Transportation Safety Board of Canada

Bureau de la sécurité des transports du Canada

Annual Report to Parliament 2007-2008

Transportation Safety Board of Canada

Canada

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ANNUAL REPORT TO PARLIAMENT 2007-2008

Place du Centre
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02 June 2008

The Honourable Rona Ambrose, 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 01 April 2007 to 31 March 2008.

Yours sincerely,

Wendy A. Tadros
Chair

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The Chair's Message

When a marine, pipeline, rail, or aviation accident befalls Canadians, the Transportation Safety Board of Canada (TSB) stands ready to conduct a full and independent investigation. That is why TSB investigators report again and again to the scenes of accidents, often under the most challenging of conditions, be those scouring ocean floors for wreckage, working with hazardous debris or walking miles of track to advance transportation safety.

When our work is done, we always tell Canadians what we learned. We report what caused the accident, what underlying safety issues there are and what needs to be done to improve the safety of our transportation system. At the TSB, we believe, in some measure, that our recommendations serve to save lives, preserve the environment and protect the property of Canadians.

To this end, the past year has been another busy year for the TSB. We have released a number of high-profile investigation reports including our investigations of derailments along the Cheakamus River in British Columbia and Lake Wabamun in Alberta, our investigations of the grounding of the BC Ferries *Queen of Oak Bay* and the sinking of the BC Ferries *Queen of the North*, and numerous investigations involving private and commercial aircraft such as the loss of a rudder from an Air Transat aircraft and the overrun of an Air France aircraft at the Toronto/Lester B. Pearson International Airport in Ontario. At the same time, we undertook a number of new investigations including a capsized fishing vessel, an oil pipeline rupture, main-track derailments and two hot air balloon crashes.

No matter the occurrence, the TSB acts quickly to ensure that lessons learned are made public and passed on to those persons and agencies best positioned to take effective action and make changes. This year, the TSB made public its concern over cannabis use on board the BC Ferries *Queen of the North*. More recently, the Board made interim recommendations dealing with the regulation and operation of commercial hot air balloons. The recommendations are based on findings from an ongoing investigation and demonstrate that the cause of safety is quickly served once a TSB investigation begins.

By definition, the TSB is a learning organization. We learn not only about accidents and safety, we also learn about organizational growth and development, about improving our processes and about becoming more efficient. This year, I challenged the management team at the TSB to find ways of improving on the uptake of our recommendations and I am happy to report that work is well underway on this initiative.

I am confident that the TSB will continue to play a strong role to ensure that Canadians will always enjoy one of the safest transportation systems in the world.

Wendy A. Tadros
Chair

Section 1: Overview

1.1 Members of the Board

Chair 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 Kathy Fox
Transportation safety and air traffic services experience includes air traffic controller, commercial pilot, flight instructor, various management positions at Transport Canada, and Vice President of Operations at NAV CANADA. In 1999, received the Transport Canada Aviation Safety Award. In November 2004, was inducted into the Quebec Air and Space Hall of Fame.

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. 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 Walsh is currently on administrative leave.*

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.

1.2 Senior Management

Executive Director	G. McDonald
General Counsel	A. Harding
Director General, Corporate Services	J.L. Laporte
Director General, Investigation Operations	T. Burtch
Director, Marine Investigations Y.	Myers
Director, Rail/Pipeline Investigations	I. Naish
Director, Air Investigations	N. Stoss/M. Clitsome
A/Director, Engineering	J. Foot/T. Givins/D. Rocheleau

1.3 Mission of the TSB

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

1.4 Independence

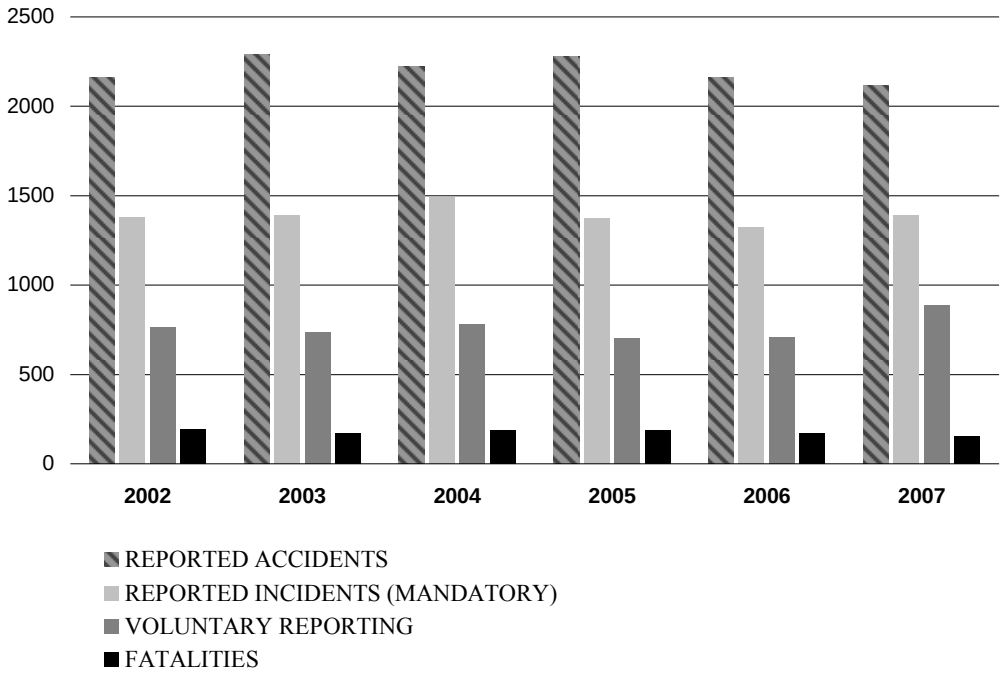
To encourage public confidence in transportation accident investigation, the investigating agency must be, and be seen to be, objective, independent and free from any conflicts of interest. The key feature of the TSB is its independence. It reports to Parliament through the President of the Queen's Privy 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, integrity and the fairness of its processes.

Section 2: Activities

2.1 Occurrences, Investigations and Safety Action

In 2007, a total of 2119 accidents and 1390 incidents were reported in accordance with the TSB's regulations for mandatory reporting of occurrences.[1] The number of accidents in 2007 decreased by 2 per cent from the 2161 accidents reported in 2006 and by 5 per cent from the 2002-2006 annual average of 2223 accidents. The number of reported incidents increased to 1390 in 2007 from 1325 in 2006, but decreased from the 2002-2006 average of 1392. There were also 886 voluntary incident reports. Fatalities totalled 155 in 2007, down 13 from the 2006 total and 26 from the 2002-2006 average.

Figure 1: Occurrences Reported to the TSB

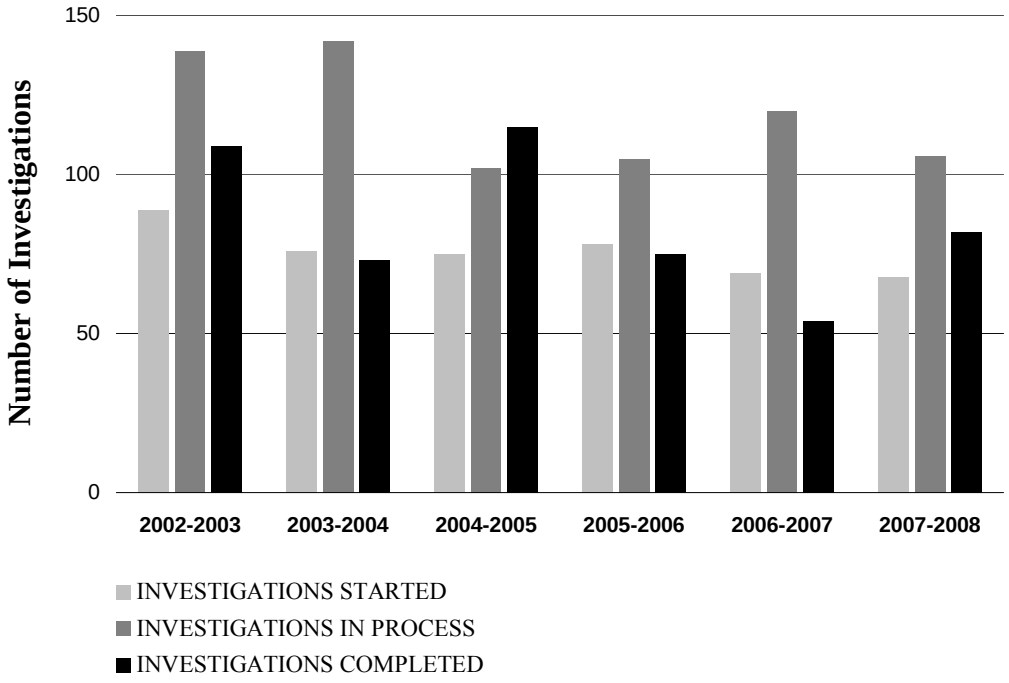


All reported occurrences were examined in accordance with the Board's Occurrence Classification Policy to identify those with the greatest potential for advancing transportation safety. Information was entered into the TSB database for historical record, trend analysis and safety deficiency validation purposes.

[1] While the Board's operations are for the 2007-2008 fiscal year, occurrence statistics are for the 2007 calendar year unless otherwise indicated. Please note that, in a live database, the occurrence data are constantly being updated. Consequently, the statistics can change slightly over time. Comparisons are generally to the last 5 or 10 years. For definitions of terms such as *accident*, *incident* and *occurrence*, see Appendix B.

In fiscal year 2007-2008, investigations were undertaken for 68 of the occurrences reported to the TSB. In that same period, 82 investigations were completed, compared to 57 in the previous year.[2] The number of investigations in process decreased to 106 at the end of the fiscal year from 120 at the start. Average time to complete an investigation increased to 631 days in fiscal year 2007-2008 from 573 days in the previous year.

Figure 2: Investigations Started, in Process, and Completed



Overall, the TSB has been successful in identifying safety deficiencies and in reducing risks in the transportation system. TSB investigations result in reports identifying safety deficiencies and, where appropriate, containing recommendations to reduce risks. Over this past year, in all cases where the TSB undertook an investigation, safety deficiencies or contributing factors were identified and communicated. These results reflect careful application of the TSB's Occurrence Classification Policy in deciding whether to investigate, and a thorough implementation of the investigation methodology. This systematic approach ensures that TSB investigation resources are invested in areas with the greatest potential safety payoffs.

