STRONGER TIES:
A SHARED COMMITMENT TO RAILWAY SAFETY

Review of the Railway Safety Act
November 2007

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TO THE HONOURABLE
MINISTER OF TRANSPORT, INFRASTRUCTURE AND COMMUNITIES

Dear Minister:

We, the Members of the Advisory Panel for the *Railway Safety Act* Review, have the honour to submit to you our Report.

Respectfully submitted,

The Honourable Doug Lewis
Chair

Pierre-André Côté
Member

Martin Lacombe
Member

Gary Moser
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Canada

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CHAPTER 1
INTRODUCTION

The *Railway Safety Act* (RSA) was implemented in 1989, during a period of profound transformation for rail transportation in Canada – one of industry privatization and restructuring, as well as government deregulation.

The 1989 Act reflected that policy of deregulation, introduced as "Freedom to Move" in 1985. The policy shift separated economic and safety legislation and removed impediments to structural change of the railway industry. The flexibility afforded by this change led national railways to restructure by closing lines and transferring thousands of kilometres of track to short line operators.

During the 1990s, both Canadian National Railway (CN) and Canadian Pacific Railway (CP) were transformed as they sought operating efficiencies and enhanced profitability. In 1995, CN, which had been a Crown corporation, was privatized. Approximately 10,000 kilometres of rail lines were discontinued between 1990 and 2006, most divided fairly equally between CN and CP.

Today, CN and CP are profitable entities and operate about 74 per cent of Canada's rail network, compared with 90 per cent in the 1990s. There are now some 40 short line railways operating over about 16,000 kilometres of track.[1] VIA Rail continues to dominate the rail passenger sector, accounting for 95 per cent of intercity rail passengers, as well as providing targeted tourist excursions. Commuter rail services in urban areas have also increased substantially in recent years. Tourist and recreational railways offer popular services in many parts of Canada.

Rail traffic has also grown rapidly between Canada and the United States over the past 20 years. In the past decade, growth in freight carried by rail has outpaced general economic growth. This growth is expected to continue. More recently, with rapid economic expansion in Asia, the industry has undergone significant growth in traffic through Canadian west coast ports, especially containers.[2]

The *Railway Safety Act* was developed in the spirit of cooperation between industry and government and reflected a move away from a fully prescriptive regulatory approach to one that recognized the responsibility of railway companies for the safety of their own operations. Transport Canada retained overall responsibility for a safe, national transportation system.

[1] Railway Association of Canada, *Railway Safety Act Review: RAC Submission to Panel* (February 2007), page 4.

[2] Figures and information on the changing railway industry are derived from the Railway Association of Canada, *2007 Railway Trends* (October 2007), and Transport Canada, *Transportation in Canada 2006, Annual Report* (May 2007).

Following the mandated review of the Act in 1994 and subsequent amendments in 1999, regulatory changes were effected that required a railway to implement a safety management system (SMS). This led to new roles for the industry and the regulator – for railway companies, one of developing and implementing SMS and, for the regulator, one of performance-based auditing of a company's safety management system, rather than detailed technical inspections of the individual components of a company's operations.

The SMS approach is neither deregulation nor industry self-regulation. Rather, its success depends on a partnering between industry and the regulator to better manage risks inherent in the transportation system and to continuously improve safety performance. It represents an important change from "the way things used to be done" and continues to affect the railway industry and the regulator.

1.1 RATIONALE FOR THE 2006 RAILWAY SAFETY ACT REVIEW

Following these regulatory and industry changes, Canada enjoyed several years in the late 1990s during which the number of railway accidents declined. However, between 2002 and 2005, the number of railway accidents (excluding crossing and trespassing accidents) sharply increased.[3] Several accidents that occurred during this time, and even more recently, were dramatic – notably those in British Columbia, Alberta and Quebec. Collectively, they resulted in serious injuries and fatalities, significant environmental damage and negative economic impacts.

In December 2006, the Minister of Transport, Infrastructure and Communities initiated the *Railway Safety Act* Review. The impetus for the Review was provided by the need to address concerns raised by these high-profile railway accidents and to determine where safety improvements could be made. The Review was aimed at identifying gaps in the *Railway Safety Act,* and making recommendations to strengthen the regulatory regime to meet the changing nature of the railway industry and its operations. (See Appendix A for the Review's terms of reference.)

