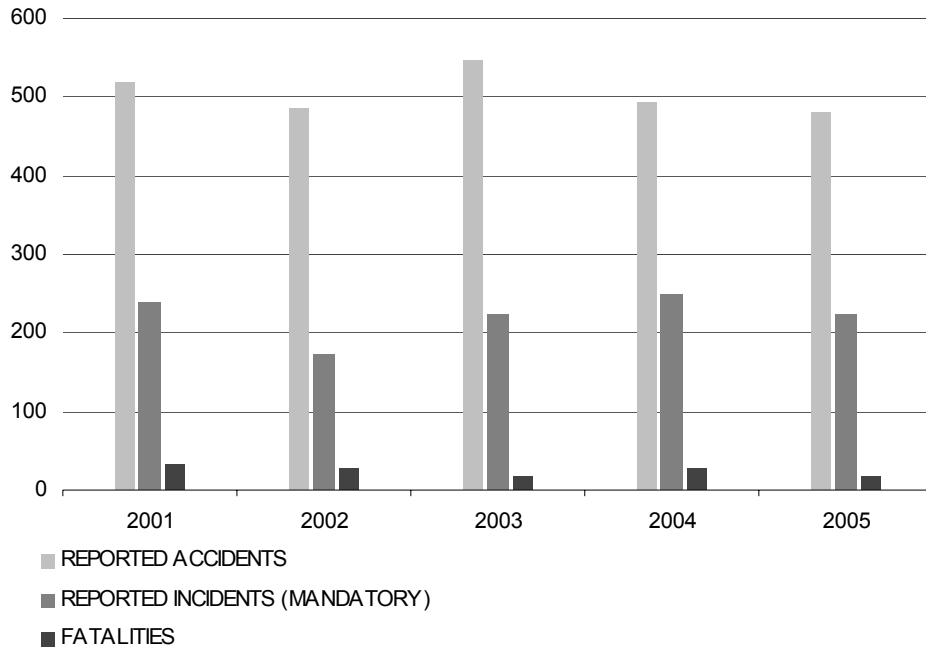
Marine activity for Canadian commercial non-fishing vessels increased by 5% from the 2000-2004 average, resulting in a 7% decrease in the accident rate from 3.0 to 2.8 accidents per 1000 movements. Although marine activity for foreign commercial non-fishing vessels remained relatively unchanged compared to the 2000–2004 average, accidents increased, yielding a 47% increase in the accident rate from 1.5 to 2.2 accidents per 1000 movements.

In 2005, shipping accidents resulted in 12 fatalities, down from 22 in 2004 and the five-year average of 17. Accidents aboard ship resulted in 7 fatalities, up 1 from the 2004 total but down 4 from the five-year average.

Twenty-two vessels were reported lost in 2005, equal to the 2004 total but down from the five-year average of 36.

In 2005, 224 marine incidents were reported in accordance with the TSB mandatory reporting requirements. This represents a 10% decrease from the 2004 total of 248 but is comparable to the five-year average of 226.

FIGURE 5 - MARINE OCCURRENCES AND FATALITIES



MARINE INVESTIGATIONS STARTED IN 2005-2006

Final determination of events is subject to the TSB's full investigation.

DATE	LOCATION	VESSEL(S)	TYPE	EVENT	OCCURRENCE NO.
2005.05.14	Elaho River, B.C.	(no name)	Inflatable river raft	Capsizing	M05W0080
2005.06.03	Canadian Pacific Railway bridge, South Shore Canal, St. Lawrence Seaway, Que.	<i>Federal Sakura</i>	Bulk carrier	Striking	M05C0019
2005.06.03	Swanson Channel, North Pender Island, B.C.	<i>Sandra Carol Warrior Ocean Warrior Barge 216</i>	Fishing Barge Tug Barge	Collision	M05W0087
2005.06.09	Okanagan Lake, B.C.	<i>Quintana Roo</i>	Houseboat	Capsizing	M05W0090
2005.06.27	Wood Islands, P.E.I.	<i>Confederation</i>	Roll-on/roll-off passenger ferry	Serious injury	M05M0052
2005.06.29	Off Savary Island, Northern Georgia Strait, B.C.	<i>Morning Sunrise</i>	Fishing	Capsizing and subsequent sinking	M05W0110
2005.06.30	Sewell's Marina, Horseshoe Bay, B.C.	<i>Queen of Oak Bay</i>	Passenger and vehicle ferry	Striking and grounding	M05W0111
2005.07.19	South Shore Canal, St. Lawrence Seaway, Que.	<i>Jo Spirit Orla</i>	Chemical tanker General cargo	Collision	M05C0033
2005.07.26	Off Cape Flattery, Pacific Ocean	<i>Ocean Tor</i>	Fishing	Capsizing	M05W0141
2005.09.12	Near buoy K-120, Traverse du Nord, off Saint-François wharf, Que.	<i>Maria Desgagnés El Tio</i>	Chemical tanker Yacht (sail)	Collision	M05L0192



DATE	LOCATION	VESSEL(S)	TYPE	EVENT	OCCURRENCE NO.
2005.09.12	70 nm east of Cape Bonavista, N.L.	<i>Melina & Keith II</i>	Fishing	Capsizing	M05N0072
2005.09.26	St. Lawrence River, Deschailions, Que.	<i>Canadian Leader</i>	Bulk carrier	Grounding and taking water	M05L0203
2005.09.26	St. Lawrence River, near Yamachiche, Que.	<i>Hyde Park Cast Prosperity</i>	Chemical tanker Container	Collision	M05L0205
2005.10.28	Between buoys P19 and P17, St. Marys River, Ont.	<i>Michipicoten</i>	Bulk/oil carrier	Grounding	M05C0063
2006.01.04	Gaspé, Que.	<i>Skalva</i>	General cargo	Fire/Explosion	M06L0004
2006.03.08	Qualicum, B.C.	<i>B.C. Safari</i>	Fishing	Capsizing	M06W0039
2006.03.22	Juan Point, Gil Island, B.C.	<i>Queen of the North</i>	Passenger and vehicle ferry	Grounding and sinking	M06W0052



MARINE REPORTS RELEASED IN 2005-2006

DATE	LOCATION	VESSEL(S)	TYPE	EVENT	REPORT NO.
2002.08.04	Strait of Georgia, B.C.	<i>Statendam</i>	Passenger	Switchboard fire	M02W0135
2002.10.12	South Shore Canal, St. Lawrence Seaway, Que.	<i>Canadian Prospector Stellanova</i>	Bulk carrier Heavy lift	Collision	M02C0064
2003.05.03	Outside St. John's Harbour, N.L.	<i>Sir Wilfred Grenfell Genny and Doug</i>	Canadian Coast Guard Fishing	Collision	M03N0047
2003.05.12	Queen Charlotte Channel, B.C.	<i>Queen of Surrey</i>	Roll-on/roll-off passenger ferry	Engine room fire	M03W0073
2003.05.12	Port aux Basques, N.L., 8 nm S	<i>Joseph and Clara Smallwood</i>	Roll-on/roll-off passenger ferry	Fire on vehicle deck	M03N0050
2003.06.25	Off Petit-de-Grat, N.S.	<i>Silent Provider</i>	Small fishing	Fire and sinking	M03M0077
2004.03.04	North Sydney, N.S., 14 nm NNE	<i>Caribou</i>	Roll-on/roll-off passenger ferry	Furnace explosion - starboard auxiliary boiler	M04M0013
2004.04.27	Sorel, Que.	<i>Catherine-Legardeur</i>	Passenger and vehicle ferry	Grounding	M04L0050
2004.06.19	Sherbrooke, Que.	(no name)	Inflatable river raft	Capsizing	M04L0066
2004.08.11	Off Saint-Nicolas, Que.	<i>Canada Senator Mondisy</i>	Container Pleasure craft	Collision	M04L0099
2004.08.24	Public wharf, île aux Coudres, Que.	<i>Famille Dufour II</i>	High-speed passenger catamaran	Striking of wharf	M04L0105
2005.06.27	Wood Islands, P.E.I.	<i>Confederation</i>	Roll-on/roll-off passenger ferry	Serious injury	M05M0052