[2] Investigations are considered complete after the final report has been issued. See Appendix A for a list of reports released by the TSB in 2007-2008 by sector.

In 2007-2008, in addition to investigation reports, the TSB issued a total of 85 safety outputs: 18 recommendations, 41 safety advisories and 26 safety information letters (see Table 1 for a breakdown by sector).

Table 1: Safety Outputs by the TSB

Sector	Recommendations[3]	Safety Advisories	Safety Information Letters
Marine 3		12	4
Pipeline 0		0	0
Rail 4		16	13
Air 11		13	9
TOTAL 18		41	26
Note: In 2007-2008, a total of 14 marine safety concerns, 6 rail safety concerns and 1 air safety concern were identified.			

Safety information is also provided informally to key stakeholders throughout the investigation process, permitting them to take immediate safety actions where appropriate. It is common practice for industry and government to take safety actions during the course of TSB investigations. Such safety actions range widely in scope and importance. Operators will often take immediate remedial action after discussion with TSB investigators (for example, to clear the sight-lines at a railway crossing by trimming bushes and vegetation). Regulators such as Transport Canada and the Federal Aviation Administration in the United States regularly issue mandatory directives requiring inspections and/or component replacement based on the TSB's preliminary findings. In such situations, rather than issuing recommendations, the TSB can then report on the corrective actions already taken by industry and government agencies.

In accordance with the *Canadian Transportation Accident Investigation and Safety Board Act*, a federal minister who is notified of a TSB 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. 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 continued to publish on its website (www.tsb.gc.ca) its assessment of industry and government organization responses to its recommendations made after 01 January 2005.

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

2.2 Communicating Transportation Safety to Canadians and the Transportation Community

Communicating lessons learned is a cornerstone of TSB practice. Our efforts are maximized when cutting-edge work is made public and acted upon. To that end, the TSB undertakes a number of activities to ensure the uptake of recommendations and safety action on all of its safety communications. In large part, these activities consist of publishing investigation reports, publicizing recommendations and safety concerns and sustaining safety messages using a variety of means and venues including conferences, publications, news events and the internet.

As in past years, TSB staff and Board members have sought out and participated in conferences and symposia pertinent to transportation safety. This has allowed the TSB to extend the reach of its safety messages and to make the case for safety action to a broader audience. The TSB Outreach Program is beginning to gain momentum. This year, Board members, senior managers and staff attended 21 outreach events to present information and provide insight on transportation safety and the role of the TSB.

In 2007-2008, the TSB published 82 investigation reports, as well as annual and monthly statistical reports. During that period, 1409 new subscribers joined the TSB website for a total of 3474 subscribers. The TSB Macro-Analysis Division responded to 341 requests for complex transportation occurrence database information.

The TSB strives to satisfy both the public and the media's expectation for up-to-date factual information. This year, the TSB added webcasting to its tool belt. Two high-profile final reports were released as webcasts and reached audiences in Europe and the United States. In total, the TSB held 4 news conferences, 4 media availabilities, issued 12 news releases and responded to 694 media calls, not including those inquiries handled at an accident site or at a report release news conference.

The TSB also uses its website to increase awareness of safety issues and other transportation safety information. The TSB website received an average of more than 91 223 daily hits and 5937 daily visits. The majority of visitors are Canadians. However, the website continues to attract visits from all around the world.

Of special significance over the reporting period was Canada's chairing of the International Transportation Safety Association and our hosting of its Annual Meeting in Ottawa. The Annual Meeting brought together representatives from Australia, Europe, Asia, and North America. It provided an opportunity for countries to share information and lessons learned in an open forum. The meeting was a great success.

In all, the 2007-2008 fiscal year was a very active year in which the TSB continued to increase its reach and stretch the envelope in its communications activities.

2.3 Marine Sector

2.3.1 Annual Statistics

In all, 453 marine accidents were reported to the TSB in 2007, a 4 per cent decrease from the 2006 total of 472 and a 9 per cent decrease from the 2002-2006 average of 497. Marine fatalities totalled 14 in 2007, down from the 2006 total of 18 and the 2002-2006 average of 22.

Shipping accidents, which comprised 87 per cent of marine accidents, reached a 30-year low of 393 in 2007, down from 422 in 2006 and from the five-year average of 447. 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 60 in 2007, a 20 per cent increase from the 2006 total of 50 and a 22 per cent increase from the five-year average of 49.

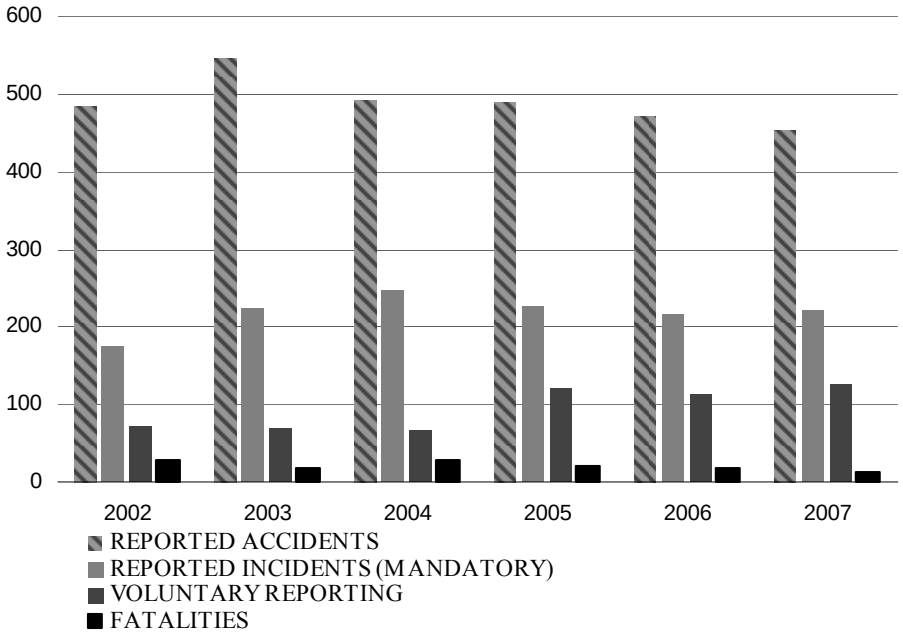
Marine activity for Canadian commercial non-fishing vessels over 15 gross tons (excluding passenger vessels and cruise ships) increased by 2 per cent from the 2002-2006 average, yielding a 3 per cent decrease in the accident rate to 3.3 accidents per 1000 movements from the five-year average of 3.4. Marine activity for foreign commercial non-fishing vessels increased by 2 per cent from the 2002-2006 average while the accident rate decreased by 6 per cent decrease to 1.5 accidents per 1000 movements, down from the five-year average of 1.6.

In 2007, shipping accidents resulted in 3 fatalities, down from 12 in 2006 and the five-year average of 15. Accidents aboard ship resulted in 11 fatalities, up 5 from the 2006 total and up 4 from the five-year average.

Twenty-eight vessels were reported lost in 2007, down from the 2006 total of 34 and the five-year average of 30.

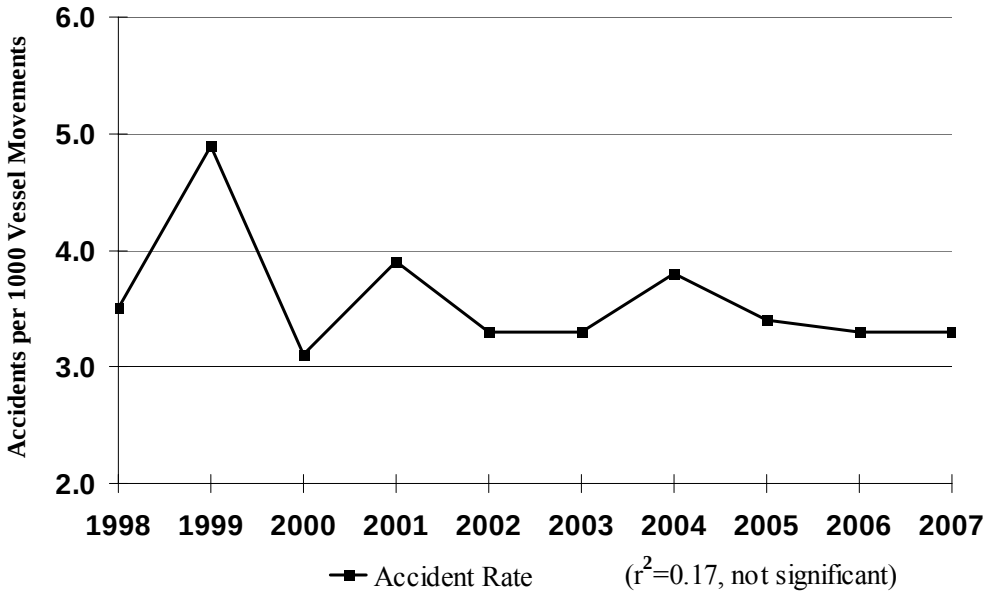
In 2007, 222 marine incidents were reported to the TSB in accordance with the mandatory reporting requirements. This represents a 3 per cent increase from the 2006 total of 216 and a 2 per cent increase from the five-year average of 218.

Figure 3: Marine Occurrences and Fatalities



One indicator of marine safety in Canada is the Canadian-flag shipping accident rate. The 2007 accident rate has remained the same as 2006 at 3.3 accidents per 1000 movements.

Figure 4: Canadian-Flag Shipping Accident Rates



2.3.2 Investigations

In 2007-2008, 6 marine investigations were started and 19 investigations were completed. The number of investigations completed more than doubled compared to last year. This is due to a reduction of new investigations started and concentration of the Marine Branch efforts on the significant report backlog. The average duration of completed investigations increased to 936 days compared to 801 days the year before. This increase is attributable to concentrated efforts to complete older investigations and focus on completion of the complex *Queen of the North* report, which was the largest marine investigation in TSB history.