In February 2007, we were appointed by the Minister of Transport, Infrastructure and Communities as an independent Advisory Panel to lead the Review, drawing on our collective expertise in the areas of public administration, law, labour relations, and the rail industry, as well as our ability to remain objective. (See Appendix B for biographies of Advisory Panel members.)

1.2 SCOPE

The scope of the Review encompassed many key issues concerning railway safety in a broad sense. We were asked to review the operations and overall efficiency of the Act, and to provide the Minister with advice on improvements to rail safety.

[3] Joseph F. Schulman, CPCS Transcom Limited, *The State of Rail Safety in Canada* (August 2007), page iii.

In particular, we set out to address the efficiency and effectiveness of the regulatory framework established under the RSA; the provisions and operation of the Act; environmental concerns with respect to railway transportation and accidents; interface with non-railway users; and related railway safety issues.

These broad areas encompassed many specific topics of interest, which included (but were not limited to):

- roles and responsibilities;
- safety management systems;
- monitoring, audit, inspection and enforcement, including enforcement powers;
- human factors, safety awareness and public information;
- modal competition and economic trends;
- baseline safety requirements;
- rule making and consistency of rule application;
- ministerial authority and delegation;
- engineering requirements;
- establishment of a complete legislative authority;
- protection of the environment;
- emergency response;
- crossings, trespassing and vandalism;
- collection, analysis and dissemination of railway safety data; and
- advanced technologies and their use.

It should be noted that security-related provisions of the *Railway Safety Act*, added in 1999, were not part of the Panel's mandate. Our focus was on safety issues.

1.3 PROCESS

In commencing the Review, we considered carefully its objective of further improving railway safety in Canada and, ultimately, promoting a better safety culture within the railway industry. The Review was undertaken with a view to preserving and strengthening the vital role that the railway industry plays in the Canadian economy.

Over a period of several months, a series of public consultations and independent research studies were conducted and formed critical elements in the process leading to the development of the Panel's recommendations.

1.3.1 Stakeholder Consultations

Our approach to learning about the issues was, intentionally, practical. We compiled and contacted an extensive list of stakeholders to encourage broad participation in the Review, and prepared and distributed a *Consultation Guidance Document* to assist them in developing their own formal submissions. A website (www.tc.gc.ca/tcss/RSA_Review-Examen_LSF) dedicated to the Review was created, which contained information on the overall process and made it easier for stakeholders to learn more about the Review and how to participate.

We held 15 public consultation meetings across Canada in all provinces with railway services so that individuals and groups were afforded the opportunity to present their views. We heard over 70 presenters and received over 180 written submissions.

Throughout the course of the Review, we consulted with a wide range of stakeholders, including the public, railway companies and their industry associations, railway company employees and their unions, railway customers (e.g., travellers and shippers), provinces and territories, municipalities, aboriginal interests, environmental groups, and emergency responders, as well as Transport Canada and other federal government departments and agencies.

We met with many people who are involved with rail safety, at all levels and throughout the system, with a view to seeing for ourselves how things worked at various sites across the country. We took a helicopter tour of the Port of Vancouver and the Lower Fraser Valley to better understand the challenges facing railways in transporting goods into the Port of Vancouver. We rode a hi-rail vehicle to see what is involved in railway operations in the Fraser River Canyon area. We visited the sites of the Cheakamus Canyon and Lillooet accidents. These visits left a lasting impression. We took a trip on a track evaluation car and learned more about the technology used to evaluate track conditions. We saw, first-hand, the impact of proximity issues on communities and railways. We toured rail yards, visited the scene of derailments, including at Montmagny, Quebec, and were given emergency response and fire management demonstrations. In every case, we benefited from the opportunity to talk to many dedicated railway workers and officials.

Public Consultation, Halifax, Nova Scotia, July 2007

Bilateral meetings were also held with stakeholders to ensure that frank and open discussion

occurred on issues of specific interest. We met with officials in the United States to learn more about railroad issues and working relationships between the regulator and industry. We also shared our experiences and learned from others in the international rail community while attending the International Railway Safety Conference in Goa, India. (Appendix C provides a chronology of public consultations, meetings and site visits.)