MARINE RECOMMENDATIONS ISSUED IN 2005-2006

Strait of Georgia, British Columbia – 4 August 2002
Switchboard Fire – Passenger Vessel *Statendam*

Report No. M02W0135

RECOMMENDATION	RESPONSE	BOARD ASSESSMENT OF RESPONSE	SAFETY ACTION TAKEN
M05-01 The Department of Transport submit a paper to the International Maritime Organization requesting a review of requirements for structural fire protection and fire-extinguishing systems to ensure that the fire risks associated with compartments containing high levels of electrical energy are adequately assessed, and that the provisions of the International Convention for the Safety of Life at Sea (SOLAS) dealing with structural fire protection and fixed fire-extinguishing systems are addressed.	Transport Canada (TC) believes that the TSB should prepare an information paper on the issue and TC would submit it to the International Maritime Organization (IMO) Fire Protection Sub-Committee at the next meeting in January 2006.	Fully Satisfactory	TC agreed to submit an information paper (as drafted by TSB staff) to the IMO Fire Protection Sub-Committee that will call for a review to ensure that the fire risks associated with compartments containing high levels of electrical energy are adequately assessed and addressed by the provisions of SOLAS. The paper, dated 4 October 2005, was submitted to the IMO.

Off Petit-de-Grat, Nova Scotia – 25 June 2003
Fire and Sinking – Small Fishing Vessel *Silent Provider*

Report No. M03M0077

RECOMMENDATION	RESPONSE	BOARD ASSESSMENT OF RESPONSE	SAFETY ACTION TAKEN
M05-02 The Department of Transport, in conjunction with the manufacturer, ensure that all present and future owners of Ovatek liferafts receive information that will allow users to properly de-water and right a swamped liferaft and encourage all users to practice these procedures.	The Minister of Transport accepts the recommendation. TC is working with the manufacturer to ensure that information on de-watering is provided to all current and future owners of Ovatek liferafts.	Satisfactory Intent	TC is to follow up with the manufacturer in early March 2006 before the commencement of the 2006 fishing season to confirm that the proposed actions have been completed. The revisions to training are to be implemented with the new proposed Marine Personnel Regulations in November 2006.



RECOMMENDATION	RESPONSE	BOARD ASSESSMENT OF RESPONSE	SAFETY ACTION TAKEN
<p>M05-03 The Department of Transport develop and implement performance-based standards to ensure that all liferafts deployed on Canadian vessels are capable of operating in severe marine conditions and, further, encourage the International Maritime Organization to adopt a parallel approach internationally.</p>	<p>As part of the revisions to the Marine Emergency Duties Training Program and Marine Emergency Duties A3/A4 courses, TC will introduce special training, where applicable, concerning the boarding of a rigid liferaft.</p> <p>The Minister of Transport notes the recommendation, and TC will continue to work with the IMO to improve the testing and performance criteria of all survival equipment. Currently, work at the IMO is focused on improving the testing criteria for lifeboats and release mechanisms, as this has been a concern internationally and domestically.</p> <p>TC is planning to carry out research regarding thermal requirements of liferafts. The current IMO standards specify a need for insulated floors and canopies in liferafts without specifying the value of thermal protection required. This research will assist in improving the performance criteria of liferafts.</p>	<p>Satisfactory in Part</p>	<p>There is no indication in the response of any other domestic initiative under consideration or being taken regarding liferaft-related testing and performance criteria for operating in more severe marine conditions. However, TC is working at the international level through the IMO to further improve the testing and performance criteria of survival equipment. The development of goal- or performance-based standards is well under way within the IMO to address a variety of maritime matters. A correspondence group of the IMO Sub-Committee on Ship Design and Equipment (48th session, 21–25 February 2006) is expected to prepare performance requirements for survival craft used on future passenger ships.</p>

RECOMMENDATION	RESPONSE	BOARD ASSESSMENT OF RESPONSE	SAFETY ACTION TAKEN
M05-04 The Department of Transport ensure that the Board's previous recommendations M03-05 and M03-06 are immediately implemented.	Until such time as the new Fishing Vessel Safety Regulations come into force, TC has established an interim measure for determining, based on a list of risk factors, whether a small fishing vessel requires a stability booklet. This interim measure, which will take effect immediately and apply to new and existing vessels, will require that a stability booklet be on board all vessels that have any of the identified risk factors.	Pending	To be reported next fiscal year

RECOMMENDATION	RESPONSE	BOARD ASSESSMENT OF RESPONSE	SAFETY ACTION TAKEN
M05-05 The Department of Transport, in conjunction with other stakeholders, review Canadian and international marine regulations respecting fixed fire-extinguishing systems to ensure that their design, maintenance, inspection, and testing regimes effectively demonstrate continued structural and functional integrity.	Awaiting response	Pending	To be reported next fiscal year

RECOMMENDATION	RESPONSE	BOARD ASSESSMENT OF RESPONSE	SAFETY ACTION TAKEN
M05-06 The Department of Transport require Canadian passenger vessels over 500 gross tonnage to meet a standard of structural fire protection that ensures a level of safety equivalent to SOLAS-compliant vessels.	Awaiting response	Pending	To be reported next fiscal year

ASSESSMENT OF RESPONSE TO A MARINE RECOMMENDATION ISSUED IN 2002-2003

RECOMMENDATION	RESPONSE	BOARD ASSESSMENT OF RESPONSE	SAFETY ACTION TAKEN
M02-04 The Department of Transport ensure that overall preparedness is appropriate for responding to vessel-related emergencies within the Seaway.	<p>The Minister of Transport, under the <i>Canada Marine Act</i>, does have responsibility for the safety oversight of the Canadian marine transportation system in general; however, the <i>Canada Marine Act</i> does not provide a safety oversight role to the Minister in respect to the Seaway.</p> <p>Responsibility for emergency/contingency plans specific to the Seaway falls under the purview of the St. Lawrence Seaway Management Corporation (SLSMC).</p>	Satisfactory Intent	As a result of discussions between TC and the SLSMC, it has been decided to amend the Management, Operation and Maintenance Agreement. It is intended that the amendment will require the SLSMC to have in place an up-to-date emergency response plan. The plan will have to be validated every five years by a qualified independent third party, and copies of their report will be forwarded to TC and the SLSMC. The SLSMC will continue to conduct annual emergency response exercises.

The Marine Branch 2005 annual review of assessments of responses to TSB marine recommendations was approved by the Board in December 2005. The annual review of assessments of responses was conducted on 57 “active” recommendations. Consequently, the Board approved the 2005 review, which assigned 20 recommendations to “inactive” status – the remaining 37 recommendations being “active.” Five recommendations issued subsequent to the Board’s approval of the 2005 review were not included in the review.

OTHER MARINE SAFETY ACTION TAKEN

Transport Canada (TC) issued Ship Safety Bulletin 01/2005, *The Use of Passive Anti-Roll Tanks (ART) on Small Fishing Vessels*, to caution operators of vessels fitted with passive anti-roll tanks about the safety hazards associated with their use.

The Canadian General Standards Board published its amended standard CAN/CGSB-65.16-2005, *Immersion Suit Systems*. The amended standard requires that information concerning the donning, fitting, operation, maintenance and cleaning of the suit system be made available to purchasers at the point of sale.

A West Coast marine insurance company advised its members of the potential deficiencies associated with the use of single crossbar type hatch covers.

TC completed special audits with respect to operational readiness on board some passenger ferries operating in Canada.

TC is reviewing all fire safety regulatory requirements, together with other international standards. Low-location lighting, emergency lighting and supplemental lighting requirements will be included in the review. TC anticipates that the new Fire Safety Regulations will come into force by November 2006.