Table 2: Marine Productivity

	2003-2004	2004-2005	2005-2006	2006-2007	2007-2008
Investigations Started	14 16		17	8	6
Investigations Completed	18	21	12 8 19		
Average Duration of Completed Investigations (Number of Days)	953	881	651 801	936	
Recommendations	7	4	6 0 3		
Safety Advisories	6	9	5	8	12
Safety Information Letters	11	8	8 8 4		
Note: Results can fluctuate significantly from year to year due to a number of factors such as staff turnover, the complexity of investigations and the investigation of major occurrences.					

2.3.3 Safety Actions Taken

Three marine safety recommendations were issued in 2007-2008.

In 2007-2008, there were no reassessments of responses to recommendations issued in previous years.

2.3.3.1 Marine Recommendations Issued in 2007-2008

Striking and Subsequent Sinking, Passenger and Vehicle Ferry *Queen of the North*, Gil Island, Wright Sound, British Columbia, 22 March 2006 **Report No. M06W0052**	
RECOMMENDATION	**M08-01** The Department of Transport, in conjunction with the Canadian Ferry Operators Association and the Canadian Coast Guard, develop, through a risk-based approach, a framework that ferry operators can use to develop effective passenger accounting for each vessel and route.
RESPONSE	Awaiting response
BOARD ASSESSMENT OF RESPONSE	To be reported next fiscal year
BOARD ASSESSMENT RATING	Pending

RECOMMENDATION	**M08-02** The Department of Transport establish criteria, including the requirement for realistic exercises, against which operators of passenger vessels can evaluate the preparedness of their crews to effectively manage passengers during an emergency.
RESPONSE	Awaiting response
BOARD ASSESSMENT OF RESPONSE	To be reported next fiscal year
BOARD ASSESSMENT RATING	Pending

RECOMMENDATION	**M08-03** The Department of Transport extend the requirement for the carriage of voyage data recorders/simplified voyage data recorders to large passenger vessels over 500 gross tonnage and all other commercial vessels on an equivalent basis to those trading internationally.
RESPONSE	Awaiting response
BOARD ASSESSMENT OF RESPONSE	To be reported next fiscal year
BOARD ASSESSMENT RATING	Pending

2.3.3.2 Assessment of Responses to Marine Recommendations Issued in 2006-2007

Because no marine recommendations were issued in 2006-2007, no assessment of responses was done this year.

2.3.3.3 Other Marine Safety Actions

With the coming into force of the *Canada Shipping Act, 2001*, on 01 July 2007, Transport Canada's new *Marine Personnel Regulations* took effect. Under the requirements of the Pleasure Craft Operator Card, compulsory training is required for operators of small commercial vessels supporting logging operations (TSB occurrence M07W0031).

A ship classification society issued a Memo to Surveyor for three sister ships to ensure that International Safety Management Code (ISM Code) audits verify that the master, senior officers and relevant crew members are familiar with the procedures for continually scrutinizing the vessel's side plating for cracks because these vessels may be prone to brittle fractures when operating in cold waters (TSB investigation report M02L0021).

The National Search and Rescue Secretariat, in conjunction with other agencies such as Transport Canada and the Canadian Coast Guard, sent out 10 000 reminders to vessel owners informing them of their responsibility to ensure that their emergency position indicating radio beacons (EPIRBs) are registered. A maintenance plan was also developed to ensure that the data collected in the Beacon Registry continue to be updated on a regular basis (TSB occurrence M07W0072).

Transport Canada issued Ship Safety Bulletin 06/2007 entitled *Information on Persons on Board, Counting, Recording, and Special Needs*. The bulletin recommends that passenger vessel owners and masters have readily available information on all persons on board that will be of assistance during emergency situations and search and rescue operations (TSB investigation report M06W0052).

Transport Canada issued Ship Safety Bulletin 07/2007 entitled *Inflatable Liferafts and Rescue Platforms, Stowage and Proper Access*. The bulletin urges owners and operators to stow liferafts in such a manner as to float free automatically if the vessel sinks. It also urges owners and operators that, even if liferafts are carried voluntarily, these should float free (TSB investigation report M05W0141).

BC Ferries developed a new Policy and Commitment to Employee Wellness and Substance Abuse. The policy includes a provision for mandatory testing for alcohol, drugs, and medications where "reasonable cause" exists. Information sessions regarding substance abuse were provided to northern route employees (TSB investigation report M06W0052).

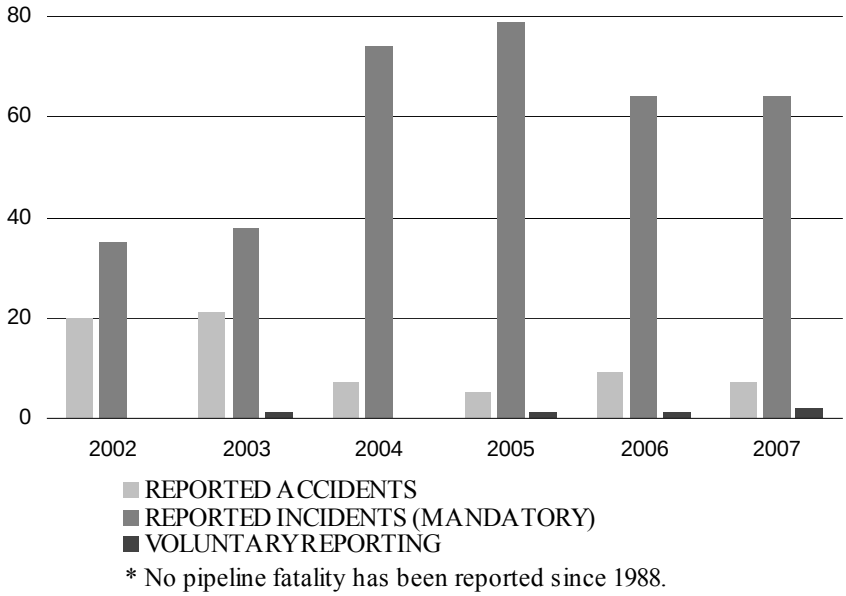
2.4 Pipeline Sector

2.4.1 Annual Statistics

In 2007, 7 pipeline accidents were reported to the TSB, down from the 2006 total of 9 and down from the 2002-2006 average of 12. Estimated pipeline activity was unchanged from the previous year. 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 2006.

In 2007, 64 pipeline incidents were reported to the TSB in accordance with the mandatory reporting requirements, unchanged from 64 in 2006 and up from the five-year average of 58. In all, 84 per cent of those incidents involved uncontained or uncontrolled release of small quantities of gas, oil and high-vapour-pressure products.

Figure 5: Pipeline Occurrences

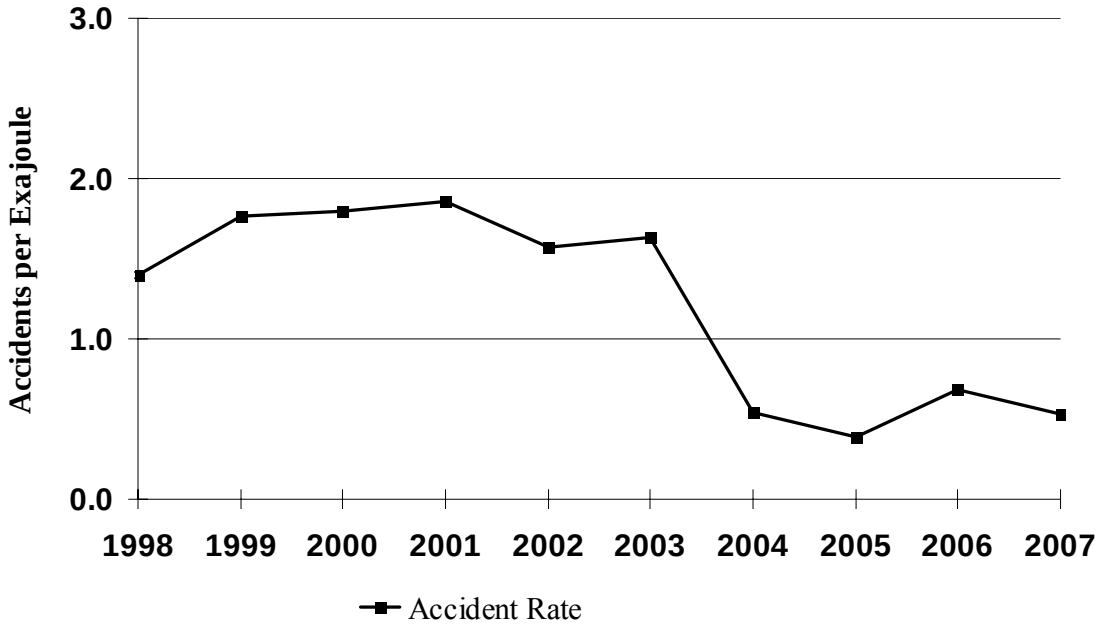


* No pipeline fatality has been reported since 1988.

One indicator of pipeline transportation safety in Canada is the pipeline accident rate.[4] This rate decreased to 0.5 pipeline accidents per exajoule in 2007, down from 0.7 in 2006 and down from the 2002-2006 average of 1.0.

[4] Pipeline accident rates after 2003 reflect the impact of clarifications to the pipeline industry of the TSB's accident and incident reporting requirements, and of internal adjustments to the data in TSB's Pipeline Occurrence Database.

Figure 6: Pipeline Accident Rates



2.4.2 Investigations

In 2007-2008, two pipeline investigations were started and two investigations were completed. The average duration of completed investigations has increased to 489 days, compared to 407 days in 2006-2007.

Table 3: Pipeline Productivity

	2003-2004	2004-2005	2005-2006	2006-2007	2007-2008
Investigations Started	0	0	2 1 2		
Investigations Completed	0	2	1 1 2		
Average Duration of Completed Investigations (Number of Days)	0	1081	922 407 489		
Recommendations	0	0	0 0 0		
Safety Advisories	0	0	0 0 0		
Safety Information Letters	0	0	0 1 0		
Note: Results can fluctuate significantly from year to year due to a number of factors such as staff turnover, the complexity of investigations and the investigation of major occurrences.					

2.4.3 Safety Actions Taken

No pipeline safety recommendations were issued in 2007-2008.