Owing to the broad scope of the Review and the myriad issues that emerged, we were faced with determining where to focus our findings and higher-level recommendations to ensure that the total package would contribute to improving safety. This was a difficult task because of the breadth of the issues and the wide variation of opinions about how to improve the current situation. While the report could not reflect all of the details and suggestions made in the various submissions to the Panel, these submissions are available on the Review's website and we encourage those who may be interested to read them.

All participants in the Review process expressed genuine interest in the issues. No matter how diverse, their views were studied and discussed, and were instrumental in crystallizing the Panel's thinking. This allowed us to develop meaningful observations and recommendations aimed at improving the overall safety picture.

Montmagny, Quebec, June 2007

1.3.2 Research

An integral part of our work involved research conducted by outside consultants. A series of studies was completed to supplement the Panel's knowledge and understanding of a number of subject areas, including:

- the state of rail safety in Canada;
- technical causes of accidents and mitigation strategies;
- causes of accidents and mitigation strategies related to human factors;
- Canada-U.S. comparisons and harmonization issues;
- governance of rail safety;
- the regulatory framework for rail safety;
- safety management systems;
- performance measurement;
- environmental issues;
- the development of the *Work/Rest Rules*; and
- the impact of technology on safety.

The findings and recommendations of these research studies were reviewed and discussed by the Panel and provided key input for the development of our recommendations. A list of the research studies and consultants is contained in Appendix D of this report. The studies are available on the Review's website.

1.3.3 Development of Recommendations

The Panel heard a wide range of views from stakeholders in the railway world. The scope and content of submissions varied widely. Nonetheless, the following themes emerged, which guided the Panel in coalescing its recommendations and developing the report.

- State of Rail Safety
- Governance
- Regulatory Framework
- Safety Management Systems (SMS)
- Information Collection, Analysis and Dissemination
- Proximity Issues
- Environmental Protection and Response
- Operational Issues
- Scientific and Technological Innovation

- Resources
- Building Relationships

We developed the recommendations through concerted discussion of key issues, taking into account views expressed in public consultations and the considerable wealth of knowledge obtained through research, including the findings and recommendations of the research studies. The recommendations evolved to the point where the Panel reached consensus on major recommendations. During the process, other considerations were also identified which, while not meriting specific recommendations, led us to make observations about issues that, in our view, deserved prominence in the final report.

Following development of the recommendations, we validated our findings and recommendations with a cross-section of stakeholders by soliciting feedback about whether or not the recommendations were practical and, overall, would serve to improve railway safety. The validation process was useful in leading us to improve and clarify our initial recommendations.

1.4 KEY CHALLENGES FOR THE RAILWAY INDUSTRY AND THE REGULATOR

Based on the information and data analysis available to the Panel, we believe that the safety record of Canada's major railways is among the best in North America. Nevertheless, there has not been sufficient improvement in their safety performance in Canada since the *Railway Safety Act* was last amended in 1999. Main track accidents can be severe and have significant environmental impact. With the exception of accidents and incidents involving dangerous goods, we note that main track derailments have shown an upward trend in recent years. This must be addressed. Also, accidents in railway yards and on spurs are occurring far too frequently and improvement is needed.

Generally speaking, we found that the *Railway Safety Act* and its principles are fundamentally sound, but that a number of legislative improvements are needed. The regulatory framework is founded on performance-based regulations and railway operating rules, and requires attention to ensure that it is implemented properly and effectively. Some areas for improvement are set out below.

- The difference between rules and regulations needs to be better understood. A more structured and inclusive process needs to be developed for rule making and for consultation to ensure the involvement of all interested parties.
- There is a need to determine the baseline safety requirements that must be met before a company commences operations, and for this to be recognized through the issuance of a Rail Operating Certificate.

- The regulatory framework needs to make provision for the regulator to be better equipped with a broader range of enforcement tools, including an administrative monetary penalty scheme.
- The Act needs to be updated to clarify the basis upon which railway safety inspectors exercise their current powers and to better reflect the changing nature of the railway inspector's job to that of auditor, a change brought about by the implementation of SMS a number of years ago.

