Transportation Safety Board of Canada

Bureau de la sécurité des transports du Canada

TSB

TRANSPORTATION SAFETY BOARD

Annual Report to Parliament

2003-2004

Canada

Transportation Safety Board of Canada
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Gatineau, Quebec K1A 1K8
5 October 2004

The Honourable Lucienne Robillard
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 2003 to 31 March 2004.

Yours sincerely,

Charles H. Simpson
Acting Chairperson

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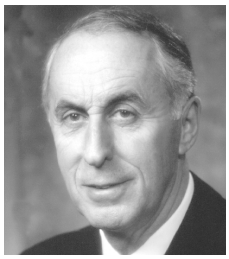
MEMBERS OF THE BOARD

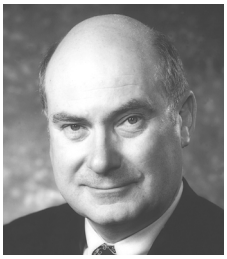


Acting Chairperson Charles H. Simpson *(from 9 February 2004)*

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.

Chairperson Camille H. Thériault *(until 8 February 2004)*

Public management experience includes Premier of New Brunswick, provincial Minister of Economic Development and Tourism, and responsibility for the Information Highway Secretariat. Private enterprise experience includes General Manager of the Kent Industrial Commission and Vice-President of the United Maritime Fishermen.

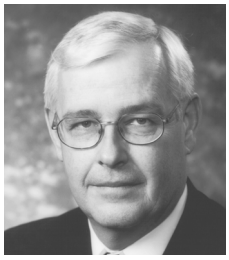


Member Jonathan Seymour

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 Wendy A. Tadros

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.



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.

CHAIRPERSON'S MESSAGE

Canada is a trading nation, and our place in the world is determined in large part by our ability to efficiently transport people, goods and services from coast to coast to coast and beyond our borders. Indicators of our nation's safety culture (for example, the number of reported accidents and related fatalities) show progress in the area of safety across all transportation modes and confirm that the Transportation Safety Board of Canada's (TSB) efforts toward efficiency and improvement are paying off.

In 2003-2004, its efforts were not only successful but also rewarded when, on December 1, 2003, the TSB team that investigated the September 2, 1998 crash of Swissair Flight 111 received the Head of the Public Service Award for Excellence in Service Delivery for its outstanding work.

When the team began its investigation, millions of pieces of wreckage from the aircraft were strewn across the ocean floor approximately 55 metres underwater and there were no recorded voice or technical data to help them reconstruct the final six minutes of the flight. This absence of crucial information forced the team to develop innovative methods to determine what happened.

Working closely with Canadian and foreign government departments and agencies, as well as local authorities, the airline industry, companies and individuals, the members of the team meticulously pieced together the puzzle. The Clerk of the Privy Council and Secretary to the Cabinet considered that their performance was worthy of the Head of the Public Service Award for Excellence in Service Delivery. This award is presented annually to recognize employees who best exemplify the work of public service employees in meeting the challenges outlined in the Clerk of the Privy Council's *Annual Report to the Prime Minister on the Public Service of Canada.*

The members of the Swissair Flight 111 investigation team demonstrated not only great resourcefulness and professionalism in carrying out their work, but also compassion for the families of the crew and passengers who died. Their dedication and expertise exemplify the best qualities of public service.

It is a momentum of excellence we must continue. Our collective efforts are vital to achieve national prosperity in the new millennium.

In keeping with these efforts, the TSB embarked upon several new initiatives this past year to enhance its overall contributions to domestic and global safety.

For example, the TSB began efforts to improve its response to stakeholder needs. The results of extensive TSB research showed that stakeholders expect the organization to take on a more formal and active role in the safety mosaic, including vigorous and continuous communications.

To this end, the TSB initiated a public awareness program designed to foster dialogue and share information with the industry, operators and regulators. It is our firm belief this program will forge more meaningful relations and, in turn, strengthen our mutual objective to advance safety.

Another TSB priority was to reduce the overall number of open investigations so that our recommendations remain timely and relevant upon their publication in TSB final reports. In 2003-2004, the Treasury Board allocated short-term funding to the TSB to reduce, by the end of 2004-2005, its backlog of investigations in process from 158 to 100 and improve the average time to complete investigations.

During the reporting period, significant progress was made to provide clarity and stability to the way we operate. The adoption of a new business and resources planning framework has enabled the TSB to carry out its mandate more effectively. Throughout the organization, we will continue to refine our business processes in an effort to enhance our relevance and contribution to transportation safety in Canada and around the world.

As in previous years, TSB's practices and methodologies have been sought out by other countries and we have freely shared information and investigative skills with them. Our presence on the international scene contributes to the advancement of transportation safety worldwide and allows our staff to stay abreast of rapid technological changes.

The goal of improving transportation safety is one that provides us with constant challenge. It is important that we take time to review our work, note the strides that we take towards our goal and to celebrate those important milestones. We must rededicate ourselves to this important endeavour and strive to ensure that Canadians can rely on a safe transportation system.

Charles H. Simpson
Acting Chairperson

SENIOR MANAGEMENT

Executive Director	D. Kinsman
General Counsel	A. Harding
Director General, Investigation Operations	T. Burtch
Director General, Information Strategies and Analysis	G. Hunter
Director, Corporate Services	J. L. Laporte
Director, Marine Investigations	F. Perkins
Director, Rail/Pipeline Investigations	I. Naish
Director, Air Investigations	N. Stoss
Director, Engineering	J. Foot / D. Rocheleau

MISSION OF THE TSB

The *Canadian Transportation Accident Investigation and Safety Board Act* is the legal framework governing the TSB's activities.

The mission of the TSB is to advance transportation safety by:

- conducting independent investigations, including public inquiries, into selected transportation occurrences to make findings as to their causes and their contributing factors;
- identifying safety deficiencies;
- making recommendations designed to eliminate or reduce safety deficiencies; and
- reporting publicly on its investigations and findings.

It is not the function of the Board to assign fault or to determine civil or criminal liability.

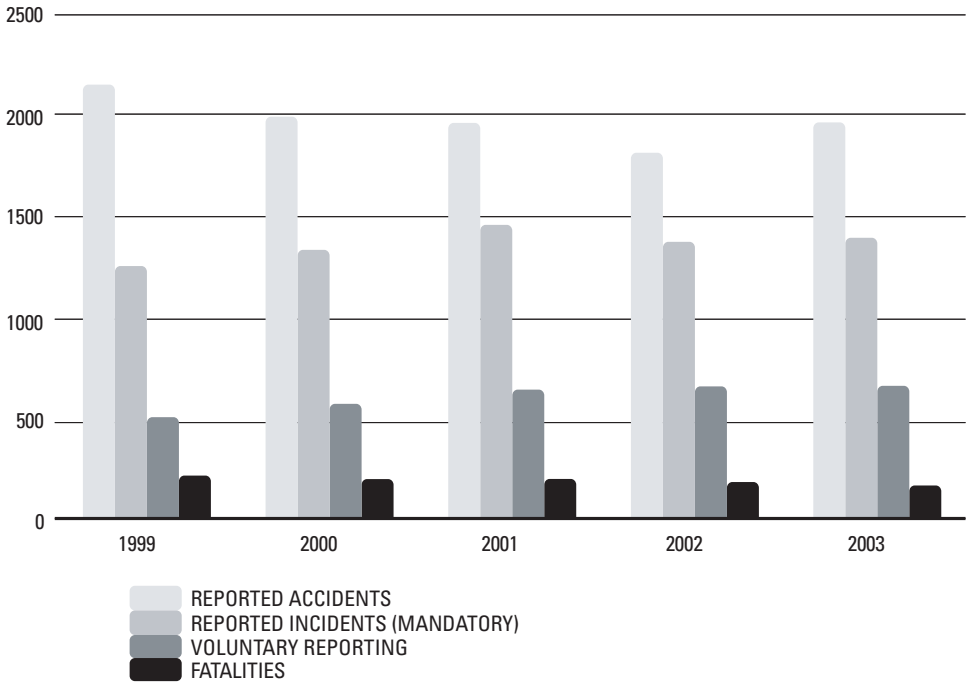
INDEPENDENCE

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. Its 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, and integrity and the fairness of its processes.

OCCURRENCES, INVESTIGATIONS AND SAFETY ACTION

In 2003, a total of 1968 accidents and 1388 incidents were reported in accordance with the TSB's regulations for mandatory reporting of occurrences.[1] The number of accidents in 2003 increased by 9% from the 1812 accidents reported in 2002, but decreased by 2% from the 1998-2002 annual average of 1999 accidents. There were also 670 voluntary incident reports. Fatalities totalled 172 in 2003, down from 188 in 2002 and the 1998-2002 average of 263.

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. Investigations were undertaken for 72[2] of the approximately 4000 occurrences reported to the TSB in fiscal year 2003-2004. In that same period, 73 investigations were completed,[3] compared to 109 in the previous year. The number of investigations in process decreased to 137, at the end of the fiscal year, from 139 at the start. Average time to complete an investigation increased to 684 days in fiscal year 2003-2004, from 580 days

1. While the Board's operations are for the 2003-2004 fiscal year, occurrence statistics are for the 2003 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. In a live database, the occurrence data are constantly being updated. Although an occurrence may happen during a given fiscal year, the decision to undertake an investigation may be taken later as a result of a more thorough analysis of preliminary data.
3. Investigations are considered complete after the final report has been issued.

in the previous year. Several complex multi-year investigations were finalized during the reporting period, which increased the average completion time. We anticipate that the average time will be significantly lower in the coming years. Information on all reported occurrences was entered in the TSB database for historical record, trend analysis, and safety deficiency validation purposes.