2.5 Rail Sector

2.5.1 Annual Statistics

A total of 1331 rail accidents were reported to the TSB in 2007, a 3 per cent decrease from the 2006 total of 1378 and a 4 per cent decrease from the 2002-2006 average of 1391. Estimated rail activity decreased by 3 per cent from 2006, but is comparable to the five-year average. The accident rate decreased to 14.3 accidents per million train-miles in 2007, compared to 14.4 in 2006 and the five-year rate of 15.2. Rail-related fatalities totalled 86 in 2007, compared to the 2006 total and five-year average of 95.

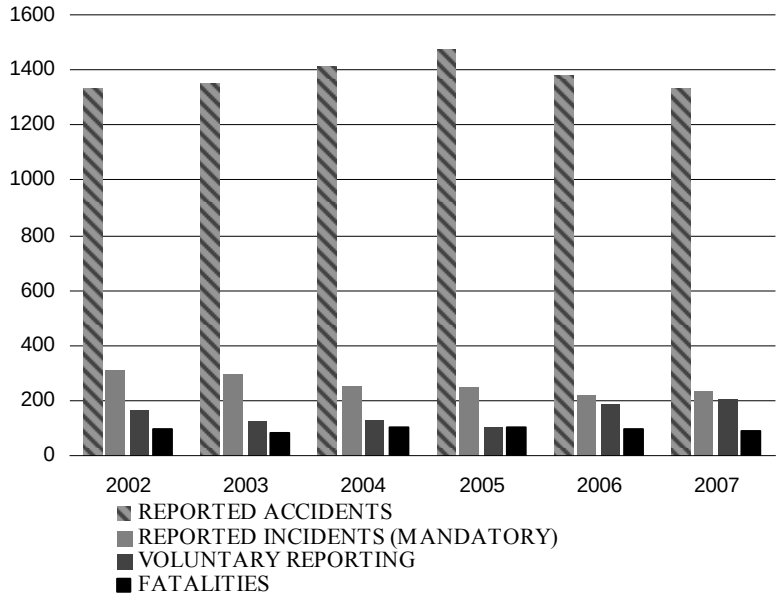
Eight main-track collisions occurred in 2007, compared to three in 2006 and the five-year average of six. In 2007, there were 161 main-track derailments, an increase of 14 per cent from the 2006 total of 141 and of 3 per cent from the five-year average of 156. Non-main-track derailments decreased to 639 in 2007 from 704 in 2006 and from the five-year average of 707.

In 2007, crossing accidents decreased to 218 from the 2006 total of 248 and from the five-year average of 254. Crossing-related fatalities numbered 27, down from 28 in 2006 and from the five-year average of 33. Trespasser accidents increased by 8 per cent to 99 in 2007 from 92 in 2006, and increased by 21 per cent over the five-year average of 82. With a total of 57 fatalities in 2007, trespasser accidents continued to account for the majority of rail fatalities.

In 2007, 192 rail accidents involved dangerous goods (this also includes crossing accidents in which the motor vehicle is carrying a dangerous good), up from 183 in 2006 but down from the five-year average of 210. Five of these accidents resulted in a release of product.

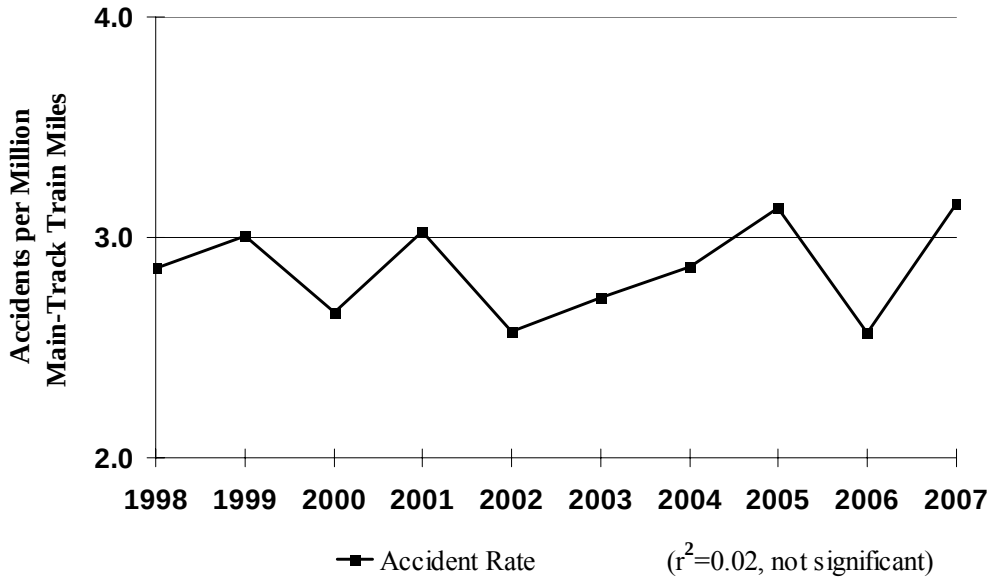
In 2007, rail incidents reported to the TSB in accordance with the mandatory reporting requirements totalled 233, up from 221 in 2006 but down from the five-year average of 265. Movements exceeding limits of authority incidents (113) comprised the largest proportion of the 233 reportable incidents. The second largest proportion was dangerous goods leaker incidents (90).

Figure 7: Rail Occurrences and Fatalities



One indicator of rail transportation safety in Canada is the main-track accident rate. This rate increased from 2.6 accidents per million main-track train-miles in 2006 to 3.2 in 2007.[5]

Figure 8: Main-Track Accident Rates



[5] Because accident statistics (derailments since 2001) have been adjusted in light of clarifications to industry of TSB's reporting requirements, historical rail accident rates after 2001 have been updated accordingly.

2.5.2 Investigations

A total of 11 rail investigations were started in 2007-2008 and 14 investigations were completed. The average duration of completed investigations increased to 697 days compared to 598 days the year before. This increase is attributable to concentrated efforts to complete older investigations.

Table 4: Rail Productivity

	2003-2004	2004-2005	2005-2006	2006-2007	2007-2008
Investigations Started	14 14		9	18	11
Investigations Completed	15 25		9	12	14
Average Duration of Completed Investigations (Number of Days)	894	618	519 598	697	
Recommendations	4	3	0 2 4		
Safety Advisories	7	6	9	8	16
Safety Information Letters	11 10		8	2	13
Note: Results can fluctuate significantly from year to year due to a number of factors such as staff turnover, the complexity of investigations and the investigation of major occurrences.					

2.5.3 Safety Actions Taken

Four rail safety recommendations were issued in 2007-2008.

The Rail Branch reassessed responses to 120 recommendations issued since 1991. With Board approval, 4 recommendations went from active to inactive status and 21 recommendations remained active. The Board's reassessments were communicated to the appropriate change agent(s) for information and action.

2.5.3.1 Rail Recommendations Issued in 2007-2008

Derailment, Canadian National Freight Train, Wabamun, Alberta, 03 August 2005 **Report No. R05E0059**	
RECOMMENDATION	**R07-01** The Department of Transport establish minimum standards for the quality and strength of maintenance rails.
RESPONSE	Transport Canada has included this as a project to be undertaken in order to establish standards and has also included it for consideration in modernizing the *Railway Track Safety Rules*.
BOARD ASSESSMENT OF RESPONSE	To be reported next fiscal year
BOARD ASSESSMENT RATING	Pending

RECOMMENDATION	**R07-02** The Department of Transport establish standards requiring that rails approaching their fatigue limit be replaced.
RESPONSE	Transport Canada has included this as a project to be undertaken in order to establish standards and has also included it for consideration in modernizing the *Railway Track Safety Rules*.
BOARD ASSESSMENT OF RESPONSE	To be reported next fiscal year
BOARD ASSESSMENT RATING	Pending

Main-Track Derailment, Canadian National Freight Train, Saint-Henri-de-Lévis, Quebec, 17 August 2004 Report No. R04Q0040	
RECOMMENDATION	**R07-03** The Department of Transport and the railway industry conduct in-depth studies on the behaviour of saturated organic materials under cyclic loading.
RESPONSE	Awaiting response
BOARD ASSESSMENT OF RESPONSE	To be reported next fiscal year
BOARD ASSESSMENT RATING	Pending

RECOMMENDATION	**R07-04** The Department of Transport extend the safety provisions of the construction standards applicable to 286 000-pound cars to all new non-pressurized tank cars carrying dangerous goods.
RESPONSE	Awaiting response
BOARD ASSESSMENT OF RESPONSE	To be reported next fiscal year
BOARD ASSESSMENT RATING	Pending

2.5.3.2 Assessment of Responses to Rail Recommendations Issued in 2006-2007

Main-Track Derailment, Canadian Pacific Railway Train, Whitby, Ontario, 14 January 2004 Report No. R04T0008	
RECOMMENDATION	**R06-01** The Department of Transport work with the Railway Association of Canada to implement rail traffic control protocols and training that will recognize periods of high workload and make safety paramount.
RESPONSE	Transport Canada agrees in principle with the intent of this recommendation and will work with the industry to examine periods of high rail traffic controller workload activity in the context of this recommendation and other regulatory initiatives.

Main-Track Derailment, Canadian Pacific Railway Train, Whitby, Ontario, 14 January 2004 Report No. R04T0008	
BOARD ASSESSMENT OF RESPONSE	On 23 August 2007, Transport Canada indicated that a qualified outside consultant was hired to conduct a study to examine rail traffic controller workload. On 31 October 2007, Transport Canada indicated that, upon recent review and discussion with the TSB of the specific requirements of the recommendation, it has determined that a comprehensive study is not warranted.
BOARD ASSESSMENT RATING	Unsatisfactory

Pedestrian Fatality, Canadian National Train, Brockville, Ontario, 17 February 2005 Report No. R05T0030	
RECOMMENDATION	**R06-02** The Department of Transport assess the risk to pedestrians at all multi-track main-line crossings, make its assessment public and implement a program, in conjunction with stakeholders, to mitigate the risk of second-train pedestrian accidents.
RESPONSE	Transport Canada disagrees with the recommendation and feels that it would not be safety productive to comply.
BOARD ASSESSMENT OF RESPONSE	Transport Canada has prioritized some high-risk crossings, and improvements are being made as resources permit. Transport Canada is drafting a Pedestrian Crossing Standard.
BOARD ASSESSMENT RATING	Satisfactory Intent

2.5.3.3 Other Rail Safety Actions

The United States Federal Railroad Administration and the North American railway industry signed a memorandum of cooperation in April 2007 to develop a better understanding of the factors contributing to high-pressure tank car safety and to enhance the effectiveness of railway-specific hazardous material bulk packaging under the project "Next Generation Tank Car" (TSB investigation report R04Q0040).