The ferry operator Northumberland Ferries Ltd. made modifications to the control levers of a horizontal sliding door to make the operation of the door easier; the lever now actuates the door in the same direction of travel and the handles are now very close to the door opening. The time required for the horizontal watertight door to close from fully opened was also adjusted to 26 to 30 seconds as per the manufacturer’s specifications.

The Canadian Coast Guard issued Fleet Bulletin 06-2005, *Concerns about Stability of Aluminum Barges*, to its fleet personnel to remind them to give careful consideration to the impact of cargo handling work on stability and the vessel’s operating restrictions.



PIPELINE

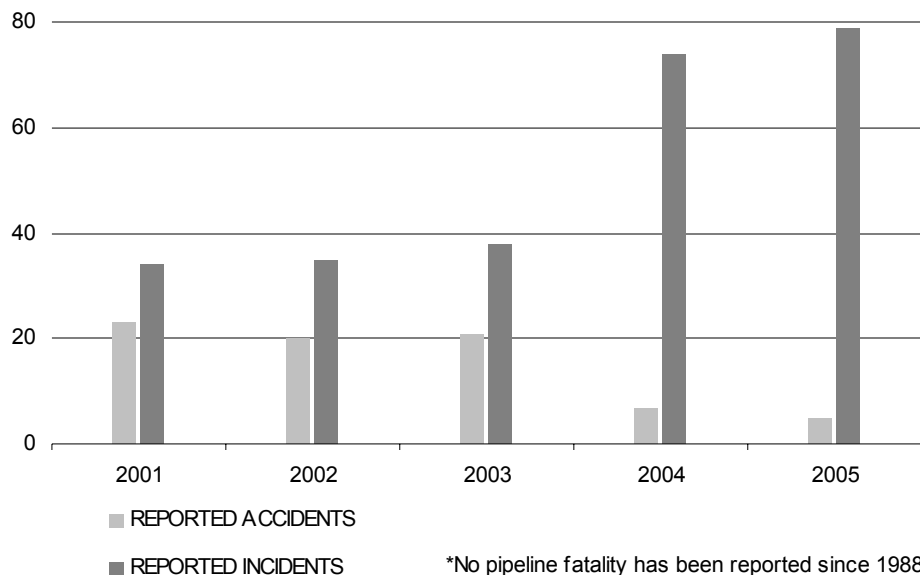
Occurrence Statistics and Investigations

ANNUAL STATISTICS

In 2005, 5 pipeline accidents were reported to the TSB, down from the 2004 total of 7 and from the 2000–2004 average of 16. Pipeline activity is estimated to have decreased by 1% from the previous year. The accident rate decreased to 0.4 pipeline accidents per exajoule in 2005, down from 0.5 in 2004 and the 2000–2004 average rate of 1.48. The last fatal pipeline accident in the portion of the industry under federal jurisdiction occurred in 1988, and the last accident involving serious injury occurred in 2000.

In 2005, 79 pipeline incidents were reported in accordance with the TSB mandatory reporting requirements, up from 74 in 2004 and from the five-year average of 44. In all, 90% of those incidents involved uncontained or uncontrolled release of small quantities of gas, oil and high-vapour-pressure products.

FIGURE 6 - PIPELINE OCCURRENCES



PIPELINE INVESTIGATIONS STARTED IN 2005-2006

Final determination of events is subject to the TSB's full investigation.

DATE	LOCATION	COMPANY	EVENT	OCCURRENCE NO.
2005.07.15	Abbotsford, B.C.	Terasen Pipelines Inc.	Uncontained release – crude oil pipeline	P05H0044
2005.10.18	Empress, Alta.	Foothills Pipe Lines Ltd.	Programmable logic controller failure at decompression/recompression facility	P05H0061

PIPELINE REPORT RELEASED IN 2005-2006

DATE	LOCATION	COMPANY	EVENT	REPORT NO.
2002.12.07	Near Saint-Clet, Que.	Trans-Northern Pipelines Inc.	Refined product pipeline rupture	P02H0052

No pipeline recommendations were issued in 2005-2006.



ANNUAL STATISTICS

A total of 1246 rail accidents were reported to the TSB in 2005, a 9% increase from the 2004 total of 1138 and an 18% increase from the 2000–2004 average of 1055. Rail activity is estimated to have increased by 3% over 2004 and by 6% over the five-year average. The accident rate increased to 13.0 accidents per million train-miles in 2005, compared to 12.3 in 2004 and the five-year rate of 11.7. Rail-related fatalities totalled 103 in 2005, compared to 101 in 2004 and the five-year average of 93.

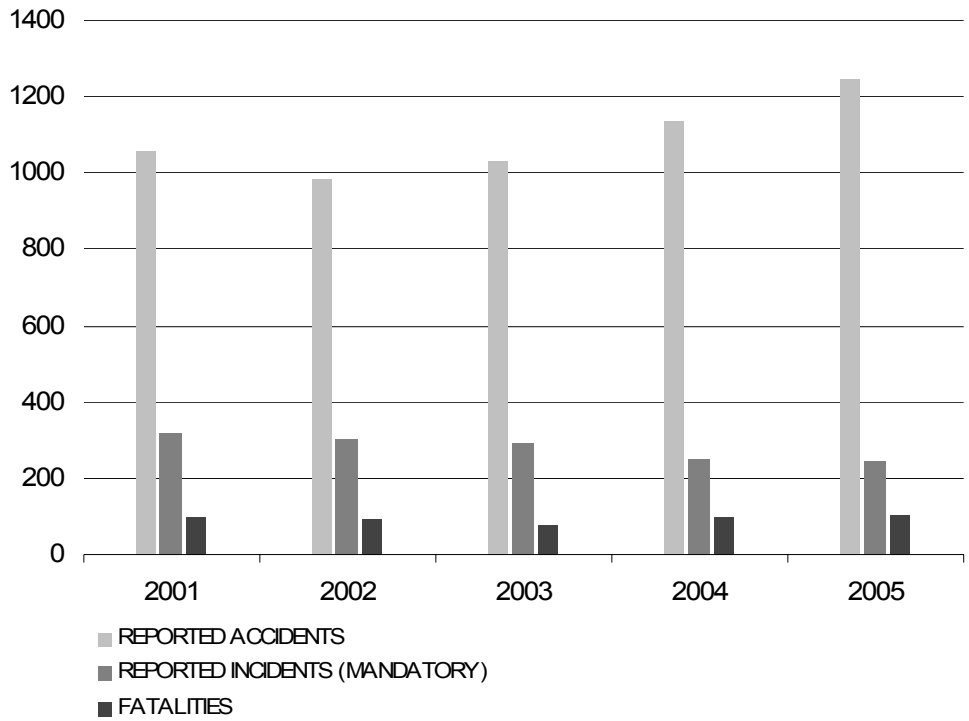
Six main-track collisions occurred in 2005, compared to five in 2004 and the five-year average of seven. In 2005, there were 195 main-track derailments, a 28% increase from the 2004 total of 152 and a 47% increase from the five-year average of 133. Non-main-track derailments also showed a significant increase in 2005, totalling 538 compared to 450 in 2004 and the five-year average of 392.

In 2005, crossing accidents increased to 270 from the 2004 total of 237 and from the five-year average of 258. Crossing-related fatalities numbered 38, up from 25 in 2004 and the five-year average of 35. Trespasser accidents showed a 17% decrease from 2004, from 99 to 82, but a 4% increase over the five-year average of 79. With a total of 63 fatalities in 2005, trespasser accidents continue to account for the majority of rail fatalities.

In 2005, 215 rail accidents involved dangerous goods (this also includes crossing accidents in which the motor vehicle is carrying a dangerous good), up from 208 in 2004 but down from the five-year average of 222. Six of these accidents resulted in a release of product.