FIGURE 2 – INVESTIGATIONS IN PROCESS / COMPLETED

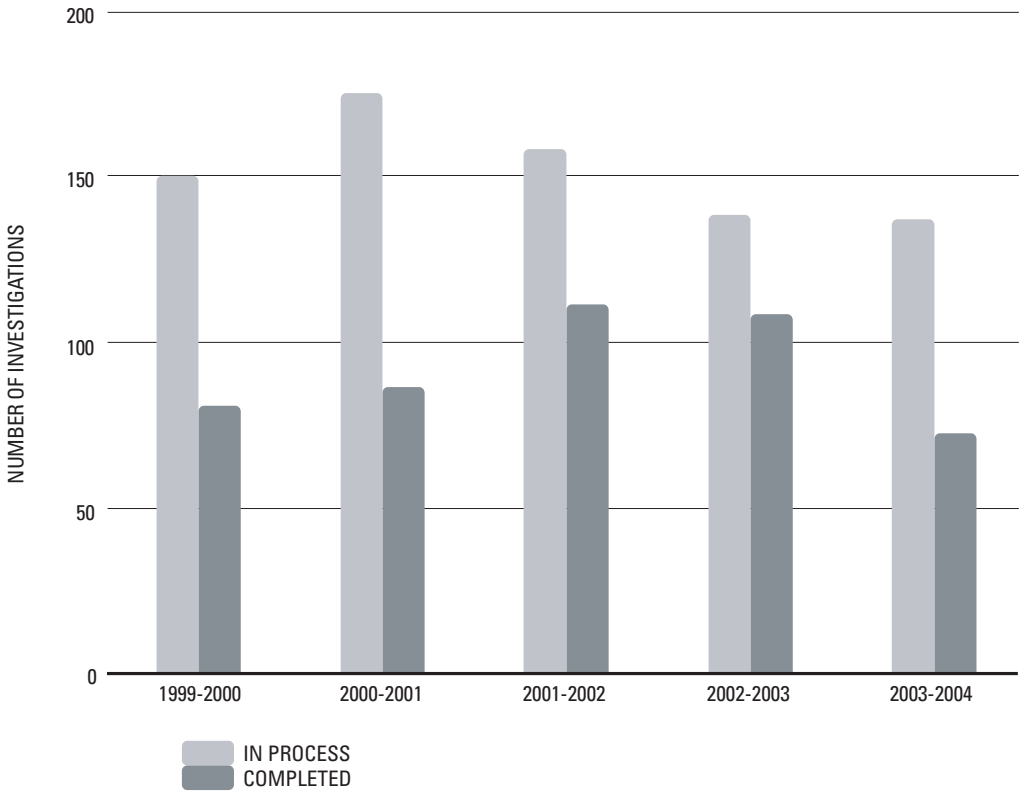


FIGURE 3 – SAFETY ACTION BY THE TSB

2003–2004	RECOMMENDATIONS[4]	SAFETY ADVISORIES	SAFETY INFORMATION LETTERS
Marine	7	6	11
Pipeline	0	0	0
Rail	4	7	11
Air	0	9	8
TOTAL	11	22	30

Note: A total of six Safety Concerns were issued for Marine in 2003-2004.
A total of two Safety Concerns were issued for Rail in 2003-2004.

In accordance with the *Canadian Transportation Accident Investigation and Safety Board Act*, a federal minister who is notified of Board recommendations must, within 90 days, advise the Board in writing of any action taken or proposed to be taken in response or reasons for not taking action. The Board considers each response, assessing the extent to which the related safety deficiency was addressed.

FIGURE 4 – BOARD ASSESSMENT OF RESPONSES TO RECOMMENDATIONS[5]

2003–2004	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	2	0	2	1
Pipeline	0	0	0	0
Rail	0	0	2	1
Air	0	8	0	3
TOTAL	2	8	4	5

4. For definitions of terms such as *recommendation, safety advisory* and *safety information letter*, **see Appendix A.**
5. Also includes responses to recommendations issued in the previous fiscal year.

LIAISON WITH CANADIAN TRANSPORTATION COMMUNITY

As part of the TSB's effort 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.

Through the Industry Visits Program, members of the Board travelled to Pratt & Whitney and the Canadian National (CN) Taschereau Yard in Montréal; the Port Authority, NAV CANADA, container shipping companies, BC Ferries and the Delta Container Port in Vancouver; and the Harbour Authority, Transport Canada Regional and Coast Guard in Victoria. In the same period, briefings were presented to the Board by the Aerospace Industries Association of Canada (AIAC), the Railway Association of Canada (RAC) and Transport Canada. Members of the Board also made presentations to the Empire Club of Canada, the Canadian Railway Club, and the International Aircraft Cabin Safety Symposium of Canada.

In addition, the Executive Director attended numerous safety and association meetings, including the Canadian Business Aircraft Association's Annual Stakeholders Meeting; the Air Transport Association of Canada's Annual General Meeting; the Canadian Owners and Pilots Association Annual General Meeting; the Canadian Aviation Executives' Safety Network Annual Meeting; and the Transport Canada-sponsored Canadian Aviation Safety Seminar.

Marine staff participated in meetings with the Society of Naval Architects and Marine Engineers, the Canadian Maritime Law Association, the Canadian Marine Pilots Association and the Canadian Marine Advisory Council (at the regional and national level), and made presentations to several organizations. They are also closely involved in the recently formed Inter-Agency Marine Action Group in Vancouver, which promotes marine safety, particularly in the fishing industry.

Pipeline staff made presentations about TSB's mandate and investigative process to the pipeline industry, including TransCanada PipeLines Limited, Enbridge Inc. and Duke Energy, and the National Energy Board, the pipeline safety regulator.

Rail staff made presentations to the rail industry, international rail industry experts, Transport Canada, the Railway Association of Canada, the Rotary Club and the Canadian Fertilizer Institute.

Air staff provided formal briefings on the TSB's mandate, organization and operations to Transport Canada, the Canadian Business Aircraft Association, the Air Line Pilots Association, the Air Canada Pilots Association, the Air Transportation Association of Canada, and to a number of other associations, clubs and organizations. In addition, they worked with the Department of National Defence (DND) to establish a Working Arrangement between the TSB Air Investigations Branch and the DND Directorate of Flight Safety.

Members of the Swissair 111 investigation team provided briefings on the Swissair investigation, as well as other investigation-related topics, to the Conference Board of Canada, the North American Aerospace Congress and Exhibitions (Flight Safety Foundation), the Canadian Association of Fire Investigators, the Air Canada Pilots Association investigators refresher training, the Canadian Association of Fire Chiefs, Transport Canada's Engineering and Flight Test Delegates Conference, an Air Canada engineering managers briefing, a DND Advanced Flight Safety Course, and the Work-place Safety and Health Conference. Team members also participated in the production and airing of two documentaries on the TSB's Swissair 111 investigation.

The TSB's Engineering facilities continued to be of particular interest to industry groups through briefings and visits, resulting in an enhanced awareness and understanding of how scientific methods and technology are used during TSB investigations.

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: participation in safety symposiums, international safety organizations and international investigations.

Over the past year, Board members visited the U.S. National Transportation Safety Board to observe their recommendations follow-up process and the public tabling of an accident report and attended the Air Line Pilots Association Annual General Meeting. The Board was also visited by the Chairman of the Australian Transport Safety Bureau.

The Executive Director attended the Chairman's visit to the U.S. National Transportation Safety Board, met with International Transportation Safety Association executives, and attended the Air Line Pilots Association Annual General Meeting and the Flight Safety Foundation Annual Safety Conference.

Marine staff attended international transportation meetings, including International Maritime Organization (IMO) meetings in London, the Marine Accident Investigators' International Forum in Chile, the International Fishing Industry Safety and Health Conference in Alaska and a Society of Naval Architects and Marine Engineers meeting in San Francisco. They provided a TSB representative to an accident investigation conducted by the IMO on behalf of the government of Senegal and assisted with the presentation of a marine accident investigation course, sponsored by IMO and held in Trieste, Italy.

Air staff participated in foreign investigations in support of the Portuguese authorities in the Air Transat accident investigation, the United Kingdom's Air Accidents Investigation Branch, France's Bureau d'Enquêtes et d'Analyses pour la sécurité de l'aviation civile (formerly Bureau Enquêtes-Accidents) and the National Transportation Safety Board of the United States. Formal briefings were provided to Cubana Airlines personnel, the

United States Federal Aviation Administration Transport Safety Directorate, the General Aviation Manufacturers Association and the International Aircraft Wiring Issues Conference.

Air staff also participated in consultations and conferences on international standards, bilateral agreements and protocols with the investigation authorities of France, Iceland, Norway, Sweden, Finland, Denmark, Portugal, Italy, Czech Republic, South Africa, China and the United States. Further, participants attended the International Society of Air Safety Investigators Conference, the Flight Safety Foundation Conference, the Human Factors in Aviation Seminar organized by the Australian Aviation Psychology Association and lectured at the Singapore Aviation Academy Aircraft Accident Investigation Course.

TSB's Flight Data Recorder Analysis software has now become widely recognized as a leading Canadian technology. In 2003, users included major aircraft manufacturers and airlines, as well as accident investigation authorities in 11 other countries worldwide. This has led to improved information exchange and international cooperation of benefit to all users and will assist in future TSB investigation efforts.

Also of note, a 90-minute documentary by CBC on the Swissair 111 accident investigation was aired in several European countries in the French and German languages.

Rail staff had formal and informal discussions with regulatory, industry and investigative bodies at two separate international conferences with counterparts from Australasia, China, India, the Middle East, Western and Eastern Europe, and North America. A presentation on vandalism was made at one of these conferences. Rail managers met with the Chairman and the Director of New Zealand's Land Transport Safety Authority who were on a fact finding mission to discuss rail-related safety issues in Canada.

Human Performance staff made a presentation on the application of human factor techniques to accident investigation at the 12th International Aviation Psychology Symposium. They also delivered the Human Factors in Investigations course to external participants including international investigative agencies (New Zealand, Holland and Turkey), provincial and federal investigative and regulatory bodies (Workers' Compensation Board of BC, Government of Manitoba, Saskatchewan Government Insurance, DND, Transport Canada and the National Energy Board), and industry (Air Canada, NAV CANADA, PROAV International Aviation Services Corporation, Pakistan International Airlines and Nexen Chemicals).