Canadian National (CN) issued instructions to keep heavy cars on the head end whenever possible based on the possibility that destination marshalling may increase the risk of undesirable track-train dynamics (TSB investigation report R05C0116). It also instituted

a complete restriction on the handling of certain maintenance-of-way equipment in trains after a derailment involving that equipment (TSB occurrence R07T0110), and issued a bulletin directing operators of remotely controlled trains to visually verify that the movement is responding in the required direction (TSB investigation report R07W0042).

Canadian Pacific Railway (CPR) revised its General Operating Instructions to prescribe certain improvements to marshalling of locomotives without coupler alignment control (TSB investigation report R05C0082). It also conducted a system-wide review to verify the safe condition of all derails, including correct size and proper securement of derails (TSB Rail Safety Information letters 13/07 and 16/07), and issued internal instructions to track maintenance forces that modifications to car equipment must first be approved by the car engineering group (TSB occurrence R07H0015).

CSX Transportation Inc. reduced the permissible speed to 10 mph on several portions of its Montréal Subdivision, and performed track rehabilitation from the United States border to Beauharnois, Quebec (TSB investigation report R07D0030).

VIA Rail Canada Inc. (VIA) and Goderich-Exeter Railway (GEXR) issued instructions for the use of cellular telephones in Occupancy Control System territory over the Guelph Subdivision (TSB investigation report R06H0013).

Transport Canada (TC) issued a Notice to CN concerning its rail inspection records as required by the *Railway Track Safety Rules*. CN subsequently incorporated data used for the verification check into the railway's rail flaw testing databases with the capability to be uploaded on a daily basis. TC also issued Notices and Orders to CN concerning train operations on the Squamish Subdivision in British Columbia relating to safety deficiencies in train operations on the former BC Rail line (TSB investigation report R05V0141).

TC issued a Notice to CN requiring that employees who operate trains be adequately instructed and trained in the procedures to be followed for the safe and proper operation of the equipment, and to be familiar with the territory (TSB Rail Safety Advisory 12/07).

TC also noted deficiencies in the *Railway Freight and Passenger Train Brake Rules* and, in consultation with an industry working group, is considering proposed amendments to address the inadequacies. TC is researching the issues of train length and train handling to develop safety guidelines or standards (TSB investigation report R05C0116).

TC reviewed work records of randomly selected VIA locomotive engineers within the Pacific Region to verify compliance with Rule 5.1.2 of the *Work/Rest Rules for Railway Operating Employees* (TSB Rail Safety Information letter 07/07).

It also reviewed the loading and unloading facilities of shipments of copper concentrate in open gondola cars arriving at the Vancouver Wharf, British Columbia (TSB Rail Safety Information letter 06/07).

Furthermore, TC reviewed the securement of rail cars being stored on siding tracks that had track gradient and frequent exposure to high winds on the Montmagny Subdivision (TSB Rail Safety Information letter 02/08).

2.6 Air Sector

2.6.1 Annual Statistics

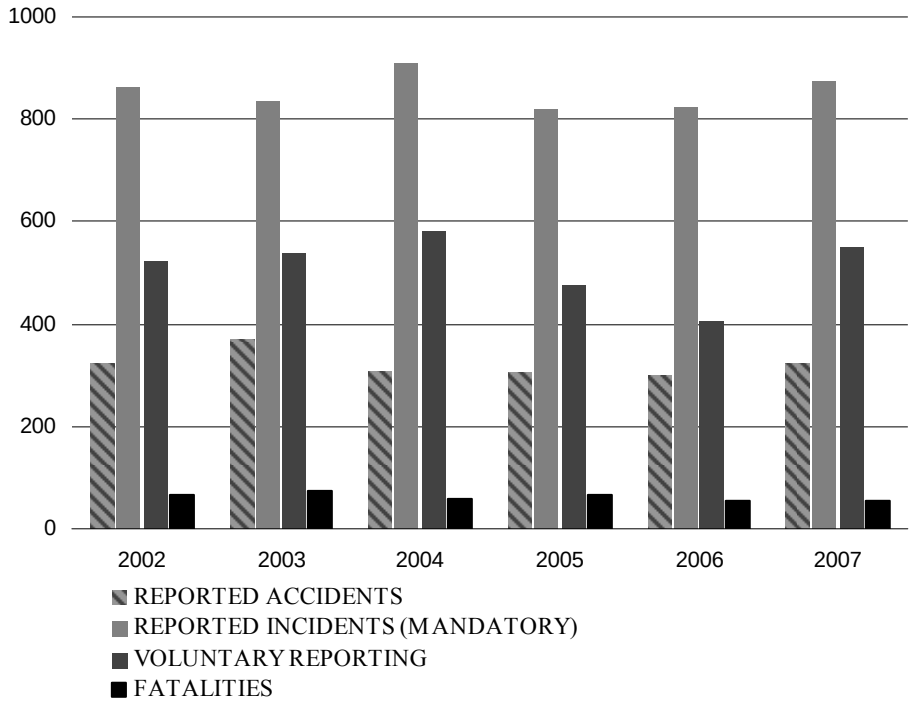
Canadian-registered aircraft, other than ultralights, were involved in 284 reported accidents in 2007, an 8 per cent increase from the 2006 total of 262 and a 6 per cent increase from the 2002-2006 average of 268. The estimate of flying activity for 2007 is 4 373 000 hours, yielding an accident rate of 6.5 accidents per 100 000 flying hours, up from the 2006 rate of 6.3 but down from the five-year rate of 6.7. Canadian-registered aircraft, other than ultralights, were involved in 33 fatal occurrences with 49 fatalities in 2007, comparable to the 31 fatal occurrences with 52 fatalities in 2006 and the five-year average of 30 fatal occurrences with 50 fatalities. A total of 12 fatal occurrences involved commercial aircraft (7 aeroplanes and 5 helicopters), and 14 of the remaining 21 fatal occurrences involved privately operated aeroplanes.

The number of accidents involving ultralights increased to 30 in 2007 from 28 in 2006, and the number of fatal accidents increased to 5 in 2007 from 1 in 2006.

The number of foreign-registered aircraft accidents in Canada decreased to 10 in 2007 from 14 in 2006. There were no fatal accidents in 2007, down from 2 in 2006.

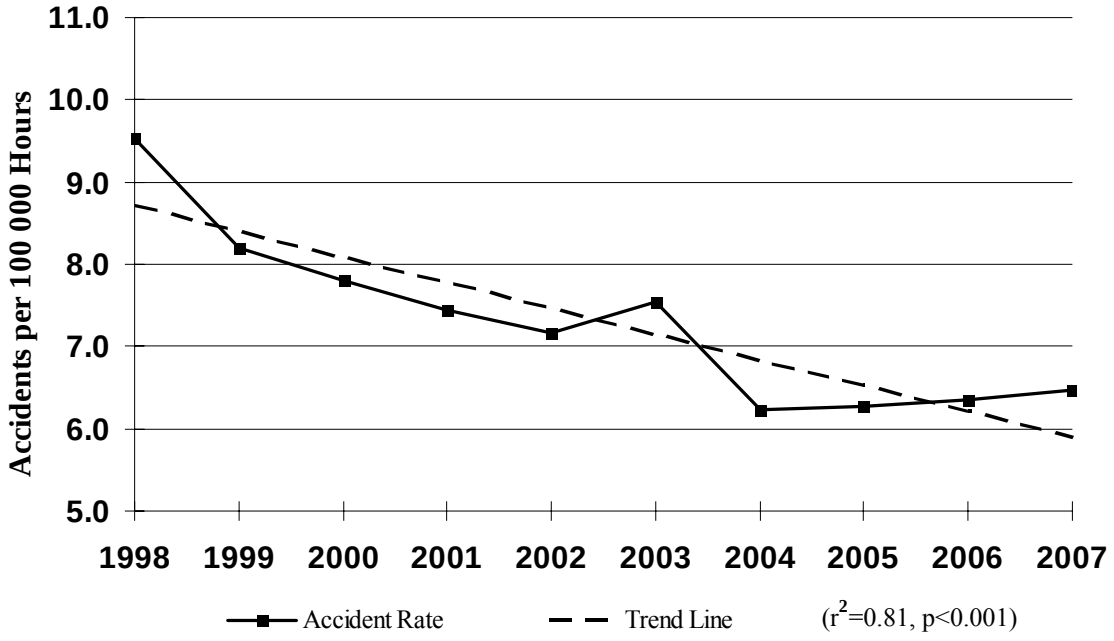
In 2007, a total of 874 incidents were reported to the TSB in accordance with the mandatory reporting requirements. This represents a 6 per cent increase from the 2006 total of 825 and a 3 per cent increase from the 2002-2006 average of 851.

Figure 9: Air Occurrences and Fatalities



One indicator of air transportation safety in Canada is the accident rate for Canadian-registered aircraft. In 2007, this rate increased to 6.5 accidents per 100 000 hours from the 2006 rate of 6.3, but remained below the five-year average of 6.7. The trend line shows a significant downward trend over the past 10 years.

Figure 10: Canadian-Registered Aircraft Accident Rates



2.6.2 Investigations

A total of 49 air investigations were started in 2007-2008 and 47 investigations were completed. This represents an increase in the number of investigations completed compared to the previous year (36). The average duration of completed investigations has decreased to 493 days, compared to 516 days the year before.

Table 5: Air Productivity

	2003-2004	2004-2005	2005-2006	2006-2007	2007-2008
Investigations Started	47	44	50 41 49		
Investigations Completed	40	67	53 36 47		
Average Duration of Completed Investigations (Number of Days)	485	524	404 516 493		
Recommendations 0		4	6	4	11
Safety Advisories	9	9	7	16	13
Safety Information Letters	8	6	5 12 9		
Note: Results can fluctuate significantly from year to year due to a number of factors such as staff turnover, the complexity of investigations and the investigation of major occurrences.					