In 2005, rail incidents reported under the TSB mandatory reporting requirements reached a 23-year low of 244, down from 252 in 2004 and the five-year average of 300. Dangerous goods leakers not related to train accidents account for the largest proportion of total incidents each year. In 2005, dangerous goods leakers decreased to 124 from the 2004 total of 131 and from the five-year average of 166.

FIGURE 7 - RAIL OCCURRENCES AND FATALITIES



RAIL INVESTIGATIONS STARTED IN 2005–2006

Final determination of events is subject to the TSB's full investigation.

DATE	LOCATION	COMPANY	EVENT	OCCURRENCE NO.
2005.05.02	Maxville, Ont.	Ottawa Central Railway	Runaway and main-track train collision	R05H0011
2005.05.27	Bowden, Alta.	Canadian Pacific Railway	Main-track train derailment	R05C0082
2005.07.04	Prescott, Ont.	Canadian National	Main-track train derailment	R05H0013
2005.07.13	Calgary, Alta.	Canadian National	Non-main-track train derailment and collision	R05C0116
2005.07.31	Val-d'Or, Que.	Canadian National	Main-track train derailment	R05Q0033
2005.08.03	Wabamun, Alta.	Canadian National	Main-track train derailment	R05E0059
2005.08.05	Swift, B.C.	Canadian National	Main-track train derailment	R05V0141
2005.08.22	Monet, Que.	VIA Rail Canada Inc.	Crossing accident	R05Q0040
2006.01.31	Buckskin, Ont.	Canadian Pacific Railway	Main-track train derailment	R06T0022

RAIL REPORTS RELEASED IN 2005-2006

DATE	LOCATION	COMPANY	EVENT	REPORT NO.
2003.10.24	Near Cranbrook, B.C.	Canadian Pacific Railway	Main-track train derailment	R03C0101
2004.01.22	Bolton, Ont.	Canadian Pacific Railway	Main-track train derailment	R04T0013
2004.02.07	Montmagny, Que.	Canadian National	Main-track train derailment	R04Q0006
2004.03.04	Red Deer, Alta.	Canadian Pacific Railway	Main-track train derailment	R04E0027
2004.04.18	Linacy, N.S.	Cape Breton and Central Nova Scotia Railway	Main-track train derailment	R04M0032
2004.06.28	Munster, Ont.	VIA Rail Canada Inc.	Crossing collision	R04H0009
2004.08.08	Estevan, Sask.	Canadian Pacific Railway	Non-main-track train derailment	R04W0148
2004.10.24	Floods, B.C.	Canadian Pacific Railway	Main-track train derailment	R04V0173
2004.11.12	Lévis, Que.	Canadian National	Main-track train derailment	R04Q0047

No rail recommendations were issued in 2005-2006.

ASSESSMENT OF RESPONSES TO RAIL RECOMMENDATIONS

The railway industry and the regulator provided updated information as to the response to TSB Rail Branch recommendations. The response to recommendations was reassessed for all 118 recommendations issued since 1991. The information provided prompted reassessment of active recommendations that were being monitored for industry response. The number of active recommendations was reduced from 54 to 26.

OTHER RAIL SAFETY ACTION TAKEN

In response to a Transport Canada (TC) Notice and Order issued by a TC Railway Safety Inspector, Canadian National (CN) took measures to ensure the accuracy of train journals. CN installed additional cameras to monitor cars during switching in rail yards and enhanced automatic car identification systems technology to facilitate prompt correction of any errors between train journals and clearing trains.

Subsequent to a derailment caused by truck hunting at speeds over 50 mph by gondola wood chip cars (TSB Report R04Q0006), the Board expressed concern that these particular cars, which are not equipped with supplementary stabilization systems, are prone to truck hunting at speeds in excess of 50 mph and present a risk of derailment. "Truck hunting" is rapid oscillation of an empty car truck at high speeds, where the flanges tend to ride up on the head of the rail.

Subsequent to a derailment in Bolton, Ontario, at a location with a combination of adverse track conditions (TSB Report R04T0013), Canadian Pacific Railway (CPR) identified two additional track geometry defect types to be measured by the CPR track evaluation car. The new defect types take into consideration the effect of a combination of cross-level and alignment deficiencies and a combination of the train speed exceeding the design speed on a curve with unbalanced superelevation.

The TSB issued a Rail Safety Advisory subsequent to a crossing accident at Castleford, Ontario (TSB Report R04H0014). The advisory discusses the changing of the crossing warning signals from left-hand to right-hand orientation as viewed by an approaching motorist. This change was done to comply with a new standard that crossing signals be right-hand oriented. However, the curvature of the approaching roadway mandated that the signals be left-hand oriented to provide a better sightline of the signals when approaching. Left-hand oriented signals are in the process of being installed at that crossing.

After several derailments involving a breach of containment in tank cars loaded with anhydrous ammonia and subsequent exposure injury, including fatal injury, the classification of anhydrous ammonia is being changed from Class 2.2, non-flammable and non-toxic gases, to Class 2.3, toxic gases, with a sub-class 8, corrosive. The revisions to the *Transportation of Dangerous Goods Regulations* are to be mandatory after 15 August 2006.

Subsequent to a derailment in Estevan, Saskatchewan, CPR developed and distributed a "Tech Tip" poster across its system to illustrate what to look for when inspecting freight car centre plates and side bearings (TSB Report R04W0148). CPR instructed all certified car inspectors to review the poster. As well, CPR developed and implemented a system-wide risk assessment process that requires its Engineering and Field Operations departments to jointly perform a risk assessment on the track condition before any significant operational changes or when traffic is expected to increase substantially.

TC-approved *Railway Locomotive Inspection and Safety Rules* were revised, effective January 2006, with changes to the criteria and timeliness of safety inspections on locomotives.

TC developed a *Canadian Road/Railway Grade Crossing Detailed Safety Assessment Field Guide* (TP 14372E), dated April 2005, to promote enhanced pedestrian crossing protection as part of its compliance, awareness and research programs, and to guide persons performing grade crossing assessments.

Subsequent to the complete fracture and failure of a draft gear stop block in a dangerous commodities tank car (TSB Occurrence R04H0018), which was fortunately caught by inspection, the TSB Engineering Laboratory conducted a failure analysis of the fractured steel. It was determined that the stop block did not conform to the applicable Association of American Railroads (AAR) standard. A TSB Rail Safety Information Letter with this information was forwarded to the AAR for its perusal.

The AAR revised Standard S-580, *Locomotive Crashworthiness Requirements*, effective July 2005, to include requirements for car body-to-truck attachment and for emergency interior lighting on locomotives manufactured after 2008.

In response to a TSB Rail Safety Advisory and a Rail Safety Information Letter concerning improper loading of steel products on flat cars, CN set off all line shipments of such steel products to confirm that the loading was in compliance with the AAR rules. CN took measures to ensure that shippers of such steel products reviewed the proper loading requirements and provided copies of the required loading patterns. The AAR developed revisions to the *Open Top Loading Rules* to clarify the guidelines for such loads, and published the revisions in AAR Circular Letter C-10146.

In response to a TSB Rail Safety Advisory concerning shattered rim defects in Southern CH36 wheels manufactured in 1995 and the resultant derailments, the AAR declared that those wheels must be removed from the North American car fleet whenever the cars are in a repair shop and must not be put on another car. The *Field Manual of the AAR Interchange Rules* was revised accordingly. CN and CPR initiated programs that go beyond the requirements of the AAR. They are removing all Southern wheels from their equipment and have instructed their suppliers not to install Southern wheels on any cars owned or leased by them.