Macro Analysis staff presented the research report "An Accident-Based Examination of Factors Associated with Train-in-Crossing Collisions" to the 34th Annual Conference of the Association of Canadian Ergonomists. A representative also gave a presentation on applicability of safety investigations to industry as the invited International Luncheon Speaker for the 21st International System Safety Society Annual Conference.

MARINE

Occurrence Statistics and Investigations

ANNUAL STATISTICS

There were 546 marine accidents reported to the TSB in 2003, a 13% increase from the 2002 total of 485 and a 2% increase from the 1998-2002 average of 537. Marine fatalities reached a 29-year low of 18 in 2003, down from 28 in 2002 and the 1998-2002 average of 34.

Shipping accidents, which accounted for 88% of marine accidents, totalled 481 in 2003—up from 449 in 2002, but comparable to the 1998-2002 average of 477. Approximately 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 65 in 2003, up from 36 in 2002 and the 1998-2002 average of 60.

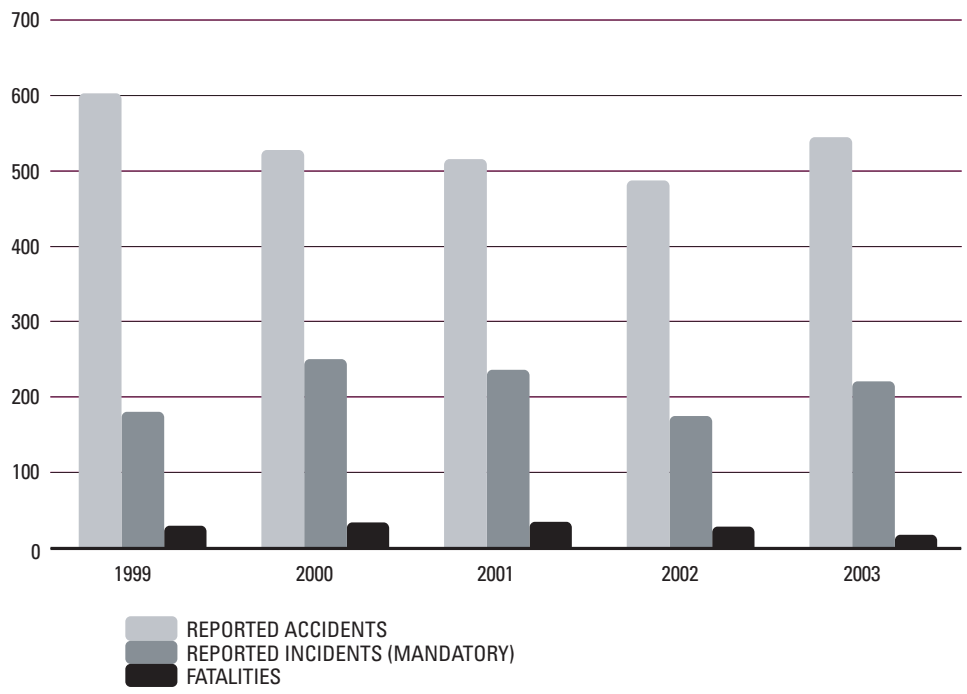
Marine activity for Canadian commercial non-fishing vessels increased by 10% from the 1998-2002 average, resulting in a 16% decrease in the accident rate from 3.2 to 2.7 accidents per 1000 movements. Although marine activity for foreign commercial non-fishing vessels remained relatively unchanged compared to the 1998-2002 average, accidents decreased yielding a 33% reduction in the accident rate from 2.1 to 1.4 accidents per 1000 movements.

In 2003, shipping accidents resulted in 9 fatalities, down from 19 in 2002 and the 1998-2002 average of 21. Accidents aboard ship resulted in 9 fatalities, equal to the 2002 total but lower than the 1998-2002 average of 13.

There were 34 vessels reported lost in 2003, comparable to the 32 reported lost in 2002 but lower than the 1998-2002 average of 43. This decrease is mainly accounted for by a reduction in lost vessels under 15 tons gross tonnage.

In 2003, 221 marine incidents were reported in accordance with TSB mandatory reporting requirements. This represents a 27% increase from the 2002 total of 174 and a 10% increase over the 1998-2002 average of 201. This increase is primarily attributable to an increase in close-quarters situations.

FIGURE 5 – MARINE OCCURRENCES AND FATALITIES



MARINE INVESTIGATIONS STARTED IN 2003-2004

The following information is preliminary. Final determination of events is subject to the TSB's full investigation.

DATE	LOCATION	VESSEL(S)	TYPE	EVENT	OCCURRENCE NO.
2003.04.15	Sault Ste Marie, Ont.	*Emerald Star*	Tanker	Grounding	M03C0016
2003.05.02	Near North Head, St. John's, N.L.	*Sir Wilfred Grenfell* *Genney and Doug*	CCG-search and rescue Fishing	Collision	M03N0047
2003.05.03	Portuguese Cove, N.S.	*Shinei Maru No. 85*	Fishing	Grounding and taking water	M03M0040
2003.05.12	Off Hood Point, Howe Sound, B.C.	*Queen of Surrey*	Passenger-vehicle ferry	Fire in engine room	M03W0073
2003.05.13	5 nm SSW of Port aux Basques, N.L.	*Joseph and Clara Smallwood*	Passenger-vehicle ferry	Fire in cargo space	M03N0050
2003.06.25	3 nm S of Petit-de-Gras, N.S.	*Silent Provider*	Fishing	Fire in engine room	M03M0077
2003.09.29	5 Miles North of Heath Point, Anticosti, Que.	*Evan Richard*	Fishing	Foundering and grounding	M03L0124
2003.11.08	Sand Heads, Fraser River, B.C.	*Cielo Del Canada*	Container	Grounding	M03W0237
2003.12.06	Anchorage Saint-Jean, Île d'Orleans, Que.	*Yong Kang*	Bulk carrier	Grounding	M03L0148
2003.12.22	Mission, Fraser River, B.C.	*Mistral* *Tiger Shaman* *Packmore 4000*	Pleasure craft Tug Barge	Collision	M03W0265
2004.02.26	Queen Charlotte Sound, B.C.	*Hope Bay*	Fishing	Capsizing	M04W0034
2004.03.04	10 nm NNE of Low Point, N.S.	*Caribou*	Passenger-vehicle ferry	Fire in boiler/furnace	M04M0013

MARINE REPORTS RELEASED IN 2003-2004

DATE	LOCATION	VESSEL(S)	TYPE	EVENT	REPORT NO.
1999.09.24	Off Île Rouge, St. Lawrence River, Que.	*Norwegian Sky*	Passenger	Grounding	M99L0098
1999.11.09	Cap Tourmente, Que.	*Alcor* *Eternity* *Canmar Pride*	Bulk carrier Tanker Container	Grounding Subsequent near collision	M99L0126
2000.04.27	Port of Sorel, St. Lawrence River, Que.	*Federal Fuji* *Tecam Sea*	Bulk carrier Bulk carrier	Striking	M00L0039
2000.06.01	Bruce Mines Wharf, Georgian Bay, Ont.	*Algowood*	Bulk carrier	Structural failure	M00C0026
2000.08.14	Stormont, N.S.	*Mersey Venture*	Freezer trawler	Uncontrolled descent of freight elevator	M00M0083
2000.09.14	Colburne Passage, B.C.	*Spirit of Vancouver Island* *Star Ruby*	Passenger-vehicle ferry Pleasure craft	Collision	M00W0220
2000.10.08	North Twillingate, N.L.	*127606*	Open boat CFV	Capsizing	M00N0089
2000.10.26	English Bay, Vancouver, B.C.	*Pacmonarch*	Bulk carrier	Accidental release of lifeboat	M00W0265
2000.10.31	Bridges Passage, N.L.	*Mokami*	Tanker	Grounding	M00N0098
2000.12.18	Pitt River Highway Bridge, B.C.	*Miller Richmond* *Miller 201* *Miller 206*	Tug Barge Barge	Striking of a bridge	M00W0303
2001.03.22	Off Chebucto Head, N.S.	*Kitano*	Container	Container fire	M01M0017
2001.04.01	Near Pier 23, Hamilton Harbour, Ont.	*Hamilton Energy* *Provmar Terminal* *Utviken*	Tanker Tanker Bulk cargo	Striking	M01C0008
2001.04.19	Off Belle Isle, N.L.	*Fame*	Shrimp factory freezer trawler	Flooding and sinking	M01N0020
2001.09.05	Off Pointe-Sapin, N.B.	*Alain-Josée*	Small fishing	Swamping	M01M0100
2001.09.29	Off Havre-Saint-Pierre, Que.	*Alex B.1*	Scallop dragger	Major water ingress	M01L0112
2002.03.19	32 nm North of the Îles-de-la-Madeleine, Que.	*Lake Carling*	Bulk carrier	Hull fracture	M02L0021
2002.04.13	Gabriola Island, B.C.	*Bowen Queen*	Passenger-vehicle ferry	Malfunction of automatic steering control for right angle drives	M02W0061
2002.08.13	Off entrance to Fraser River, B.C.	*Cap Rouge II*	Small fishing	Capsizing and loss of life	M02W0147

MARINE RECOMMENDATIONS ISSUED IN 2003-2004

RECOMMENDATION	RESPONSE	BOARD ASSESSMENT OF RESPONSE
Bruce Mines Wharf, Georgian Bay, Ontario – 1 June 2000 Structural Failure– Bulk Carrier *Algowood*		Occurrence No. M00C0026
M03-01 The Department of Transport require that masters on all Canadian bulk carriers of 150 m in length and over have continuous access to on-board or company shore-based hull stress monitoring systems to help ensure that maximum allowable hull girder stresses are not exceeded.	Response received 20 November 2003.	To be reported next fiscal year.
Off Havre-Saint-Pierre, Quebec – 29 September 2001 Major Water Ingress – Scallop Dragger *Alex B. 1*		M01L0112
M03-02 Transport Canada, in coordination with Fisheries and Oceans Canada, fisher associations and training institutions, develop a national strategy for establishing, maintaining and promoting a safety culture within the fishing industry.	Response received 20 November 2003.	To be reported next fiscal year.
Cap Tourmente, Quebec – 9 November 1999 Grounding and Constructive Total Loss – Bulk Carrier *Alcor*		M99L0126
M03-03 The Department of Transport, the Department of Fisheries and Oceans, and Canadian pilotage authorities, in consultation with marine interests, develop, implement, and exercise contingency plans to ensure that risks associated with navigation-related emergencies are adequately addressed.	Awaiting response.	
Pitt River Highway Bridge, British Columbia – 18 December 2000 Striking of a Bridge – Tugboat *Miller Richmond* and Barges *Miller 201* and *Miller 206*		M00W0303
M03-04 The Fraser River Port Authority and the provincial Ministry of Transportation, in collaboration with the bridge tenders and vessel operators, review and, if necessary amend, their current policies, practices and procedures, and ensure implementation so that the safety of vessels, bridges and bridge traffic is not compromised.	Awaiting response.	