2.6.3 Safety Actions Taken

Eleven air safety recommendations were issued in 2007-2008. Of that number, seven responses have been received to date and are being assessed by the staff.

The Air Branch reassessed responses to 39 recommendations issued in previous years. With Board approval, 5 recommendations went from active to inactive status. At the end of fiscal year 2007-2008, there were 43 active recommendations. The Board's reassessments were communicated to the appropriate change agent(s) for information and action.

2.6.3.1 Air Recommendations Issued in 2007-2008

Runway Overrun and Fire, Air France, Airbus A340-313, Toronto/Lester B. Pearson International Airport, Ontario, 02 August 2005 **Report No. A05H0002**	
RECOMMENDATION	**A07-01** The Department of Transport establish clear standards limiting approaches and landings in convective weather for all air transport operators at Canadian airports.
RESPONSE	Transport Canada's response was received and is being assessed.
BOARD ASSESSMENT OF RESPONSE	To be reported next fiscal year
BOARD ASSESSMENT RATING	Pending

RECOMMENDATION	**A07-02** France's Direction Générale de l'Aviation Civile and other civil aviation authorities establish clear standards limiting approaches and landings in convective weather.
RESPONSE	The Direction Générale de l'Aviation Civile's response was received and is being assessed.
BOARD ASSESSMENT OF RESPONSE	To be reported next fiscal year
BOARD ASSESSMENT RATING	Pending

Runway Overrun and Fire, Air France, Airbus A340-313, Toronto/Lester B. Pearson International Airport, Ontario, 02 August 2005 **Report No. A05H0002**	
RECOMMENDATION	**A07-03** The Department of Transport mandate training for all pilots involved in Canadian air transport operations to better enable them to make landing decisions in deteriorating weather.
RESPONSE	Transport Canada's response was received and is being assessed.
BOARD ASSESSMENT OF RESPONSE	To be reported next fiscal year
BOARD ASSESSMENT RATING	Pending

RECOMMENDATION	**A07-04** France's Direction Générale de l'Aviation Civile and other civil aviation authorities mandate training for air transport pilots to better enable them to make landing decisions in deteriorating weather.
RESPONSE	The Direction Générale de l'Aviation Civile's response was received and is being assessed.
BOARD ASSESSMENT OF RESPONSE	To be reported next fiscal year
BOARD ASSESSMENT RATING	Pending

RECOMMENDATION	**A07-05** The Department of Transport and other civil aviation authorities require crews to establish the margin of error between landing distance available and landing distance required before conducting an approach into deteriorating weather.
RESPONSE	Transport Canada's response was received and is being assessed.
BOARD ASSESSMENT OF RESPONSE	To be reported next fiscal year
BOARD ASSESSMENT RATING	Pending

Runway Overrun and Fire, Air France, Airbus A340-313, Toronto/Lester B. Pearson International Airport, Ontario, 02 August 2005 **Report No. A05H0002**	
RECOMMENDATION	**A07-06** The Department of Transport require all Code 4 runways to have a 300 m runway end safety area (RESA) or a means of stopping aircraft that provides an equivalent level of safety.
RESPONSE	Transport Canada's response was received and is being assessed.
BOARD ASSESSMENT OF RESPONSE	To be reported next fiscal year
BOARD ASSESSMENT RATING	Pending

RECOMMENDATION	**A07-07** The Department of Transport require that passenger safety briefings include clear direction to leave all carry-on baggage behind during an evacuation.
RESPONSE	Transport Canada's response was received and is being assessed.
BOARD ASSESSMENT OF RESPONSE	To be reported next fiscal year
BOARD ASSESSMENT RATING	Pending

Engine Power Loss – Forced Landing, Sonicblue Airways, Cessna 208B (Caravan), Port Alberni, British Columbia, 21 January 2006 **Report No. A06P0010**	
RECOMMENDATION	**A07-08** The Department of Transport take into account all propulsion system failures when assessing the safety of single-engine commercial operations.
RESPONSE	Awaiting response
BOARD ASSESSMENT OF RESPONSE	To be reported next fiscal year
BOARD ASSESSMENT RATING	Pending

Hydraulic Flight Control Malfunction, Vancouver Island Helicopters, Eurocopter AS 350 B2 (Helicopter), Kamarang, Guyana, 06 February 2005 **Report No. A05F0025**	
RECOMMENDATION	**A07-09** The European Aviation Safety Agency, in coordination with other involved regulatory authorities and industry, ensure that the AS 350 helicopter hydraulic cut-off (HYD CUT OFF) switch is capable of handling the inductive electrical load of the circuit.
RESPONSE	Awaiting response
BOARD ASSESSMENT OF RESPONSE	To be reported next fiscal year
BOARD ASSESSMENT RATING	Pending

Hard Landing – Fuel Leak and Fire, Sundance Balloons International, FireFly 12B Hot Air Balloon, Winnipeg, Manitoba, 11 August 2007 **Occurrence No. A07C0151**	
RECOMMENDATION	**A08-01** The Department of Transport ensure that passenger-carrying commercial balloon operations provide a level of safety equivalent to that established for other aircraft of equal passenger-carrying capacity.
RESPONSE	Awaiting response
BOARD ASSESSMENT OF RESPONSE	To be reported next fiscal year
BOARD ASSESSMENT RATING	Pending

RECOMMENDATION	**A08-02** The Department of Transport ensure that balloons carrying fare-paying passengers have an emergency fuel shut-off.
RESPONSE	Awaiting response
BOARD ASSESSMENT OF RESPONSE	To be reported next fiscal year
BOARD ASSESSMENT RATING	Pending

2.6.3.2 Assessment of Responses to Air Recommendations Issued in 2006-2007

Post-Impact Fires Resulting from Small-Aircraft Accidents, Safety Issues Investigation **Report No. SII A05-01**	
RECOMMENDATION	**A06-08** Transport Canada, together with the Federal Aviation Administration and other foreign regulators, revise the cost-benefit analysis for Notice of Proposed Rule Making 85-7A using Canadian post-impact fire statistics and current value of statistical life rates, and with consideration to the newest advances in post-impact fire prevention technology.
RESPONSE	In its 20 November 2006 response, Transport Canada (TC) did not make reference to the deficiency described in Recommendation A06-08. In its response dated 29 January 2007, TC states that it does not select the value of statistical life (VSL) but merely uses a VSL established by Treasury Board Secretariat (TBS) for use in its regulatory-related cost-benefit analysis. TC has contacted TBS to discuss Recommendation A06-08, and TBS staff has expressed interest in reviewing the VSL. TC states that it is interested in participating in a TBS–led interdepartmental review of the VSL. TC's response suggests that the TSB may wish to participate in such a review of VSL rates and calculation methodology. Additionally, TC states that, because the VSL is not solely an aviation issue, it would be inappropriate to approach the Federal Aviation Administration (FAA) regarding changes to the VSL. TC advises that the FAA is aware of TSB's report SII A05-01 and that TC is in regular contact with the FAA and will relay any information regarding FAA's intentions to the TSB.

Post-Impact Fires Resulting from Small-Aircraft Accidents, Safety Issues Investigation **Report No. SII A05-01**	
BOARD ASSESSMENT OF RESPONSE	As TC's response dated 20 November 2006 contained no action or proposed action that would reduce or eliminate the risks associated with this deficiency, TSB staff sought an update of TC's position to Recommendation A06-08. TC's updated response does not indicate TC's position with respect to the core of Recommendation A06-08; that the cost-benefit analysis used in FAA's Notice of Proposed Rule Making 85-7A be revised in accordance with suggested criteria. Instead, it focuses on the issues related to a single criterion: the current VSL rates. Additionally, there is no mention of revising the cost-benefit analysis in light of the benefits of the Canadian post-impact fire statistics or in consideration of the newest advances in post-impact fire-prevention technology. As far as working with foreign regulators, TC indicates that it will not take any extraordinary measures in its dealings with the FAA to advance the merits of Recommendation A06-08 and makes no mention of contacting other foreign regulators. Essentially, TC's action plan is limited to working with TBS to review the VSL.
BOARD ASSESSMENT RATING	Satisfactory in Part

RECOMMENDATION	**A06-09** To reduce the number of post-impact fires in impact-survivable accidents involving new production aeroplanes weighing less than 5700 kg, Transport Canada, the Federal Aviation Administration, and other foreign regulators include in new aeroplane type design standards: - methods to reduce the risk of hot items becoming ignition sources; - technology designed to inert the battery and electrical systems at impact to eliminate high-temperature electrical arcing as a potential ignition source;

	- requirements for protective or sacrificial insulating materials in locations that are vulnerable to friction heating and sparking during accidents to eliminate friction sparking as a potential ignition source; - requirements for fuel system crashworthiness; - requirements for fuel tanks to be located as far as possible from the occupied areas of the aircraft and for fuel lines to be routed outside the occupied areas of the aircraft to increase the distance between the occupants and the fuel; and - improved standards for exits, restraint systems, and seats to enhance survivability and opportunities for occupant escape.
RESPONSE	TC's response dated 20 November 2006 makes a general statement that many amendments to Airworthiness Manual (AWM) 523/FAR 23 regulations have been adopted and may address certain elements of Recommendation A06-09. Furthermore, it states that many of the aircraft identified in the TSB report were certified to earlier design standards and would not have benefited from subsequent regulatory changes. Additionally, TC's response expresses support for the intent of this recommendation but concludes by declaring that TC is not in a position to commit the necessary resources at this time. TC's updated response dated 29 January 2007 declares that TC still holds the fundamental position outlined in the Minister's response. It restates that there have been many amendments to AWM 523/FAR 23 regulations and that current standards are more stringent than those that prevailed during the time when the aircraft cited in report SII A05-01 were built. The response goes on to explain that elements of Recommendation A06-09 will be taken into consideration as the regulator performs due diligence on any proposed regulatory change. The remainder of the response explains the certification process and how proposed modifications to an aircraft or component are evaluated against the standards in force at the time of certification.