ANNUAL STATISTICS

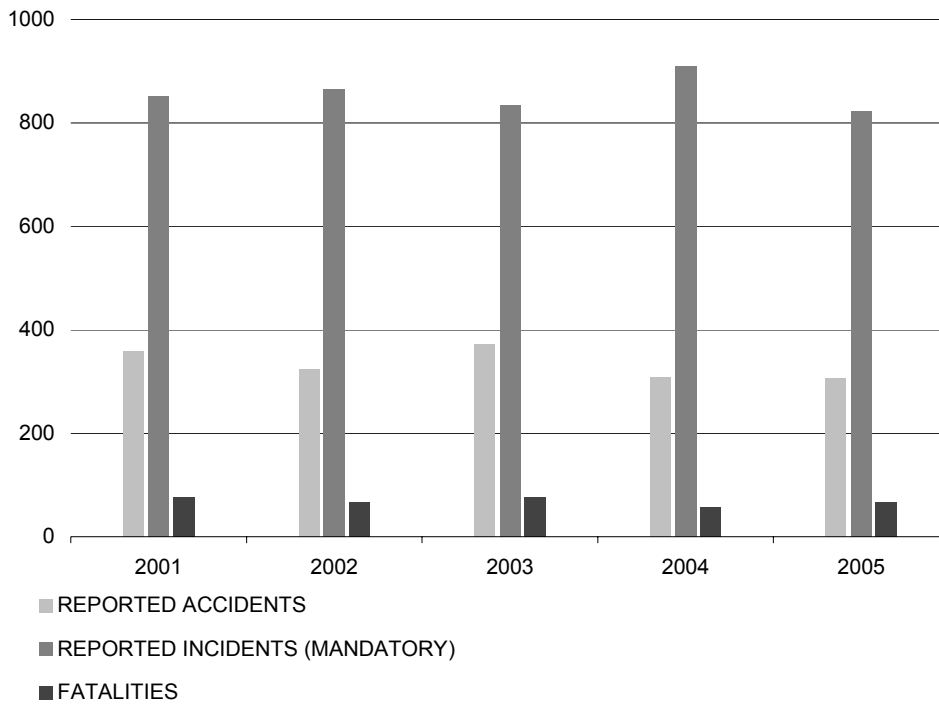
Canadian-registered aircraft, other than ultralights, were involved in 258 reported accidents in 2005, a 2% increase from the 2004 total of 252 but a 10% decrease from the 2000–2004 average of 287. The estimate of flying activity for 2005 is 3 832 000 hours, yielding an accident rate of 6.7 accidents per 100 000 flying hours, up from the 2004 rate of 6.5 but down from the five-year rate of 7.3. Canadian-registered aircraft, other than ultralights, were involved in 34 fatal occurrences with 51 fatalities in 2005, higher than the 24 fatal occurrences with 37 fatalities in 2004 but comparable to the five-year average of 32 fatal occurrences with 54 fatalities. A total of 20 fatal occurrences involved privately operated aircraft (13 aeroplanes, 6 helicopters and 1 glider), and 12 of the remaining 14 fatal occurrences involved commercial operators (9 aeroplanes and 3 helicopters).

The number of accidents involving ultralights decreased to 30 in 2005 from 36 in 2004, and the number of fatal accidents decreased slightly to 5 in 2005 from 6 in 2004.

The number of foreign-registered aircraft accidents in Canada decreased to 18 in 2005 from 20 in 2004. Fatal accidents increased to 6 in 2005, from 3 in 2004.

In 2005, a total of 823 incidents were reported in accordance with the TSB mandatory reporting requirements. This represents a 9% decrease from the 2004 total of 909 and a 2% decrease from the 2000–2004 average of 837.

FIGURE 8 - AIR OCCURRENCES AND FATALITIES



AIR INVESTIGATIONS STARTED IN 2005-2006

Final determination of events is subject to the TSB's full investigation.

DATE	LOCATION	AIRCRAFT TYPE	OCCURRENCE NO.
2005.04.12	Vicinity of High Lake, Nun.	Lockheed L382G Hercules	A05W0059
2005.04.22	Comox, B.C.	Piper PA-31-350	A05P0080
2005.05.07	Bella Bella, B.C.	Messerschmitt-Bolkow-Blohm BO 105 (helicopter)	A05P0103
2005.05.27	St. John's, N.L.	de Havilland DHC-8-100	A05A0059
2005.06.02	Toronto/Lester B. Pearson International Airport, Ont.	Raytheon/Hawker 800 XP	A05O0112
2005.06.07	Tofino, B.C., 5 nm W	Bombardier DHC-8-402	A05P0132
2005.06.09	Hamilton, Ont.	Cessna TU206 G	A05O0120
2005.06.10	Richards Landing, Ont.	Bell 212 (helicopter)	A05O0115
2005.06.10	COUTS Intersection, Lethbridge, Alta., 41 nm SE	Bombardier CRJ705	A05W0109
2005.06.15	Abbotsford, B.C., 15 nm N	Bombardier DHC-8-402	A05P0137
2005.06.18	Burntwood River Seaplane Base, Thompson, Man.	Stinson 108-1	A05C0109
2005.06.19	Abbotsford International Airport, B.C.	Piper PA-44-180 Seminole Piper PA-44-180 Seminole	A05P0143
2005.06.24	Courtenay, B.C., 10 nm N	Robinson R22 Beta (helicopter)	A05P0154
2005.06.24	Yellowknife, N.W.T.	de Havilland DHC-3T (Otter)	A05W0127
2005.06.25	Oshawa Airport, Ont.	Progressive Aerodyne Inc. SeaKey	A05O0125
2006.07.06	Andrew, Alta., 9 nm W	Piper PA-18	A05W0137
2005.07.10	Moose Jaw, Sask.	Waco UPF-7 Wolf-Samson	A05C0123
2005.07.10	Sudbury, Ont.	Bell 204B (helicopter)	A05O0142
2005.07.16	Lac de la Solitude, Que.	Bell 205A-1 (helicopter)	A05Q0119
2005.07.18	Orillia Airport, Ont., 5 nm E	Cessna 185F (seaplane)	A05O0146

DATE	LOCATION	AIRCRAFT TYPE	OCCURRENCE NO.
2005.07.18	Constance Lake, Ont.	Cessna A185F (seaplane)	A05O0147
2005.07.28	Shovelnose Creek, B.C.	Raytheon Beechcraft King Air 200	A05P0189
2005.08.02	Toronto/Lester B. Pearson International Airport, Ont.	Airbus 340-313	A05H0002
2005.08.02	Terrace, B.C., 35 nm NW	MD Helicopters 500D (helicopter)	A05P0184
2005.08.09	Vicinity of 69° N 089° W, Nun.	Boeing 747-400 Airbus A340-500	A05C0153
2005.08.09	Sundre, Alta., 8 nm SE	Lancair IV-P	A05W0160
2005.08.22	Mount Burns, Alta.	Cessna 180	A05W0176
2005.09.01	Schefferville, Que., 20 nm NW	de Havilland DHC-2 Beaver	A05Q0157
2005.09.10	Loretto, Ont.	Pezetel SZD-50-3 Puchacz (glider)	A05O0204
2005.09.17	Duncan, B.C., 1 nm S	Enstrom 280C (helicopter)	A05P0227
2005.09.28	Tumbler Ridge, B.C., 21 nm SE	Bell 205A-1 (helicopter)	A05W0205
2005.09.29	Lac Ouimet, Que.	Cessna 185 (seaplane)	A05Q0178
2005.09.30	Kashechewan, Ont.	Piper PA-31 Navajo	A05O0225
2005.10.06	Winnipeg, Man.	Cessna 208B Caravan	A05C0187
2005.10.26	Devils Lake, B.C.	Bell 206B (helicopter)	A05P0262
2005.10.30	Calgary International Airport, Alta.	Boeing 737-900	A05W0222
2005.11.03	Bella Coola, B.C., 20 nm SE	Boeing Vertol BV-107 II	A05P0269
2005.11.06	Thetford Mines, Que., 10 nm NE	Cessna 172M	A05Q0208
2005.11.15	Hamilton Airport, Ont.	Gulfstream 100	A05O0257
2005.11.20	Brantford, Ont.	Ryan Aeronautical Navion B	A05O0258
2005.12.07	Marystown, N.L., 3 nm SE	Messerschmitt-Bolkow-Blohm BO 105 (helicopter)	A05A0155
2005.12.19	Edmonton International Airport, Alta., 70 nm N	Canadair CL-600-2B19 (RJ) Boeing 737-700	A05W0248