RECOMMENDATION	RESPONSE	BOARD ASSESSMENT OF RESPONSE
Off entrance to Fraser River, British Columbia – 13 August 2002 Capsizing and Loss of Life – Small Fishing Vessel *Cap Rouge II*		Occurrence No. M02W0147
M03-05 The Department of Transport require all new inspected small fishing vessels of closed construction to submit stability data for approval.	Response received 17 February 2004.	To be reported next fiscal year.
M03-06 The Department of Transport require all existing inspected small fishing vessels currently without any approved stability data be subjected to a roll period test and a corresponding freeboard verification not later than their next scheduled quadrennial inspection.	Response received 17 February 2004.	To be reported next fiscal year.
M03-07 The Department of Transport, in collaboration with the fishing community, reduce unsafe practices by means of a code of best practices for small fishing vessels, including loading and stability, and that its adoption be encouraged through effective education and awareness programs.	Response received 17 February 2004.	To be reported next fiscal year.

Note: No safety action has been taken yet for the above-mentioned investigations.

ASSESSMENT OF RESPONSES TO MARINE RECOMMENDATIONS ISSUED IN 2002-2003

RECOMMENDATION	RESPONSE SUMMARY	BOARD ASSESSMENT OF RESPONSE	SAFETY ACTION TAKEN
Bridge 11, Welland Canal and Bulk Carrier *Windoc* Welland Canal, Allanburg, Ontario – 11 August 2001 Striking and Subsequent Fire on Board			Occurrence No. M01C0054
M02-01 The St. Lawrence Seaway Management Corporation (SLSMC) reassess and clearly identify safety-sensitive positions in their organization in which incapacity due to impairment could result in direct and significant risk of injury to the employee, others or the environment.	SLSMC reassessed and clearly identified those positions that are safety-sensitive.	Fully satisfactory	A new SLSMC Drug and Alcohol Abuse Policy addresses safety-sensitive positions.
M02-02 The St. Lawrence Seaway Management Corporation establish programs and policies which are pro-active and promote early detection of impairment and safety risk of employees occupying safety-sensitive positions by management, supervisors or peers and which provide an effective mechanism for remedial action.	A new SLSMC Drug and Alcohol Abuse Policy was being developed in cooperation with the union representing SLSMC employees.	Fully satisfactory	The new Drug and Alcohol Abuse Policy was introduced to all employees and training in its application is being provided to all SLSMC management personnel, union executives and safety representatives. Supervision of employees at isolated sites has been enhanced.
M02-03 The St. Lawrence Seaway Management Corporation conduct, in collaboration with the other appropriate authorities and organizations, exercises to respond to vessel-related emergencies which may be encountered within the Seaway, including the Welland Canal, in order to evaluate the preparedness for responding to a major vessel-related emergency.	SLSMC contingency plans were updated and included an exercise schedule. An internal exercise was being developed and an exercise involving outside agencies was being planned for the fall of 2003.	Satisfactory in part	Two internal table-top exercises were conducted in each SLSMC region, the results of which were integrated in their contingency plan. Annual exercises are to be conducted, and arrangements to conduct an inter-agency exercise are ongoing.
M02-04 The Department of Transport ensure that overall preparedness is appropriate for responding to vessel-related emergencies within the Seaway.	The Board is clarifying the jurisdiction of the Minister of Transport.	Pending	To be reported next fiscal year.
M02-05 The St. Lawrence Seaway Management Corporation ensure that physical and administrative defences are in place to ensure that Seaway bridges are prevented from coming into contact with transiting vessels.	SLSMC is evaluating sensor technology to establish the reliability and effectiveness of tools to detect the presence of vessels under a bridge and prevent it from being lowered if a vessel is present.	Satisfactory in part	Two vessel detectors have been installed at Bridge 11 and are to be integrated into the operation of the bridge for the upcoming navigation season. Similar detectors are to be installed at other Seaway bridges.

OTHER MARINE SAFETY ACTION TAKEN

- TC stated it will review the requirements for a second means of escape from crew spaces on small fishing vessels.
- TC stated it will amend the Marine Emergency Duties A3/A4 courses to include special training on boarding rigid liferafts.
- The Department of Fisheries and Oceans (DFO)/Canadian Coast Guard (CCG) made improvements to the aids to navigation at the approaches to Port Hardy, British Columbia.
- The ferry company Marine Atlantic Inc. amended its safety management manuals and took action to ensure safety briefings are carried out on the ferries.
- Marine Atlantic Inc. stated that it will take action to improve crew familiarity with the ferry fire detection system and improve internal shipboard communications.
- Effective 1 August 2003, when transiting Seaway waters, a duplicate set of the ship's fire control plans is required by the St. Lawrence Seaway Management Corporation to be permanently stored in a prominently marked weathertight enclosure outside the vessel's deckhouse (superstructure) for the assistance of shore side fire-fighting personnel.
- As of 1 October 2003, the St. Lawrence Seaway Management Corporation requires vessels within the Seaway to have qualified personnel in the wheelhouse at all times and to have sufficient and well-rested crew members available for mooring operations.
- In conjunction with the Canadian Association of Fire Chiefs, TC sent a survey to over 150 fire departments across Canada to evaluate the preparedness of Canadian firefighters in responding to shipboard incidents at Canadian ports.
- On 24 February 2004, TC's *Life Saving Equipment Regulations* were amended to require the stowage of life-saving equipment so that it is readily accessible.

PIPELINE

Occurrence Statistics and Investigations

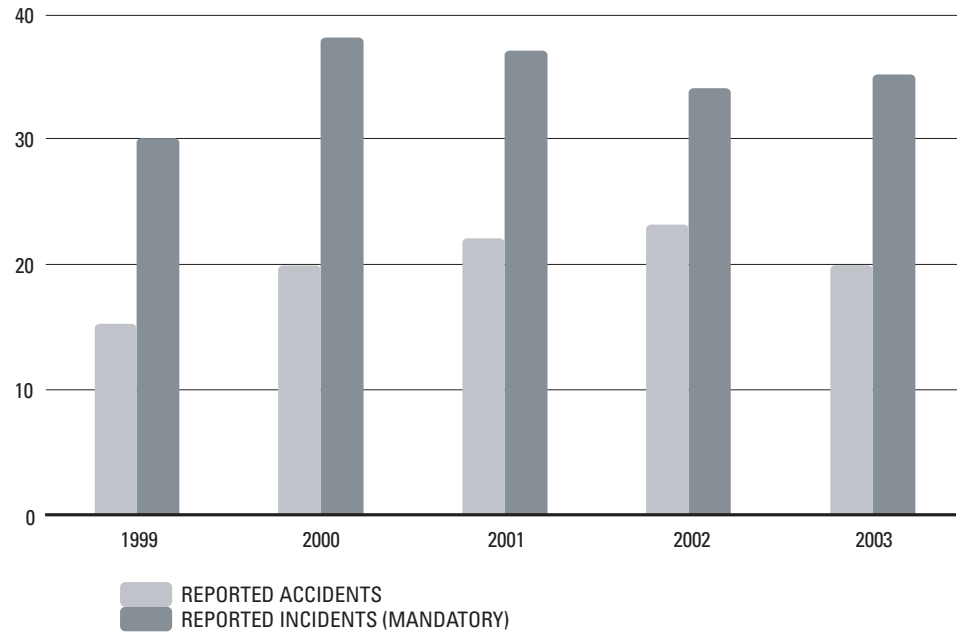
ANNUAL STATISTICS

A total of 20 pipeline accidents were reported to the TSB in 2003, equal to the 2002 total and the 1998-2002 average. The last fatal pipeline accident in the portion of the industry under federal jurisdiction occurred in 1988. No serious injuries resulted from pipeline accidents in 2003. Between 1998 and 2002, five serious injuries occurred, including four from one accident in 1998.

Pipeline activity is estimated to have increased by 5% over last year, yielding an accident rate of 1.5 pipeline accidents per exajoule[6] in 2003, down from 1.58 in 2002 and the 1998-2002 average rate of 1.67.

In 2003, 38 pipeline incidents were reported in accordance with TSB mandatory reporting requirements, up three from the 2002 total and the 1998-2002 average. In 2003, 84% of incidents involved uncontained or uncontrolled release of small quantities of gas, oil and high vapour-pressure products.

FIGURE 6 – PIPELINE OCCURRENCES



6. 10^{18} joules – a joule is a unit of work or energy equal to the work done by a force of one newton acting through a distance of one metre.

RAIL

Occurrence Statistics and Investigations

ANNUAL STATISTICS

A total of 1030 rail accidents were reported to the TSB in 2003, a 5% increase from last year's total of 984 but a 3% decrease from the 1998-2002 average of 1062. As rail activity has been relatively constant over the last six years, averaging 89.5 million train-miles annually, the accident rate increased to 11.5 accidents per million train-miles in 2003, compared to 11.0 in 2002, but decreased compared to the 1998-2002 average rate of 11.9. Rail-related fatalities reached a 21-year low of 79 in 2003, compared to 96 in 2002 and the 1998-2002 average of 98.