Post-Impact Fires Resulting from Small-Aircraft Accidents, Safety Issues Investigation **Report No. SII A05-01**	
BOARD ASSESSMENT OF RESPONSE	TC's 20 November 2006 response implies but does not state which amendments to AWM 523/FAR 23 have addressed elements of Recommendation A06-09. Additionally, the response does not provide any insight into TC's assessment of the merits of amending new aeroplane type design standards as suggested in Recommendation A06-09. Furthermore, it is not clear why TC's response focuses on existing certificated aircraft rather than addressing the need to reduce the number of post-impact fires in impact-survivable accidents by amending new aeroplane type design standards as Recommendation A06-09 suggests. The updated response dated 29 January 2007 is a clarification of TC's position as originally stated in the Minister's response dated 20 November 2006. As in the original response, a general reference is made to AWM 523/FAR 23 amendments but no specifics are provided as to whether or not these amendments address the deficiencies to the aeroplane type design standards as identified in Recommendation A06-09. Additionally, although TC indicates that it will consider the "safety concerns" identified in Recommendation A06-09, as the standards evolve, no definitive action plan to cause a review of the aeroplane type design standards is provided. In summary, the status quo is maintained because TC states that it still holds the fundamental position outlined in the Minister's response dated 20 November 2006.
BOARD ASSESSMENT RATING	Unsatisfactory

Post-Impact Fires Resulting from Small-Aircraft Accidents, Safety Issues Investigation **Report No. SII A05-01**	
RECOMMENDATION	**A06-10** To reduce the number of post-impact fires in impact-survivable accidents involving existing production aircraft weighing less than 5700 kg, Transport Canada, the Federal Aviation Administration, and other foreign regulators conduct risk assessments to determine the feasibility of retrofitting aircraft with the following: - selected technology to eliminate hot items as a potential ignition source; - technology designed to inert the battery and electrical systems at impact to eliminate high-temperature electrical arcing as a potential ignition source; - protective or sacrificial insulating materials in locations that are vulnerable to friction heating and sparking during accidents to eliminate friction sparking as a potential ignition source; and - selected fuel system crashworthiness components that retain fuel.
RESPONSE	TC's response dated 20 November 2006 states that it is not aware of any aviation industry initiatives to retrofit production aircraft in the manner suggested in Recommendation A06-10. Furthermore, TC states that, until such technology is available, viable and required, it cannot conduct a risk assessment or mandate a retrofit to production aircraft. It concludes by stating that a study would be required to clearly identify the benefit of such an undertaking. The final paragraph of the response states that the Department is not in a position to commit the necessary resources at this time. In its second response dated 29 January 2007, TC states that it would be inappropriate for TC to mandate changes to current production aircraft as suggested in Recommendation A06-10. TC indicates that it will review design proposals from industry in light of TSB's recommendations to assure that such modifications meet the highest standards possible.

Post-Impact Fires Resulting from Small-Aircraft Accidents, Safety Issues Investigation Report No. SII A05-01	
BOARD ASSESSMENT OF RESPONSE	TC's initial response dated 20 November 2006 states that TC cannot conduct a risk assessment to determine the feasibility of retrofitting aircraft, as suggested in Recommendation A06-10, because a study must first be undertaken to establish that pertinent technologies are available, viable and required. No action plan to conduct such a study is provided in TC's response. TC's follow-up response dated 29 January 2007 states that mandating changes to current production aircraft as suggested in Recommendation A06-10 would be inappropriate. This statement is incongruous as Recommendation A06-10 makes no mention of mandating changes but rather suggests that risk assessments be conducted. In lieu of any TC initiative to conduct risk assessments, TC would react to technology proposals from industry to ensure that such modifications meet the highest standards.
BOARD ASSESSMENT RATING	Unsatisfactory

2.6.3.3 Other Air Safety Actions

As a result of investigation A05A0161 in which a commercial airliner experienced wing tip scrape during a low-visibility approach, aviation regulations have been amended to prohibit commercial aeroplane operators from beginning an approach when visibility is so poor that a successful approach to a landing is unlikely. Termed "Approach Ban," the amended regulations establish, for all runways where visibility is reported, the minimum visibility for the crew to begin an approach.

Following a loss of separation investigation (A05C0153) near Hall Beach, Nunavut, Transport Canada (TC) issued an amendment to Section RAC 12.7.1.3 of the *Aeronautical Information Manual* requiring that pilots use published latitude and longitude coordinates when making position reports when compulsory reporting points have not been named. As well, on 27 June 2006, the Edmonton Area Control Centre issued a directive to the North High and Shield specialties that included a requirement that the controller activating the northern airspace display system (NADS) flight plan verify the fix field against the flight plan route to ensure an accurate setup. Since the occurrence, direct controller–pilot communications have been enhanced in the North High and Shield specialties with the establishment of 12 new communications frequencies, and the upgrade of two frequencies to long-range frequencies.

Based on the initial information uncovered during TSB investigation A05F0047 concerning the loss of the rudder on an Airbus A310, on 17 March 2005, Airbus issued an All Operators Telex for the inspection of all aircraft equipped with part number A55471500 series rudders. This one-time visual and tap-test inspection involved 222 Airbus A310s, 146 Airbus A300-600s, 6 Airbus A330s, and 34 Airbus A340s, for a total of 408 aircraft. In addition, a more detailed inspection of rudder side panels on over 20 aircraft was conducted using the elasticity laminate checker (ELCH) test method.

On 08 September 2006, following the investigation (A05P0298) into a fatal crash involving an engine failure on a Mitsubishi MU-2B, TC issued Service Difficulty Advisory (SDA) AV-2006-07 regarding Mitsubishi MU-2B cracked combustor plenums (Honeywell TPE-331-6-252M engines). The SDA recommended compliance with the manufacturer's (Honeywell) service bulletin (SB) TPE-331-72-2023 to change the combustion chamber from a 3102613-1 (multi-casting boss plenum) to a 3102613-2 (single-casting boss plenum). TC also recommended that maintenance personnel be extra attentive to boss welds when inspecting TPE-331 series engines for plenum cracks.

Following an investigation (A06W0104) into the loss of control and collision with terrain of a Bell 206B helicopter, the Alberta Forest Protection Branch advised that a list of remedial actions had been implemented to monitor passenger and equipment loads to prevent overloading of helicopters. A process to provide pilots with accurate firefighter crew and gear weights may help to ensure that helicopters involved in firefighting activities in Alberta are flown within prescribed weight and balance limits. As well, aviation audits were conducted at three of the four major Mountain Pine Beetle controls within Alberta, and the issue of providing accurate weights was reviewed and stressed at a training course for Type 1 and Type 1F initial attack leaders.

Pursuant to Aviation Safety Advisory A07W0099-D1-A1, TC indicated that the content of the advisory would be printed in TC's Aviation Safety Letter, Issue 2/2008, to inform industry of the significance of load shifting on aircraft performance and the need to effectively secure cargo in order to reduce the risk of in-flight load shift.

On 21 November 2006, a Bombardier CL-600-2B19 aircraft experienced a low fuel emergency as a result of a missed approach at the destination airport and then had to fly to a diversion airport with flaps fully extended as a result of flap failure. Following the receipt of Aviation Safety Advisory A06Q0188-D2-A1 and a related Board concern from the TSB, TC contacted Bombardier. Bombardier committed to draft an All Operators Message (AOM) to alert all operators of the incident and of the possible impact of flap system failure on fuel management. Following the same occurrence, TC and Bombardier Aerospace initiated a review of the existing Certification Maintenance Requirements (CMRs) for the CRJ flap system to identify short- and long-term actions to improve CRJ flap system reliability.

Aviation Safety Advisory A06P0010-D1-A1 apprised TC of a safety deficiency involving pilot training in the handling of engine failures during single-engine instrument flight rules (SEIFR) flight. In response, TC advised that TC's Civil Aviation Standards Branch

would prepare and issue a paper with the recommendation that air operators review their company training programs to ensure that SEIFR pilots receive practical training on engine failure procedures in instrument meteorological conditions (IMC) specific to the air operation and geographic location.

On 06 February 2007, the TSB issued occurrence bulletin (OB) A06P0190-1 to TC providing a factual description of the failure mode of the Bell 206B pylon support spindle. On 27 February 2007, TC issued Airworthiness Directive (AD) CF-2007-02, which mandated removal of all Bell 206B pylon support spindles that had been repaired by Cadorath Aerospace Inc. and mandated that maintenance records be annotated accordingly. On 09 March 2007, Bell Helicopter Textron Inc. (BHTI) issued Operational Safety Notice (OSN) 206-99-35 Revision B. This document is a revision of the previous version (Revision A) and reinforces BHTI's opposition to dimensional restoration repairs of Bell 206B pylon support spindles.

Appendix A – Reports Released by the TSB in 2007-2008 by Sector

Marine Reports Released in 2007-2008

DATE	LOCATION	VESSEL(S)	TYPE	EVENT	REPORT NO.
2004.02.26 Q	ueen Charlotte Sound, B.C.	*Hope Bay*	Small fishing	Capsizing and loss of life	M04W0034
2004.07.10	St. Clair River, Michigan, United States	*Evans McKeil* *Ocean Hauler*	Tug Barge	Striking of private docks and a pleasure craft	M04F0016
2004.07.24 Sain	te-Anne-de-Sorel, Que.	*Horizon*	Container Gr	ounding	M04L0092
2004.07.27 A	lexandria Bay, New York, United States	*KTC 115* *Salvor*	Tank barge Tug	Grounding M0	4F0017
2004.08.14 A	dolphus Reach, Lake Ontario, Ont.	*Sheddey-O* *Elmer H*	Pleasure craft Workboat	Collision M0	4C0043
2004.08.15 St.	Lawrence Seaway, Ont.	*Federal Maas*	Bulk carrier	Striking of St. Lawrence Seaway Bridge 12	M04C0037
2004.09.11 Low	er Detroit River, Ont.	*Karen Andrie* *A-397*	Tug Barge	Striking M	04C0044
2004.10.29 Tah	sish Inlet, Kyuquot Sound, B.C.	*Prospect Point*	Fishing Cap	sizing	M04W0225
2004.11.06	Strait of Georgia, B.C.	*Manson* *McKenzie* *M.B.D. 32*	Tug Crane barge Deck barge	Sinking and loss of life	M04W0235
2004.12.10 Payette	Island, Southeast Georgian Bay, Ont.	*59E22354*	Workboat C	apsizing	M04C0090
2005.05.14 Elah	o River, Squamish, B.C.	No name	Inflatable river raft	Capsizing M0	5W0080
2005.06.03 Sw	anson Channel, B.C.	*Sandra Carol* *Ocean Warrior* *Warrior* *Barge 216*	Fishing Tug Barge Barge	Collision M0	5W0087
2005.06.08 K	elowna, B.C.	*Quintana Roo*	Pleasure Capsizing	and loss of life	M05W0090
2005.06.30 H	orseshoe Bay, B.C.	*Queen of Oak Bay*	Roll-on/roll-off ferry	Loss of propulsion, subsequent striking of berthed pleasure craft and grounding	M05W0111