DATE	LOCATION	AIRCRAFT TYPE	OCCURRENCE NO.
2005.12.20	Terrace, B.C.	Mitsubishi MU-2B-36	A05P0298
2005.12.25	Halifax International Airport, N.S.	Boeing 737-700	A05A0161
2005.12.26	Winnipeg International Airport, Man.	Airbus A319-100	A05C0222
2006.01.05	Norman Wells, N.W.T.	Douglas C-54G	A06W0002
2006.01.21	Port Alberni, B.C., 11 nm SSE	Cessna 208B	A06P0010
2006.01.30	Las Vegas, Nevada, United States	Airbus A319-100	A06F0014
2006.03.08	Powell River, B.C.	Piper PA-31-350	A06P0036
2006.03.21	Zama Lake, Alta., 25 nm NW	McDonnell Douglas 600N (helicopter)	A06W0041



AIR REPORTS RELEASED IN 2005-2006

DATE	LOCATION	AIRCRAFT TYPE	EVENT	REPORT NO.
2002.12.07	Toronto/Lester B. Pearson International Airport, Ont.	Airbus A321-211	Roll oscillations on landing	A02O0406
2003.03.11	Kelowna Airport, B.C.	Boeing 737-200	In-flight engine failure	A03P0054
2003.04.07	Lake Temagami, Ont.	Found Brothers FBA-2C1	Stall/spin and collision with terrain	A03O0088
2003.05.22	Active Pass, B.C.	de Havilland DHC-3 (Otter) Sikorsky S-76A (helicopter)	Risk of collision	A03P0113
2003.07.07	Toronto/City Centre Airport, Ont., 3 nm SE	Beech 58TC Baron	Controlled flight into terrain	A03O0171
2003.07.26	Québec, Que.	Cessna 172M	Fuel exhaustion and forced landing	A03Q0109
2003.08.17	Bonaparte Lake, B.C.	Bell 204B (helicopter)	Loss of engine power - collision with terrain	A03P0247
2003.11.04	Ottawa/Macdonald-Cartier International Airport, Ont.	de Havilland DHC-8-102	Elevator control restriction at take-off	A03O0302
2004.01.26	Toronto/Lester B. Pearson International Airport, Ont.	Boeing 767-233	Aircraft pitch-up/stall warning on departure	A04O0020
2004.02.25	Edmonton International Airport, Alta.	Boeing 737-210C	Landing beside the runway	A04W0032
2004.03.03	Vancouver International Airport, B.C.	Boeing 737-200 Cessna 182	Risk of collision on the runway	A04P0047
2004.03.31	Québec/Jean-Lesage International Airport, Que.	de Havilland DHC-8-300	Control difficulty	A04Q0041
2004.04.07	London International Airport, Ont., 5 nm N	Cessna 172 Boeing 737-200	Risk of collision	A04O0092



DATE	LOCATION	AIRCRAFT TYPE	EVENT	REPORT NO.
2004.04.19	Chibougamau/ Chapais Airport, Que.	Beechcraft A100 Beechcraft B100	Runway excursion	A04Q0049
2004.04.22	Timmins, Ont.	Raytheon B300 (Super King Air)	Aircraft stall during instrument approach	A04O0103
2004.04.28	Tasu Creek, B.C.	Bell 206L (helicopter)	In-flight power loss	A04P0142
2004.05.05	Vancouver International Airport, B.C., 4 nm S	de Havilland DHC-8-100 de Havilland DHC-2 Mk 1 Beaver	Air proximity - safety not assured	A04P0153
2004.05.18	Fawcett Lake, Ont.	de Havilland DHC-2 Mk 1 Beaver	Loss of control and collision with terrain	A04C0098
2004.05.28	Moncton, N.B.	Boeing 727-225	Wing scrape during a rejected landing	A04A0057
2004.06.07	Taltson River (Ferguson's Cabin), N.W.T.	Cessna A185F (seaplane)	Upset on water landing	A04W0114
2004.06.11	Bob Quinn Airstrip, B.C.	MD Helicopters (Hughes) 369D (helicopter)	Engine power loss	A04P0206
2004.06.14	Ottawa River, Gatineau, Que.	de Havilland DHC-2 Mk 1 Beaver (seaplane)	Collision with water	A04H0002
2004.06.25	Flourmill Volcano, B.C., 5 nm W	Eurocopter AS350 B2 (helicopter)	Blade strike and rollover	A04P0240
2004.07.14	Ottawa/Macdonald- Cartier International Airport, Ont.	Embraer EMB-145LR	Runway overrun	A04O0188
2004.08.05	Québec/Jean-Lesage International Airport, Que., 12 nm SW	Cessna 208 Caravan Cessna 172	Risk of collision	A04Q0124
2004.08.13	McIvor Lake, B.C.	Robinson R22 Beta (helicopter)	Collision with water	A04P0314
2004.08.26	Ashern, Man., 15 nm SW	Piper PA-28-235	Flight into adverse weather - collision with terrain	A04C0162

DATE	LOCATION	AIRCRAFT TYPE	EVENT	REPORT NO.
2004.08.31	Nain, N.L., 45 nm NW	Aerospatiale AS350D	Loss of control - collision with terrain	A04A0111
2004.09.02	Kingston, Ont.	de Havilland DHC-8-102	Flight control difficulties	A04O0237
2004.09.10	Edmonton, Alta.	Beech King Air C90A	Navigation deviation	A04W0200
2004.09.21	La Ronge, Sask.	Fairchild SA-227-AC Metro III	Landing gear collapse and runway excursion	A04C0174
2004.10.30	Shepherd Bay, Nun.	Bell 212 (helicopter)	Collision with terrain	A04C0190
2004.12.05	St. John's, N.L., 10 nm SW	Piper PA-28-140	Collision with terrain	A04A0148
2004.12.16	Oshawa Municipal Airport, Ont.	Short Brothers SD3-60	Rejected landing - collision with terrain	A04O0336
2004.12.24	Kuuujuaq, Que.	Beech King Air A100	Runway excursion	A04Q0199
2004.12.28	Fairmont Hot Springs, B.C., 15 nm SW	Robinson R44 Raven II (helicopter)	Drive-belt failure and collision with terrain	A04P0422
2005.01.02	Santiago, Chile, 180 nm N	Boeing 767-375	Engine failure - fuel starvation	A05F0001
2005.01.19	Kelowna, B.C., 80 nm NE	Beechcraft King Air 200	Control difficulty due to airframe icing	A05P0018
2005.01.20	Calgary International Airport, Alta.	McDonnell Douglas DC-9-83	Failure to remain on the runway (rejected landing)	A05W0010
2005.02.11	Spearhead Glacier, B.C.	Bell 212 (helicopter)	Settling with power - rollover	A05P0032
2005.02.24	Blue River, B.C.	Bell 212 (helicopter)	Dual engine power loss and hard landing	A05P0038
2005.04.12	Vicinity of High Lake, Nun.	Lockheed L382G Hercules	Component failure - wing-to-fuselage attach angle	A05W0059
2005.04.22	Comox, B.C.	Piper PA-31-350	In-flight fire	A05P0080
2005.05.07	Bella Bella, B.C.	Messerschmitt- Bolkow-Blohm BO 105 (helicopter)	Tail-rotor strike (external load) - loss of control	A05P0103



DATE	LOCATION	AIRCRAFT TYPE	EVENT	REPORT NO.
2005.05.27	St. John's, N.L.	de Havilland DHC-8-100	Stall and loss of control during climb	A05A0059
2005.06.24	Courtenay, B.C., 10 nm N	Robinson R22 Beta (helicopter)	Power loss	A05P0154
2005.06.24	Yellowknife, N.W.T.	de Havilland DHC-3T (Otter) (seaplane)	Incorrect loading/ centre of gravity	A05W0127
2005.07.06	Andrew, Alta., 9 nm W	Piper PA-18	Collision with terrain	A05W0137
2005.07.10	Moose Jaw, Sask.	Waco UPF-7 Wolf-Samson	In-flight collision	A05C0123
2005.07.28	Shovelnose Creek, B.C.	Raytheon Beechcraft King Air 200	Collision with terrain	A05P0189
2005.08.09	Sundre, Alta., 8 nm SE	Lancair IV-P	Loss of control	A05W0160
2005.09.10	Loretto, Ont.	Pezetel SZD-50-3 Puchacz (glider)	Aircraft loss of control - collision with terrain	A05O0204
2005.10.26	Devils Lake, B.C.	Bell 206B (helicopter)	Helicopter rollover - glassy water	A05P0262

AIR RECOMMENDATIONS ISSUED IN 2005-2006

Winnipeg, Manitoba – 6 October 2005

Occurrence No. A05C0187

Cessna 208 Operation into Icing Conditions – Morningstar Air Express Inc.