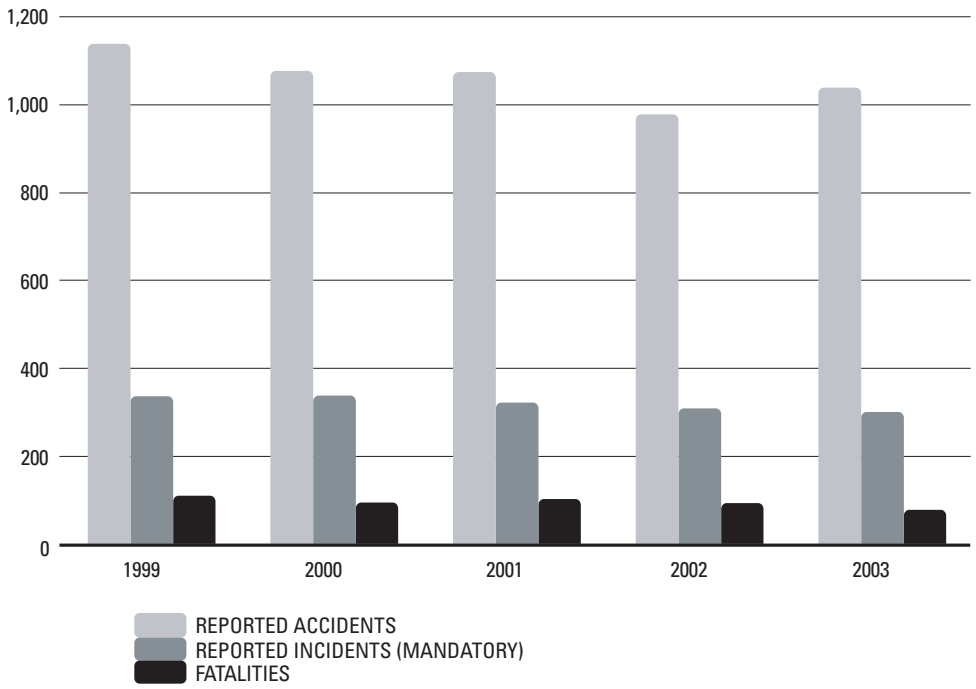
Main-track collisions totalled 6 in 2003, compared to 8 in 2002 and the 1998-2002 average of 10. In 2003, there were 148 main-track derailments—a 28% and 25% increase respectively over the 2002 total of 116 and the 1998-2002 average of 118. Non-main-track collisions totalled 104 in 2003, a 7% decrease over the 112 reported in 2002, but comparable to the 1998-2002 average of 105. Non-main-track train derailments numbered 388 in 2003, up from 347 in 2002 and the 1998-2002 average of 382.

There were 247 crossing accidents in 2003, down from 261 in 2002 and the 1998-2002 average of 272. In 2003, crossing-related fatalities totalled 27—a 41% and 31% decrease respectively over last year's total of 46 and the 1998-2002 average of 39.

Trespasser accidents (individuals, primarily pedestrians, struck by rolling stock on railway rights-of-way other than at railway crossings) totalled 68 in 2003, down from 73 in 2002 and the 1998-2002 average of 81. There were 46 trespassing fatalities in 2003, down 8% and 19% respectively from last year's total of 50 and the 1998-2002 average of 57.

Reported rail incidents reached a 21-year low of 295 in 2003, down from 303 in 2002 and the 1998-2002 average of 345. Dangerous-goods leakers not related to train accidents annually account for the largest proportion of total incidents. There were 151 dangerous-goods leakers in 2003, down from 167 in 2002 and the 1998-2002 average of 198.

FIGURE 7 – RAIL OCCURRENCES AND FATALITIES



RAIL INVESTIGATIONS STARTED IN 2003-2004

The following information is preliminary. Final determination of events is subject to the TSB's full investigation.

DATE	LOCATION	COMPANY	EVENT	OCCURRENCE NO.
2003.05.12	Manseau, Que.	Canadian National	Main-track train derailment	R03Q0022
2003.05.14	McBride, B.C.	Canadian National	Main-track train derailment	R03V0083
2003.05.21	Brechin East, Ont.	Canadian National	Main-track train derailment	R03T0157
2003.05.21	Green Valley, Ont.	Canadian Pacific	Main-track train derailment	R03T0158
2003.07.30	Villeroy, Que.	Canadian National	Main-track train derailment	R03Q0036
2003.10.19	Upsala, Ont.	Canadian Pacific	Main-track train derailment	R03W0169
2003.10.24	Swansea, B.C.	Canadian Pacific	Main-track train derailment	R03C0101
2004.01.08	New Hamburg, Ont.	VIA Rail Canada	Main-track train derailment	R04S0001
2004.01.14	Whitby, Ont.	Canadian Pacific	Main-track train derailment	R04T0008
2004.01.22	Bolton, Ont.	Canadian Pacific	Main-track train derailment	R04T0013
2004.02.07	Montmagny, Que.	Canadian National	Main-track train derailment	R04Q0006
2004.02.17	Winnipeg, Man.	Canadian National	Non-main-track train derailment	R04W0035
2004.03.04	Penhold, Alta.	Canadian Pacific	Main-track train derailment	R04E0027
2004.03.17	Linton, Que.	Canadian National	Main-track train derailment	R04Q0016
	Various locations across Canada	Canadian Pacific and Canadian National	Main-track train derailments	Safety Issue Investigation

RAIL REPORTS RELEASED IN 2003-2004

DATE	LOCATION	COMPANY	EVENT	REPORT NO.
1999.01.19	Trenton Junction, Ont.	VIA Rail Canada	Movement exceeds limits of authority	R99T0017
2000.01.30	Newcastle, N.B.	VIA Rail Canada NBEC	Non-main-track train collision	R00M0007
2000.09.28	Acton, Ont.	VIA Rail Canada	Crossing accident	R00T0257
2000.12.11	Anita, Ont.	Canadian National	Main-track train derailment	R00W0253
2000.12.12	Lloydminster, Sask.	Canadian Pacific	Main-track train derailment	R00E0126
2001.01.16	Mallorytown, Ont.	Canadian National	Main-track train derailment	R01T0006
2001.02.15	Drummondville, Que.	Canadian National	Main-track train derailment	R01Q0010
2001.08.29	Montreal, Que.	Canadian National	Non-main-track train derailment	R01D0097
2001.10.01	Broadview, Man.	Canadian Pacific	Main-track train derailment	R01W0182
2002.02.15	Dartmouth, N.S.	Canadian National	Non-main-track train derailment	R02M0007
2002.02.22	Port Hope, Ont.	Canadian Pacific	Main-track train collision	R02T0047
2002.03.24	Glenogle, B.C.	Canadian Pacific	Main-track train collision	R02C0022
2002.04.26	Winnipeg, Man.	Canadian National	Main-track train derailment	R02W0060
2002.04.28	Natal, B.C.	Canadian Pacific	Main-track train collision	R02V0057
2002.07.23	Carstairs, Alta.	Canadian Pacific	Main-track train derailment	R02C0054

RAIL RECOMMENDATIONS ISSUED IN 2003-2004

RECOMMENDATION	RESPONSE SUMMARY	BOARD ASSESSMENT OF RESPONSE	SAFETY ACTION TAKEN
Trenton Junction, Ontario – 19 January 1999 Movement Exceeds Limits of Authority – VIA Rail Canada			Occurrence No. R99T0017
R03-02 The Department of Transport, in conjunction with the railway industry, establish comprehensive national standards for locomotive data recorders that include a requirement for an on-board cab voice recording interfaced with on-board communications systems.	TC has indicated a partial acceptance of the recommendation, and has initiated a project to provide advice on the establishment of standards. However, no policy or procedures have been established yet.	Satisfactory in part	TC has finalized the Terms of Reference for the purposes of creating a Project Team on the development of national standards for addressing the survivability of locomotive event recorders. The team will consist of representatives from TC, the Railway Association of Canada (RAC), Federal Railroad Administration (FRA), rail industry unions and others as required.
Acton, Ontario – 28 September 2000 Crossing Accident – VIA Rail Canada			R00T0257
R03-03 The Department of Transport implement new grade crossing procedures without delay irrespective of the status of the proposed regulations.	The Railway Association of Canada has drafted manual protection practices but TC has not yet promulgated the regulations.	Unsatisfactory	As part of the *Regulatory Impact Analysis Statement*, TC is obligated to estimate the cost of implementing the regulatory proposal. A Grade Crossing Regulations Working Group was established to examine the costs associated with implementing the proposed regulations and to complete work on the proposed regulations, technical standards and cost benefit analysis. The new grade crossing regulations have not yet been published in *Canada Gazette,* Part I, making it unlikely they will come into effect before the end of 2004.

RECOMMENDATION	RESPONSE SUMMARY	BOARD ASSESSMENT OF RESPONSE	SAFETY ACTION TAKEN
McBride, British Columbia – 14 May 2003 Main-Track Train Derailment – Canadian National			R03V0083
R03-04 CN verify the condition of its timber bridges and ensure their continued safety with effective inspection and maintenance programs.	CN did not completely accept the Board recommendation. However, CN is in the process of developing a comprehensive, computerized Bridge and Culvert Condition System (BCS), to provide a means for consistent component ranking utilizing a numeric ranking system better suited to tracking component deterioration and the appropriate scheduling of needed repairs. The system will be rolled out in June 2004, and should provide a higher level of confidence in CN's bridge condition tracking systems.	To be reported next fiscal year.	
R03-05 The Department of Transport incorporate in its compliance reviews a comparison of railway working procedures and practices with railway inspection and maintenance records.	TC is developing an auditing practice to assess the efficacy of CN's Safety Management System for inspection and maintenance of bridges. By incorporating compliance reviews with the comparison of working procedures and practices and by examining railway records, TC will have a better opportunity of discovering gaps in railway management of bridge condition assessment and repair.	To be reported next fiscal year.	