DATE	LOCATION	VESSEL(S)	TYPE	EVENT	REPORT NO.
2005.07.26 W	est of Cape Flaterry, Washington, United States	*Ocean Tor*	Fishing Cap	sizing and sinking with loss of life	M05W0141
2005.09.12 Bo	navista, N.L., 70 nm E	*Melina & Keith II*	Small fishing	Capsizing and loss of life	M05N0072
2005.09.12 O	ff Île d'Orléans, Que.	*Maria Desgagnés* *El Tio*	Tanker Sail	Collision M0	5L0192
2006.01.04 G	aspé, Que.	*Skalva*	General cargo	Fire	M06L0004
2006.03.22 G	il Island, Wright Sound, B.C.	*Queen of the North*	Passenger and vehicle ferry	Striking and subsequent sinking	M06W0052

Pipeline Reports Released in 2007-2008

DATE	LOCATION	COMPANY	EVENT	REPORT NO.
2005.07.15 N	ear Abbotsford, B.C.	Terasen Pipelines (Trans Mountain) Inc.	Crude oil pipeline rupture	P05H0044
2006.11.23 N	ear Cromer, Man.	Enbridge Pipelines (Westspur) Inc.	In-line tool occurrence	P06H0061

Rail Reports Released in 2007-2008

DATE	LOCATION	COMPANY	EVENT	REPORT NO.
2004.08.17 Sain	t-Henri-de-Lévis, Que.	Canadian National	Main-track derailment	R04Q0040
2005.01.31 MacKay,	Alta.	VIA Rail Canada Inc.	Crossing accident	R05E0008
2005.02.09 Ed	monton, Alta.	Canadian Pacific Railway	Rolling stock damage	R05C0049
2005.05.27 N	ear Bowden, Alta.	Canadian Pacific Railway	Main-track derailment	R05C0082
2005.07.13	Sarcee Yard, Calgary, Alta.	Canadian National	Derailment and collision	R05C0116
2005.07.31 Val	-d'Or, Que.	Canadian National	Main-track derailment	R05Q0033
2005.08.03 Wabam	un, Alta.	Canadian National	Derailment	R05E0059
2005.08.05 G	aribaldi, B.C.	Canadian National	Derailment	R05V0141
2005.08.22	Monet, Que.	VIA Rail Canada Inc.	Crossing collision	R05Q0040
2006.05.22 N	ear Swift Current, Sask.	Canadian Pacific Railway	Derailment R0	6W0079
2006.06.04	Charette, Que.	Canadian National	Main-track derailment	R06Q0054
2006.06.06 N	ew Hamburg, Ont.	Goderich-Exeter Railway Company and VIA Rail Canada Inc.	Risk of collision	R06H0013

DATE	LOCATION	COMPANY	EVENT	REPORT NO.
2006.07.14 M	imico, Ont.	Canadian National	Main-track derailment	R06T0153
2007.03.29 H	untingdon, Que.	Canadian National	Main-track derailment	R07D0030

Air Reports Released in 2007-2008

DATE	LOCATION	AIRCRAFT	EVENT	REPORT NO.
2005.02.06	Kamarang, Guyana	Eurocopter AS 350 B2 (helicopter)	Hydraulic flight control malfunction	A05F0025
2005.03.06 Mia	mi, Florida, United States, 90 nm S	Airbus A310-308	Loss of rudder in flight	A05F0047
2005.06.09	Hamilton, Ont.	Cessna TU206G	Aircraft control difficulty	A05O0120
2005.07.16 So	litude Lake, Que.	Bell 205 A-1 (helicopter)	Collision with water	A05Q0119
2005.08.02 To	ronto/Lester B. Pearson International Airport, Ont.	Airbus A340-313	Runway overrun and fire	A05H0002
2005.08.09	Hall Beach, Nunavut, 135 nm NW	Boeing 747-400 Airbus A340-500	Loss of separation	A05C0153
2005.09.17	Duncan, B.C.	Enstrom 280C (helicopter)	Engine power loss leading to loss of control	A05P0227
2005.09.28 Tu	mbler Ridge, B.C., 21 nm SE	Bell 205 A-1 (helicopter)	Power loss – mechanical malfunction	A05W0205
2005.10.30 Calg	ary International Airport, Alta.	Boeing 737-900	Engine torching	A05W0222
2005.11.05 Sain	t-Honoré-de-Beauce, Que.	Cessna 172M	Tree impact without loss of control	A05Q0208
2005.12.20	Terrace, B.C.	Mitsubishi MU-2B-36	Engine failure – descent into terrain	A05P0298
2005.12.25 H	alifax International Airport, N.S.	Boeing 737-700	Wing contact with runway during landing	A05A0161
2006.01.05 N	orman Wells, N.W.T.	Douglas C-54G-DC (DC-4)	In-flight engine fire	A06W0002
2006.01.21	Port Alberni, B.C., 11 nm SSE	Cessna 208B (Caravan)	Engine power loss – forced landing	A06P0010
2006.01.30 Las	Vegas, Nevada, United States	Airbus A319-114	Misaligned take-off	A06F0014
2006.03.21	Zama Lake, Alta, 25 nm NW	McDonnell Douglas MD600N	Airframe failure and collision with terrain	A06W0041

DATE	LOCATION	AIRCRAFT	EVENT	REPORT NO.
2006.05.01	Toronto, Ont.	Airbus A300 B4-203	In-flight separation of flap tab	A06O0104
2006.05.14	La Ronge, Sask.	Convair 580A air tanker	Loss of control on go-around (rejected landing)	A06C0062
2006.05.18 Pem	berton, B.C., 8 nm NE	Cessna T207A	Collision with terrain	A06P0087
2006.05.31 Pr	ince George Airport, B.C.	Cessna 185B	Loss of control	A06P0095
2006.06.07 La	Tuque, Que., 26 nm NE	Bell 206L-3 (helicopter)	Engine failure	A06Q0091
2006.06.16 O	ttawa/Carp Airport, Ont.	Bede BD5-J	Loss of control and collision with terrain	A06O0141
2006.06.21 Sm	ooth Rock Falls, Ont.	Bell B206L (helicopter)	Engine failure – collision with terrain	A06O0150
2006.07.03 N	ose Mountain Tower, Alta.	Bell 206B (helicopter)	Loss of control and collision with terrain	A06W0104
2006.07.04	Wabasca, Alta.	Bell 206B (helicopter)	Dynamic rollover	A06W0106
2006.07.08	Pasteur Lake, Que.	Cessna U206F (floatplane)	Loss of control and collision with terrain	A06Q0114
2006.07.11 Ed	son, Alta.	Piper PA-34-200T (Seneca II)	Loss of control – collision with ground	A06W0111
2006.07.16 W	ilcox Lake, Richmond Hill, Ont.	Cessna 172M	Collision with water	A06O0180
2006.08.07 Mo	unt Downton, B.C.	Cessna A185F	Collision with terrain	A06P0157
2006.08.13 D	avy Lake, Sask., 20 nm E	McDonnell Douglas Hughes 369E (helicopter)	Collision with water	A06C0131
2006.08.16	Fort Good Hope, N.W.T., 23 nm E	Cessna 337C Skymaster	Loss of control and collision with terrain	A06W0139
2006.09.04	Melancthon, Ont.	Pitts S1S (amateur-built)	Collision with terrain	A06O0231
2006.09.10	Montréal, Que.	Cessna 172M	Engine failure	A06Q0157
2006.09.17 Plaster	Rock, N.B., 8 nm E	VariViggen (amateur-built/experimental)	Collision with terrain	A06A0092
2006.09.19	Alice Arm, B.C.	Bell 206B (helicopter)	Loss of control – transmission pylon support spindle fracture	A06P0190
2006.09.24 St	ony Rapids, Sask., 22 nm SW	Bell 204B (helicopter)	Loss of control – in-flight breakup	A06C0154
2006.10.18 Mo	ntréal/St-Hubert Airport, Que.	Beechcraft King Air 100	Loss of electrical power	A06Q0180
2006.10.19	Caron Lake, Que.	Cessna U206F (floatplane)	Flight in weather conditions unfavourable for visual flight and collision with terrain	A06Q0181

DATE	LOCATION	AIRCRAFT	EVENT	REPORT NO.
2006.11.06	Goose Bay, N.L.	de Havilland DHC-6 Twin Otter	Collision with obstacle during take-off	A06A0114
2006.11.08 N	orway House, Man.	Swearingen Aircraft Corporation SA226-TC	Departure from runway surface	A06C0181
2006.11.21	Fort St. John, B.C.	Bombardier CL-600-2B19	Low fuel emergency	A06Q0188
2006.11.26 Mo	ntréal/Pierre Elliott Trudeau International Airport, Que.	Learjet 35A	Runway overrun	A06Q0190
2006.12.13	Regina, Sask.	Boeing 727-227	Cargo door opening on take-off	A06C0204
2007.01.03 Y	ellowknife, N.W.T.	Cessna A185F	Loss of control – marginal weather	A07W0003
2007.01.09	Fort St. John, B.C.	British Aerospace Jetstream 3112	Landing short of runway	A07W0005
2007.05.17	Miller Lake, Ont.	Cessna 180	Loss of control – collision with terrain	A07C0082
2007.06.02 Mayo	, Y.T.	de Havilland DHC-3T	Load shift/loss of control on take-off	A07W0099

Appendix B – 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 the government
Safety Information Letter	a letter that communicates safety-related information, often concerning local safety hazards, to government and corporate officials