RECOMMENDATION	RESPONSE	BOARD ASSESSMENT OF RESPONSE	SAFETY ACTION TAKEN
A06-01 The Department of Transport take action to restrict the dispatch of Canadian Cessna 208, 208A, and 208B aircraft into forecast icing meteorological conditions exceeding “light,” and prohibit the continued operation in these conditions, until the airworthiness of the aircraft to operate in such conditions is demonstrated.	Awaiting response	Pending	To be reported next fiscal year
A06-02 The Department of Transport require that Canadian Cessna 208 operators maintain a minimum operating airspeed of 120 knots during icing conditions and exit icing conditions as soon as performance degradations prevent the aircraft from maintaining 120 knots.	Awaiting response	Pending	To be reported next fiscal year
A06-03 The Federal Aviation Administration take action to revise the certification of Cessna 208, 208A, and 208B aircraft to prohibit flight into forecast or in actual icing meteorological conditions exceeding “light,” until the airworthiness of the aircraft to operate in such conditions is demonstrated.	Awaiting response	Pending	To be reported next fiscal year



Winnipeg, Manitoba – 6 October 2005 (continued)

Occurrence No. A05C0187

Cessna 208 Operation into Icing Conditions – Morningstar Air Express Inc.

RECOMMENDATION	RESPONSE	BOARD ASSESSMENT OF RESPONSE	SAFETY ACTION TAKEN
A06-04 The Federal Aviation Administration require that Cessna 208 operators maintain a minimum operating airspeed of 120 knots during icing conditions and exit icing conditions as soon as performance degradations prevent the aircraft from maintaining 120 knots.	Awaiting response	Pending	To be reported next fiscal year

Varadero, Cuba – 6 March 2005

Occurrence No. A05F0047

Rudder Separation in Flight – Air Transat Airbus 310-308

RECOMMENDATION	RESPONSE	BOARD ASSESSMENT OF RESPONSE	SAFETY ACTION TAKEN
A06-05 The Department of Transport, in coordination with other involved regulatory authorities and industry, urgently develop and implement an inspection program that will allow early and consistent detection of damage to the rudder assembly of aircraft equipped with part number A55471500 series rudders.	Awaiting response	Pending	To be reported next fiscal year
A06-06 The European Aviation Safety Agency, in coordination with other involved regulatory authorities and industry, urgently develop and implement an inspection program that will allow early and consistent detection of damage to the rudder assembly of aircraft equipped with part number A55471500 series rudders.	Awaiting response	Pending	To be reported next fiscal year



ASSESSMENT OF RESPONSES TO AIR RECOMMENDATIONS ISSUED IN 2004–2005

Timmins, Ontario, 40 nm W – 20 October 2002

Report No. A02P0261

Engine Power Loss in Flight – Cathay Pacific Airways Airbus A340-300

RECOMMENDATION	RESPONSE	BOARD ASSESSMENT OF RESPONSE	SAFETY ACTION TAKEN
<p>A04-03 The Direction Générale de l'Aviation Civile and the Federal Aviation Administration issue airworthiness directives to require the implementation of all CFM56-5 series jet engine service bulletins whose purpose is to incorporate software updates designed to ensure that, in the event of a permanent magnet alternator failure, the electronic control unit will revert to aircraft power.</p>	<p>On 29 August 2005, the TSB received a letter dated 25 May 2005 in which the Federal Aviation Administration (FAA) responded to recommendation A04-03. The response stated that the C.3.J version software has been incorporated by over 90 per cent of the affected worldwide operators; the remaining CFM56-5C operators are complying voluntarily. The software has been provided to all operators. All other engine models with the same alternator design have similar software logic in place.</p> <p>The FAA also reported that there has not been an alternator failure due to the identified cause (bearing failure) in over 20 months. In total, there have been 29 alternator failures due to this cause. CFM International is currently pursuing root cause and corrective action for this failure, and intends to report its progress to the FAA.</p> <p>The FAA determined that an Airworthiness Directive is not necessary due to the absence of an unsafe condition.</p>	<p>Satisfactory in Part</p>	<p>The C.3.J version software has been incorporated by over 90 per cent of the affected worldwide operators; the remaining CFM56-5C operators are complying voluntarily.</p> <p>CFM International is currently pursuing root cause and corrective action for this failure.</p>



RECOMMENDATION	RESPONSE	BOARD ASSESSMENT OF RESPONSE	SAFETY ACTION TAKEN
<p>A04-04 The Department of Transport ensure the continued airworthiness of Canadian-registered aircraft fitted with the CFM56-5 series engine by developing an appropriate safety assurance strategy to make certain that, in the event of a permanent magnet alternator failure, the electronic control unit will revert to aircraft power.</p>	<p>On 11 March 2005, Transport Canada (TC) responded to recommendation A04-04. TC stated that it confirmed, through communication with the Canadian aviation industry, "that all Canadian aircraft presently affected by CFM Service Bulletin 73-0126 will have their ECU [electronic control unit] software upgraded to version C.3.J by March 2005." The response indicated that TC was not planning to take any further action.</p> <p>On 7 October 2005, a second response was received. This response amplified TC's course of action, which includes the monitoring of Canadian operators until all the applicable CFM56-5 series service bulletins have been incorporated, and the publication, on 3 August 2005, of a Service Difficulty Alert to both Canadian operators and foreign civil aviation authorities to highlight the applicable service bulletins.</p>	<p>Fully Satisfactory</p>	<p>TC is committed to the monitoring of Canadian operators until all the applicable CFM56-5 series service bulletins have been incorporated; and published, on 3 August 2005, a Service Difficulty Alert sent to both Canadian operators and foreign civil aviation authorities to highlight the applicable service bulletins.</p>

In June 2005, the Air Branch reassessment package approved by the Board in May 2005 was provided to Transport Canada, Director General, Civil Aviation. The 2005 annual review of assessments of responses to TSB air recommendations was conducted on 57 "active" recommendations. Consequently, the Board approved the review, which assigned 22 recommendations to "inactive" status. In summary, following the Board's 2005 reassessment, there were 32 "active" recommendations. In addition to these 32, this year's reassessment includes 3 "active" recommendations from 2004, for a total of 35 due for reassessment.

OTHER AIR SAFETY ACTION TAKEN

Following an internal investigation into the occurrence involving control difficulties due to airframe icing, Northern Thunderbird Air Inc., as an interim safety action, distributed a memorandum to advise flight crews to review *all* available weather data before flights. The company has since developed a syllabus, examination and emergency checklist regarding severe icing and has implemented them as part of its training program to provide flight crews with more in-depth knowledge of severe icing conditions and exit strategies.

As a result of a tail-rotor strike by an external load and subsequent loss of control by a Transport Canada (TC) helicopter, the TC Aircraft Services Directorate issued a safety notice restricting operations with empty or light external sling loads. On 25 May 2005, the TC Aircraft Services Directorate produced draft standard operating procedures (SOPs) for helicopter external load operations. These SOPs restrict the use of bonnets and caution pilots about light and unstable loads.