ASSESSMENT OF RESPONSES TO RAIL RECOMMENDATIONS ISSUED IN 2002-2003

RECOMMENDATION	RESPONSE SUMMARY	BOARD ASSESSMENT OF RESPONSE	SAFETY ACTION TAKEN
Chalk River, Ontario – 20 June 2000 Main-Track Train Derailment – Ottawa Valley Railway			Occurrence No. R00H0004
R03-01 The Department of Transport, in cooperation with the industry, research the issue of continuous operation of undesired emergency (UDE) problematic trains and establish policies and procedures to resolve this issue.	Research was completed, but policies and procedures were not established.	Satisfactory in part	Transport Canada (TC) committed to work with the TSB, the Railway Association of Canada and the Canadian rail industry to assist in assessing the risk level of this issue by utilizing an integrated risk management process. CN and CP have advised TC that since 1990, there has been a significant reduction in the frequency of UDEs, and the industry continues to work towards further reducing this frequency with ongoing programs designed to improve train marshalling and train handling in conjunction with improved control valve designs. Given this information, TC has determined that a further comprehensive analysis of this issue is not warranted at this time.

OTHER RAIL SAFETY ACTION TAKEN

- CP amended their General Operating Instructions, governing train brake tests, to prescribe that a service application and release of the train air brakes must be obtained without an undesired emergency air brake application, for the test to be considered successful.
- VIA Rail Canada conducted refresher training on the importance of readings from the wheel impact load detectors (WILDs). VIA implemented a two-phase inspection of all Light, Rapid Comfortable axles. The first phase involves ultrasonic inspection with the wheel set still under the car. In the second phase, all axles are removed and a more detailed ultrasonic inspection is performed. A dye penetrant inspection of the surface is also done.
- CN implemented a cold weather Temporary Slow Order policy of 30 mph below -25°C for portions of track with higher rail defect counts or a history of in-service rail failures.
- CP has modified all hot box detectors to broadcast the ambient temperature in degrees Celsius as soon as a train has passed by the detector. In hot weather zones, as indicated by Bulletin or General Bulletin Order, if the ambient is above 32°C the train operation is restricted to 40 mph, and in cold weather zones the operating speed is restricted to 35 mph if the ambient temperature falls below -25°C.
- CN and CP are participating in the Rail Integrity Task Force committee with the United States Federal Railroad Administration to investigate root causes of broken rail derailments and rail failures.
- CP has tightened track evaluation car thresholds for rock and roll surface roughness and cross-level defects in Class 2 track from the original Class 2 levels to Class 3 levels.
- CP, CN and TC are participating in a research program relating track geometry characteristics to lateral/vertical ratios for instrumented hopper car wheel sets.
- CN and CP have jointly installed a Trackside Acoustic Detector System (TADS) on the directionally shared trackage in BC. The TADS is designed to identify roller bearings with internal defects, prior to the bearings overheating and failure. The TADS is ethernet linked to the Association of American Railroads (AAR) monitoring centre. The TADS has a proven 97% success rate in defective bearings identified.
- The AAR has implemented a new rule that all turned wheels must pass an ultrasonic scan before being released in order to eliminate shattered rim events on turned wheel sets.
- CN and CP have established new criteria and procedures for handling cars which have been identified by WILD as having potentially defective wheels. The Railway Association of Canada is developing an industry policy on WILD response.

- CP has developed a computerized system of train marshalling instructions to enable the operation of heavier trains, and Locotrol trains with a mix of different car types, both loaded and empty. The Train Area Marshalling system has specific computer-supported marshalling instructions for each of the five areas of CP, defined by their combination of grade and curvature. The relatively restrictive marshalling instructions that apply to trains operating on mountain grades, for instance, do not apply to trains operating in areas of lower grades and curvatures.
- TC has approved new Light Emitting Diode (LED) technology for use in flashing light signals at highway/railway grade crossings. The lights last longer and are visible from a greater distance.
- TC approved the Work/Rest Rules for Rail Operating Employees effective in 2003. The railways have implemented Fatigue Management Plans for their operating employees.
- CN and Ultramar have delivered TransCARE, a Community Awareness and Response program, to the communities along the route of the Ultramar fuel train between the refinery at Saint-Romuald and Montréal. The program has been presented to TC for review by TC's remedial measures specialists.
- In Windsor, Ontario, there has been increased education and awareness in the schools and media to address the safety issue of trespassing. A six-foot-high fence has been installed with a key access gate. The city has adjusted bus routes and bus stop locations away from trespass areas. The anti-whistling instructions at certain crossings were revoked.
- TC has directed that a Hump Yard Control System Study be initiated to gain an in-depth understanding of how the speed of dangerous goods rail cars are controlled in Canadian hump yards.

ANNUAL STATISTICS

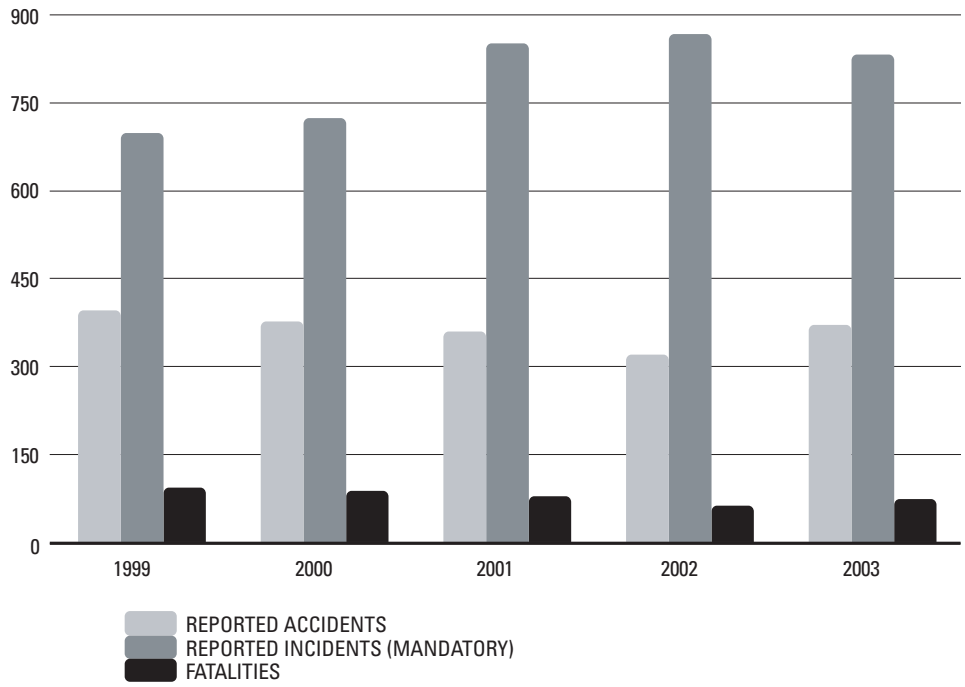
Canadian-registered aircraft, other than ultralights, were involved in 296 reported accidents in 2003, an 8% increase from the 2002 total of 274. However, this is an 8% decrease from the 1998-2002 average of 323. Flying activity in 2003 is estimated to have increased by 3% from 2002 to 3,789,725 hours. This resulted in an accident rate of 7.8 accidents per 100,000 flying hours compared to the 2002 accident rate of 7.4 and the 1998-2002 average rate of 8.3. Canadian-registered aircraft, other than ultralights, were involved in 31 fatal occurrences in 2003, with 58 fatalities. This is slightly fewer than the 1998-2002 average of 33 fatal occurrences, with 66 fatalities. About half the fatal occurrences involved privately operated aircraft; 3 of the remaining 14 fatal occurrences involved helicopters.

The number of accidents involving ultralights increased from 36 in 2002 to 46 in 2003. However, the number of fatal accidents decreased from 9 accidents with 12 fatalities in 2002 to 7 accidents with 9 fatalities in 2003.

The number of foreign-registered aircraft involved in accidents in Canada increased from 13 in 2002 to 30 in 2003. Fatal accidents increased from 1 accident with 2 fatalities in 2002 to 6 accidents with 8 fatalities in 2003.

In 2003, a total of 834 incidents were reported in accordance with TSB mandatory reporting requirements. This represents a 4% decrease from the 2002 total of 865, but a 7% increase from the 1998-2002 average of 783.

FIGURE 8 – AIR OCCURRENCES AND FATALITIES



AIR INVESTIGATIONS STARTED IN 2003-2004

The following information is preliminary. Final determination of events is subject to the TSB's full investigation.

DATE	LOCATION	AIRCRAFT TYPE	OCCURRENCE NO.
2003.04.07	Lake Temagami, Ont.	Found Brothers FBA-2C1	A03O0088
2003.04.09	CYPE Peace River, 13 nm SE, Alta.	Robinson Helicopter R44	A03W0074
2003.04.23	CYPA Prince Albert (Glass Field), 6 nm SW, Sask.	Beech 99	A03C0094
2003.05.22	CJS9 Lac du Bonnet (North), Man.	de Havilland DHC-3	A03C0118
2003.05.22	Active Pass, B.C.	de Havilland DHC-3 Sikorsky S-76A	A03P0113
2003.05.31	CYCW Chilliwack, 7.5 nm E, B.C.	Cessna 182	A03P0133
2003.06.05	Lake Wicksteed, Ont.	de Havilland DHC-6-300	A03O0135
2003.06.06	Lillooet, 30 nm NW, B.C.	Bell Helicopter 206B	A03P0136
2003.06.17	Gisborne, New Zealand	Convair 340/580	A03F0114
2003.06.24	Wasaga Beach, 5 mi WSW, Ont.	Mooney 20 E	A03O0156
2003.06.26	A036 Buchans, 25 nm SE, N.L.	Polskie Zaklady Lotnicze PZL-18	A03A0076
2003.07.04	Lac Boucher, Que.	Bell Helicopter 206B	A03Q0092
2003.07.07	CYTZ Toronto/City Centre, Ont.	Beech 58	A03O0171
2003.07.13	Manning, 75 nm NE, Alta.	Bell Helicopter 204B	A03W0148
2003.07.16	Cranbrook, 9 nm SE, B.C.	Lockheed 188A	A03P0194
2003.07.18	Harrison Hot Springs, 24 nm NNW, B.C.	Cessna 172M	A03P0199
2003.07.26	CYQB Québec/Jean Lesage Intl, 6 nm E, Que.	Cessna 172M	A03Q0109
2003.08.05	London, 40 nm NE, Ont.	Boeing 767-200 Fokker F-28 MK 100	A03O0213
2003.08.10	CYDC Princeton, B.C.	Cessna 210 A	A03P0239
2003.08.11	CYZT Port Hardy, 26 nm W, B.C.	Boeing 757-200 Boeing 747-400	A03P0244
2003.08.17	Bonaparte Lake, B.C.	Bell Helicopter 204B	A03P0247
2003.08.23	Vernon, B.C.	Airbus A319-100	A03P0259
2003.08.29	Penticton, 10 nm N, B.C.	de Havilland DHC-2	A03P0265
2003.09.03	CYHC Vancouver Harbour, B.C.	de Havilland DHC-6-200	A03P0268
2003.09.11	CJV7 Summer Beaver, 3 nm W, Ont.	Cessna 208 B	A03H0002
2003.09.16	Mayo, 80 nm N, YT	Bell Helicopter 206B	A03W0194
2003.09.23	CYYC Calgary, 49 nm S, Alta.	Cessna 414 A	A03W0202
2003.09.26	CYYZ Toronto/Lester B. Pearson Intl, Ont.	Israel Aircraft (IAI) Astra SPX	A03O0273
2003.09.27	CYGP Gaspé, 2 nm NE, Que.	Piper PA-31	A03Q0151
2003.10.04	Linda Lake, B.C.	Piper PA-18-150	A03W0210
2003.10.09	CYKZ Toronto/Buttonville Municipal, 2 nm SSE, Ont.	Cessna 172N	A03O0285
2003.11.04	CYOW Ottawa/MacDonald-Cartier Intl, Ont.	de Havilland DHC-8-100	A03O0302
2003.11.06	CYVR Vancouver Intl, B.C.	Airbus A330-300	A03P0332
2003.12.16	Jellicoe, Ont.	de Havilland DHC-3	A03O0341
2004.01.13	La Grande, 160 nm SSW, Que.	Boeing 777-200 Boeing 767-300	A04Q0003
2004.01.15	CYHD Dryden Regional, Ont.	Fairchild SA-227-AC	A04C0016
2004.01.17	CYPT Pelee Island, 0.5 nm W, Ont.	Cessna 208 B	A04H0001

DATE	LOCATION	AIRCRAFT TYPE	OCCURRENCE NO.
2004.01.19	CYYZ Toronto/Lester B. Pearson Intl, Ont.	Airbus A321	A04O0016
2004.01.26	CYYZ Toronto/Lester B. Pearson Intl, Ont.	Boeing 767-200	A04O0020
2004.02.20	Prince Rupert, 40 nm SSE, B.C.	Robinson Helicopter R22 Mariner	A04P0033
2004.02.25	CYEG Edmonton Intl, Alta.	Boeing 737-200	A04W0032
2004.03.03	CYVR Vancouver Intl, B.C.	Boeing 737-200 Cessna 182D	A04P0047
2004.03.04	Swift Current 3.8 nm SW, Sask.	Bell Helicopter 206B	A04C0051
2004.03.08	CTG2 St-Hubert Helicraft, Que.	Schweizer 269C (300C)	A04Q0026
2004.03.12	Nanaimo, 20 nm NW, B.C.	Cessna 185E Cessna 185F	A04P0057
2004.03.20	Ralf, Sask.	Baby Bell Helicopter	A04C0064

AIR REPORTS RELEASED IN 2003-2004

DATE	LOCATION	AIRCRAFT TYPE	EVENT	REPORT NO.
2001.02.15	VCBI Colombo, Sri Lanka	Airbus A330-300	Loss of engine power	A01F0020
2001.04.03	Sydney, 12 nm W, N.S.	de Havilland DHC-8-100	Multiple engine flame-outs	A01A0030
2001.04.04	CYYT St. John's Intl, N.L.	Boeing 737-200	Runway overrun	A01A0028
2001.06.05	CCH4 Charlottetown, P.E.I.	Piper PA-31-310	Collision with terrain	A01A0058
2001.06.27	Roberval, 80 nm N, Que.	Bell Helicopter 212	Fuel exhaustion – hard landing	A01Q0105
2001.07.22	Abbotsford Parachute Centre, 1.5 nm SW, B.C.	Pilatus PC-6T	Loss of engine power – forced landing	A01H0003
2001.10.08	CYYY Mont-Joli, 22 nm SE, Que.	Piper PA-23	Loss of control – stall – collision with terrain	A01Q0165
2001.11.08	Buhl Creek, B.C.	Aerospatiale SA 315B	Loss of engine power – collision with terrain	A01P0282
2002.02.01	CYXX Abbotsford, B.C.	Boeing 737-200	In-flight engine nose dome detachment	A02P0021
2002.03.04	CYYR Goose Bay, N.L.	Fairchild SA-227-AC	Loss of directional control – collision with snowbank	A02A0030
2002.03.26	CEK4 Blairmore (Forestry), 12 nm N, Alta.	Eurocopter AS 350D	Loss of control – hard landing	A02W0057
2002.04.18	SU34 Hare Field, Ont.	Schweizer 269C (300C)	Loss of control – collision with terrain	A02O0105
2002.04.25	Stephenville, 38 nm ESE, N.L.	Beech 1900D	Window failure – rapid depressurization	A02A0046
2002.04.25	Saskatoon, 63 nm E, Sask.	Boeing 747-200 Boeing 747-400	Risk of collision	A02C0079
2002.05.21	CCW4 Stanley, N.S.	Schempp-Hirth KG Cirrus	Seat failure – loss of control	A02A0065
2002.05.27	CZJN Swan River, Man.	Cessna TU206 F	Loss of engine power – forced landing	A02C0105
2002.06.02	Tobin Lake, Sask.	Bell Helicopter 205A-1	In-flight engine fire – forced landing	A02C0114

DATE	LOCATION	AIRCRAFT TYPE	EVENT	REPORT NO.
2002.06.06	Needle Peak, B.C.	Cessna 182P	Visual flight rules (VFR) flight into adverse weather – collision with terrain	A02P0109
2002.06.11	Winnipeg, Man.	Piper PA-31-350	Fuel exhaustion – collision with terrain	A02C0124
2002.06.14	EDDF Frankfurt/Rhein-Main Intl, Germany	Airbus A330-343	Tail strike on take-off	A02F0069
2002.06.19	Kamloops, B.C.	McDonnell Douglas Helicopter 369D (500D)	Main rotor blade failure	A02P0126
2002.06.20	North Atlantic (Cymon Intersection)	Boeing 747-400 Boeing 767 Boeing 767-300	Loss of separation – risk of collision	A02A0079
2002.06.27	CYQF Red Deer (Vicinity), Alta.	British Aerospace Jetstream 3112 Fairchild SA227-DC	Loss of separation – risk of collision	A02W0115
2002.06.28	Sasaginnigak Lake, 10 nm S, Man.	de Havilland DHC-2 MK I	Loss of engine power – forced landing	A02C0143
2002.06.29	Engemann Lake, Sask.	Cessna 185 F	Collision with water	A02C0145
2002.07.01	CZBB Boundary Bay, B.C.	Cessna 172 N	Aircraft stall on take-off – collision with terrain	A02P0136
2002.08.08	Wendle Creek, B.C.	Sikorsky S-61L	Loss of main rotor drive – collision with terrain	A02P0169
2002.08.18	CYYR Goose Bay, N.L.	Bell Helicopter 212	Loss of control – collision with terrain	A02A0098
2002.09.04	CZHP High Prairie, 7 nm SE, Alta.	Piper PA-34-220T	Collision with terrain	A02W0173
2002.09.18	CYYZ Toronto/Lester B. Pearson Intl, Ont.	Piper PA-44-180 de Havilland DHC-8	Loss of separation	A02H0002
2002.09.28	Natashquan, 57 nm N, Que.	de Havilland DHC-3	Collision with terrain	A02Q0130
2002.10.15	Porcher Inlet, B.C.	McDonnell Douglas Helicopter 369D (500D)	Collision with water	A02P0256
2002.11.12	CYZP Sandspit, B.C.	Cessna 550	Gear-up landing	A02P0290
2002.11.20	CYVR Vancouver Intl, B.C.	Boeing 747-200 Shorts SD3-60	Loss of separation – risk of collision	A02P0299
2003.01.11	CYYT St. John's Intl, N.L.	Beech 1900D	Collision with windrow	A03A0002
2003.01.29	CYPM Pikangikum, 2 nm SW, Ont.	Beech 99	Collision with terrain	A03C0029
2003.02.02	CYHZ Halifax Intl Airport, N.S.	Boeing 737-200	Loss of directional control	A03A0012
2003.02.04	Badger, 19 nm WNW, N.L.	Cessna 188 B	Fuel starvation – forced landing	A03A0013
2003.02.11	CYQG Windsor, Ont.	Airbus A320-200	Runway excursion	A03O0034
2003.05.22	CJS9 Lac du Bonnet (North), Man.	de Havilland DHC-3	Engine failure – forced landing	A03C0118