Following an in-flight engine failure on a WestJet Airlines Boeing 737-200 aircraft, TC issued Service Difficulty Advisory 2004-05. This advisory strongly advises maintainers, operators and other responsible persons that compressor surging should be given the same attention as compressor stalls. Surges should be considered to be minor stalls, and the damage that can occur should not be underestimated. The advisory also stated that compressor surges and stalls can induce latent fatigue fractures culminating in engine failures.

As a result of a risk of collision occurrence, NAV CANADA initiated an airspace study entitled *Airspace Review of the Vancouver, Lower Mainland and Victoria Areas* on 26 November 2003. The purpose of the study was to determine the optimum airspace configuration, routes and procedures required for the area. Both operators involved in the occurrence are active participants in this study. Both operators and NAV CANADA are involved in frequent dialogue regarding traffic conflicts and the safety of their operations. Both operators believe that the number of conflicts has been reduced as a result.

As a result of an occurrence involving an elevator restriction at take-off, Bombardier issued a revised procedure for control checks following application of de-icing or anti-icing fluids. The operator took steps to ensure that, when two trucks are used to de-ice an aircraft, they operate symmetrically. The operator also incorporated lessons from this occurrence into flight crew briefings on winter operations and specifically highlighted the manufacturer's recommendation

as to flight control checks. The operator amended the SOPs for the Dash 8 to include a new requirement for a control check to be performed after application of de-icing and anti-icing fluids.

Following an occurrence involving aircraft pitch-up/stall warning on departure, Air Canada implemented several initiatives aimed at enhancing flight crew safety awareness.

- Manuals were updated to reflect new information on speed protection annunciation and information received from Boeing that addresses autopilot operations in a degraded mode of operation.
- The *Flight Crew Training Manual* was updated with a description of the incident, along with a reminder that, when the aircraft is on autopilot and operating in a degraded mode, speed protection will not be available and crew intervention will be required.
- The 2004 Winter Instrument Procedures Flight had, as part of the pre-briefing, a PowerPoint presentation and instructor/candidate interactive dialogue that included what happened during this event.
- Flight crews now view a pictorial display of flight deck indications that demonstrate when crew intervention would be required.
- Flight technical personnel, in conjunction with Air Canada Tech Ops, are determining if all aircraft need to be configured to flight control computer Customer Option 6 or one of the other available options.
- An Aircraft Technical Bulletin has been created to make crews aware of speed protection annunciation and autopilot flight director system failures. This bulletin will remain active until all the relevant information is made available in the aircraft operating manual.
- Boeing 767 SOPs, Initial Climb, have been amended to include an automatic flight speed protection warning: "WARNING - The auto flight system design lacks airspeed protection in ALT CAP mode. Excessive rate of climb when transitioning to ALT CAP mode can create an insufficient energy condition resulting in rapid airspeed decay."

As a result of a risk of collision occurrence, NAV CANADA developed and implemented procedures detailing helicopter operations at the London International Airport, Ontario. Local helicopter operators were briefed on the procedures. As well, NAV CANADA staffed the position of Unit Operations Specialist at the London control tower.

As a result of a wing scrape occurrence during the performance of a rejected approach in poor weather, TC is proposing changes to the *Canadian Aviation Regulations* that will define the use of pilot-monitored approaches as part of the new approach-ban regulations. In response to this occurrence, TC regional staff conducted an inspection of the weather observation service at Moncton, New Brunswick, on 5 October 2005. As a result of the findings, the floodlights near

the ceiling projector were adjusted to reduce interference with weather observations, and NAV CANADA implemented new procedures to improve the communication of information related to changing weather conditions between the weather office and the tower personnel.

Following a fatal floatplane upset occurrence, TC published an article in Issue 1/2005 of the *Aviation Safety Letter*, and plans to prepare new or revised safety promotional material to address the topic of underwater egress. It also intends to develop an emergency procedures training program for its inspectors and to review information on seaplane operations to determine the best method to reach private operators with information on conducting thorough pre-flight briefings, including underwater egress and situational awareness.

TC published an article in Issue 2/2005 of the *Aviation Safety Letter* that summarized an occurrence in which a pilot had advised a friend of his proposed flight itinerary, but the friend was unaware of his responsibilities concerning search and rescue notification requirements. The *Aviation Safety Letter* is sent to all Canadian licensed pilots. The article emphasized the need for pilots to ensure that persons responsible for the flight itinerary fully understand the search and rescue notification requirements.

Following an occurrence in which a landing gear collapsed as a result of the installation of an incorrect part during maintenance and failure to properly check the installation, Northern Dene Airways Ltd. commissioned an independent safety audit of its complete operation. All maintenance staff of the authorized organization responsible for maintaining Northern Dene Airways Ltd.'s aircraft met to review the company's maintenance procedures outlined in its Maintenance Policy Manual. The following policy was reinforced: "No one is to install any parts on any aircraft without first referring to the appropriate parts and service manuals to ensure correct part number and also that the integrity of the affected aircraft system is still in place."

A Canadian Helicopters Limited helicopter departed into environmental conditions conducive to whiteout and collided with terrain with one fatality. Following the occurrence, the company, as part of its safety management system, completed an internal investigation to draw lessons from the accident. Canadian Helicopters Limited increased its use of full-motion flight simulator training to help replicate departures under whiteout conditions and to monitor flight crew interaction. Following a review of its existing SOPs, simulator training will also emphasize compliance. The company instituted a policy requiring a minimum of 50 hours on type before pilots perform departures under whiteout conditions. It is assessing the use of low-profile reflective markers at Northern Warning System helipads to provide additional visual cues along departure and approach paths.

As a result of a component failure on a Lockheed L382 Hercules, Lockheed Martin issued Revision 3 of Service Bulletin 382-53-61/82-752, dated 4 August 2005. Revision 3 of the Service Bulletin specifically identified the need for a visual inspection of the wing-to-fuselage attach angles on applicable aircraft, to be accomplished within 30 days after receipt of the Service Bulletin to determine if repairs have been installed, and further recommended replacement of any previously repaired attach angle within 365 days.

Following an engine fire and crash of a Piper PA-31-350, TC confirmed, after consultation with the U.S. Federal Aviation Administration, that the intent of Airworthiness Directive (AD) 2002-12-07 was to include “ALL rebuild or overhauled engines.” Effectively, the intent was to broaden the “Applicability” section of the AD to ensure that all affected (old-style) gaskets identified by part number LW 13388 be removed from service, purged from the system, and replaced with new gaskets identified by part number 06B23072, in accordance with Part II or Part III of Textron Lycoming Supplement 1 to Mandatory Service Bulletin (MSB) 543A. TC sent a Service Difficulty Alert (AL-2005-08), dated 17 October 2005, to all owners, operators and overhaul facilities to ensure that owners/operators and overhaul facilities of engines affected by AD 2002-12-07 had complied with all the requirements stated within the AD, incorporated Lycoming MSB 543 latest issue, and ensured that inventories of spare parts had been purged of any converter plate gaskets identified by part number LW.



APPENDIX A - GLOSSARY

Accident	in general, a transportation occurrence that involves serious personal injury or death, or significant damage to property, in particular to the extent that safe operations are affected (for a more precise definition, see the <i>Transportation Safety Board Regulations</i>)
Incident	in general, a transportation occurrence whose consequences are less serious than those of an accident, or that could potentially have resulted in an accident (for a more precise definition, see the <i>Transportation of Safety Board Regulations</i>)
Occurrence	a transportation accident or incident
Recommendation	a formal way to draw attention to systemic safety issues, normally warranting ministerial attention
Safety Advisory	a less formal means for communicating lesser safety deficiencies to officials within and outside the government
Safety Information Letter	a letter that communicates safety-related information, often concerning local safety hazards, to government and corporate officials