AIR RECOMMENDATIONS ISSUED IN 2003-2004

RECOMMENDATION	RESPONSE SUMMARY	BOARD ASSESSMENT OF RESPONSE	SAFETY ACTION TAKEN
Peggy's Cove, Nova Scotia – 2 September 1998 Smoke in the Cockpit – Swissair MD-11HB-IWF			Occurrence No. A98H0003
A03-01 Regulatory authorities quantify and mitigate the risks associated with in-service thermal acoustic insulation materials that have failed the Radiant Panel Test (RPT).	TC's response contends that a material's failure to pass the RPT is not, in and of itself, indicative of an unsafe material. Rather TC argues that metallized polyethylene terephthalate, the only thermal acoustic insulation cover material which has been deemed to be unsafe by the Federal Aviation Administration (FAA), was so designated because of both its ease of ignition from a small ignition source and propensity to propagate fire.	Unsatisfactory	No action taken to date.
A03-02 Regulatory authorities develop a test regime that will effectively prevent the certification of any thermal acoustic insulation materials that, based on realistic ignition scenarios, would sustain or propagate a fire.	An advisory circular (AC) designed to complement the rule change implementing the RPT is under development by the FAA. TC intends to adopt the RPT and will be reviewing this FAA AC for application to its own relevant regulations.	Satisfactory intent	No action taken to date.
A03-03 Regulatory authorities take action to ensure the accurate and consistent interpretation of the regulations governing material flammability requirements for aircraft materials so as to prevent the use of any material with inappropriate flammability characteristics.	TC intends to contact the FAA to request that this issue be considered by its International Aircraft Materials Fire Test Working Group. The group, which involves Civil Aviation Authorities (CAAs), including TC, and the international aviation industry, is the prime focus for the development of aircraft materials' flammability test criteria and standards.	Satisfactory intent	No action taken to date.
A03-04 Regulatory authorities require that every system installed through the supplementary type certificate (STC) process undergo a level of quantitative analysis to ensure that it is properly integrated with aircraft type-certified procedures, such as emergency load-shedding.	TC did not agree that a quantitative assessment is always required for every system installed through the STC process, and stated that the regulatory requirements are in place to deal with the approval of STCs. TC plans to develop advisory material emphasizing the need to verify that system integration requirements are adequately addressed during the STC process, to initiate awareness training for industry delegates and TC certification engineers, focussing on "non-essential, non-required" systems, and to continue its harmonization efforts related to US Federal Aviation Regulation 25.1309.	Unsatisfactory	No action taken to date.
A03-05 Regulatory authorities establish the requirements and industry standard for circuit breaker resetting.	TC concurred with the TSB recommendation. TC plans to submit a request that the FAA's Aviation Rulemaking Advisory Committee's Transport Aircraft and Engines Issues Group establish the requirements and industry standards for circuit breaker resetting. The objective would be to produce harmonized standards for use by the Civil Aviation Authorities (e.g. FAA, Joint Aviation Authorities and TC) of major aircraft manufacturing states.	Satisfactory intent	No action taken to date.

RECOMMENDATION	RESPONSE SUMMARY	BOARD ASSESSMENT OF RESPONSE	SAFETY ACTION TAKEN
A98H0003 (Continued)			
A03-06 Regulatory authorities, in concert with the aviation industry, take measures to enhance the quality and intelligibility of cockpit voice recorder (CVR) recordings.	TC concurred with the intent of this recommendation. TC acknowledged that the clarity of the CVR recording is improved when the flight crew uses the boom microphones; however, their continuous usage can lead to crew fatigue. To improve the quality of the CVR recording, TC plans to develop a Notice of Proposed Amendment (NPA), to amend the regulatory requirement for the use of boom microphones from a maximum altitude of 10,000 feet to 18,000 feet above sea level.	Satisfactory intent	No action taken to date.
A03-07 Regulatory authorities require, for all aircraft manufactured after 1 January 2007 which require a flight data recorder (FDR), that in addition to the existing minimum mandatory parameter lists for FDRs, all optional flight data collected for non-mandatory programs such as flight operational quality assurance or Flight Data Monitoring, be recorded on the FDR.	TC's response did not support the deficiency in recommendation A03-07. Rather, it stated that it plans to work with all concerned to enhance the FDR capability as requirements change. There is no indication in its response to suggest any technical objection to supplementing the current FDR parameters. TC has expressed a concern that any attempt to capture Flight Data Monitoring (FDM) data on FDRs would jeopardize the FDM safety initiative. However, it does not explain why requiring FDRs to be easily augmented with additional parameters and routinely and readily accessed without requiring re-certification would put the FDM program at risk.	Unsatisfactory	No action taken to date.
A03-08 Regulatory authorities develop harmonized requirements to fit aircraft with image recording systems that would include imaging within the cockpit.	TC supported the recommendation concerning the installation of image recording systems to supplement the current flight recording requirements. It stated an intention to work with other CAAs to develop a harmonized approach to image recorder system standards and to take regulatory action to implement the requirement to install video imaging equipment in cockpits of transport category aeroplanes in commercial service.	Satisfactory intent	No action taken to date.
A03-09 Regulatory authorities harmonize international rules and processes for the protection of cockpit voice and image recordings used for safety investigations.	TC agreed that all cockpit voice and image recordings used for safety investigations should be protected; that the appropriate forum to gain the necessary international agreement and harmonized implementation of this recommendation is the International Civil Aviation Organization (ICAO). TC plans to bring this recommendation to the attention of the ICAO through Canada's representative.	Satisfactory intent	No action taken to date.

ASSESSMENT OF RESPONSES TO AIR RECOMMENDATIONS ISSUED IN 2002-2003

RECOMMENDATION	RESPONSE SUMMARY	BOARD ASSESSMENT OF RESPONSE	SAFETY ACTION TAKEN
Lester B. Pearson International Airport, Ontario – 13 May 2002 Cargo Bay Fire – Air Canada, Boeing 767-300			A02O0123
A02-04 The Department of Transport take action to reduce the short-term risk and eliminate the long-term risk, of heater ribbon installation failures starting fires, and coordinate and encourage a similar response from other appropriate regulatory authorities.	TC indicates that it shares a similar concern and is working closely with the FAA, Boeing and other foreign civil aviation authorities to assess and study the short- and long-term risks of heater ribbon installations, and to determine an appropriate means of addressing the issue. The FAA indicates that it intends to issue a Service Bulletin and subsequent Airworthiness Directive for more reliable heater ribbons in open cargo bay areas on the Boeing 767 and 747 aircraft.	Satisfactory intent	No action taken to date.
A02-05 The Department of Transport take action to reduce the short-term risk and eliminate the long-term risk, of contaminated insulation materials and debris propagating fires, and coordinate and encourage a similar response from other appropriate regulatory authorities.	TC indicates that it shares a similar concern and is working closely with the FAA, Boeing and other foreign civil aviation authorities to assess and study the short- and long-term risks of heater ribbon installations, and to determine an appropriate means of addressing the issue in both the short and long term. The FAA indicates that it intends to implement a new maintenance process for airplane manufacturers to remove debris from wiring areas called Enhanced Zonal Analysis Procedure (EZAP). EZAP will result in more effective scheduled maintenance.	Satisfactory intent	No action taken to date.

OTHER AIR SAFETY ACTION TAKEN

- TC identified to NAV CANADA a safety deficiency concerning the degraded performance of anemometers due to ice accretion and has requested that NAV CANADA implement software changes that would suppress incorrect wind information under these conditions.
- NAV CANADA issued a station bulletin to all St. John's Flight Service Station personnel clarifying the procedure for reporting estimated winds in an aviation routine weather report. NAV CANADA also issued a bulletin to all units informing air traffic services units personnel to be vigilant during icing conditions and the actions to be taken if they suspect the anemometer is affected by ice accretion.
- Following an accident involving an input freewheel unit failure, TC published an article entitled "Freewheel Units" in *Vortex*, Issue 2/2002. The operator reduced the inspection interval for the component to 400 hours and the aircraft manufacturer issued a Safety Alert reminding operators of the maintenance manual's requirement for a specific inspection requirement for the part.
- Following an in-flight engine nose dome detachment, TC communicated with the FAA regarding a possible Airworthiness Directive to have all engine accessory supports replaced with modified accessory supports that have been strengthened.
- WestJet Airlines carried out a fleet-wide campaign to replace all engine accessory supports with modified accessory supports.
- TC is conducting a review of the applicable Bell 205A-1 instructions for continuing airworthiness to determine if action is necessary regarding the instructions for the installation of starters/generators and fuel lines.
- Following an accident involving fuel exhaustion followed by collision with terrain, TC conducted a post-accident regulatory audit and — at the request of the company — a systems safety review.
- Following a loss of separation occurrence, NAV CANADA Toronto ACC revised control procedures to include the requirement of matching radar targets to flight data strips as part of sector hand-over procedures.
- Following a collision with terrain accident, TC recommended that the company amend its standard operating procedures to state that after take-off, no turns will be performed below 1000 feet above ground level unless instructed to do so by air traffic control.
- In response to a series of engine failures, the operator's Flight Operations Training Department amended the training program in areas specifically dealing with the recognition of turbine engine malfunctions, Extended Range Twin-Engined Aircraft Operations diversion procedures and in-flight communications. The engine manufacturer issued two Alert Service Bulletins to provide inspection procedures for specific engine parts.

- Following a double engine flame-out in the presence of ice on the lower engine nacelle cowl, the aircraft manufacturer issued a revised ground procedure training guide containing a more detailed description of the areas to be inspected and cleaned, and issued a Customer Special Installation on enlarging drain holes in the engine air inlet ducts. The operator incorporated the revised procedures into its training program.
- Following an aircraft window failure in flight, the operator issued a Quality Assurance Bulletin changing the inspection schedule from 1200 hours to 200 hours. TC reviewed the operator's standard operating procedures to determine if improvements could be recommended.
- NAV CANADA issued an Operations Bulletin to personnel in the Edmonton Area Control Centre, drawing their attention to the necessity of following *ATC MANOPS* in matters pertaining to strip marking for aircraft operating at altitudes inappropriate for direction of flight. NAV CANADA also issued a Notice to Airmen and made permanent corrections to an en route pilotage chart which had depicted inaccurate information regarding an airway.
- Following a gear-up landing occurrence, the operator decided to require the fitting of a Ground Proximity Warning System on all fixed wing aircraft operated on their behalf by contracted carriers.
- TC proposed an amendment to the *Canadian Aviation Regulations*, which would require passenger-carrying aircraft of the class involved in the gear-up landing occurrence to be equipped with specific types of terrain avoidance warning systems.
- As a result of a loss of separation occurrence at Vancouver International Airport, NAV CANADA revised the Vancouver Tower Class C airspace procedures to require all arriving and departing aircraft operating under visual flight rules to obtain discreet transponder codes so that all aircraft tracked by radar might be correlated with flight number and flight plan information and be more conspicuous on the radar display.

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 *Transportation Safety Board Regulations*)
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 *Transportation Safety Board Regulations*)
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 of government
Safety Information Letter	A letter that communicates safety-related information, often concerning local safety hazards, to government and corporate officials