We support the SMS approach to managing railway safety, but there are implementation challenges. Railway companies need to make concerted efforts to communicate what SMS is and how it can improve safety, and to do so at all levels in their organizations. Companies must capitalize on employee knowledge about hazards and risks in the working environment. They must develop better ways of using SMS information to monitor improvements in their own safety performance records.

The regulator must make safety management systems the key focus of its oversight activities. The regulator also needs to collaborate with the industry in developing meaningful performance indicators and to improve its capacity and approach to auditing railway companies' safety management systems. While progress has been made by both the industry and the regulator, much remains to be done in terms of ensuring proper training in SMS and effective implementation.

In terms of overall safety culture, from the Panel's experience, passenger railways, and VIA Rail in particular, have a commendable safety culture. CP has made great strides in improving its approach to safety management and to developing a healthy safety culture in its company. On the other hand, in the Panel's opinion, CN's strict adherence to a rules-based approach, focussed largely on disciplinary actions when mistakes are made, has instilled a "culture of fear and discipline" and is counter to an effective safety management system. CN needs to acknowledge this openly and take concrete steps to improve.

Understanding how well the railway industry is performing from a safety perspective depends on timely and reliable data. Currently, data collection, analysis and dissemination pose a huge challenge – for both the industry and the regulator. In part, this challenge stems from the nature and extent of reporting requirements for different purposes, railway companies, and government departments. In addition, there are deficiencies in publicly available data that make it difficult to determine, unequivocally, how well the industry is performing from a safety perspective. It is not an easy challenge to address, but clear and pertinent reporting requirements are needed, coupled with improved analysis and dissemination of safety data.

We are also aware that railway safety depends on good collaboration among many stakeholders with different interests, including those at all levels of government, public and private sector organizations, and the public. This became particularly

apparent when issues that are foremost in the public's mind, such as those involving proximity of railways to communities, and environmental concerns, were brought to our attention.

Challenges are certainly posed for railways and others in terms of continuously reinforcing safety messages and educating the public so that the potential for accidents is minimized. A preventative rather than a reactive approach is key. Emergency response also poses a challenge. In collaboration with the provinces, the regulator should take the lead with railways and affected communities in developing an emergency response protocol and standard to address responses to accidents. We know that the collaborative approach can be successful. This has been demonstrated by the cooperative efforts of railway companies, Transport Canada and communities across Canada to reduce crossing and trespassing accidents. These efforts have led to tangible, positive results and we support a continued focus in this area.

Like many other industries, the railway industry has made scientific and technological advances and appears keen to pursue innovations that hold promise for improving safety. Nevertheless, it became evident that the industry is facing specific, safety-related operational issues that affect people and equipment. These include fatigue management, locomotive design, locomotive event and voice recorders, rail traffic control locations, track and infrastructure, training, train dynamics, and drug and alcohol programs. The Panel recognizes that further efforts are required to address these operational issues.

Transport Canada is facing significant financial and human resource challenges. With rail traffic growing and the railway industry flourishing, there are increasing demands on the regulator for ongoing monitoring and auditing of safety management systems. This means that the regulator must be adequately funded if it is to maintain effective delivery of the regulatory oversight program. Human resource concerns derive, in part, from changing demographics and lead to the need to develop and fund concrete action plans for recruiting and retaining individuals with the right skills. Transport Canada must enhance its financial and human resource capacity to better perform its important rail safety oversight role.

As a Panel, we firmly believe that the future success of railway safety depends upon building strong and effective relationships amongst all those whose primary interest is railway safety – but especially between the railway industry and the regulator. Strong and effective relationships are imperative to making much needed safety gains. Transport Canada oversees a national rail transportation system and needs to find ways to improve communication on rail safety objectives within that national framework.

At the end of the Review process, it is fair to say that the Panel concluded that Canadian railways are safe but should be safer. We recognized that there is a need

for railways and the regulator to take action in certain areas to improve safety. We believe that they are missing opportunities to do so – such as having better data for measuring and analyzing safety performance, encouraging participation at all levels in implementing effective safety management systems, and taking steps to enhance the regulator's capacity to perform its important safety oversight role.

Our report focuses on many other areas where improvements can be made. In some cases, recommendations set out a general direction or approach to be considered in taking further action and, in other instances, specific changes are recommended. In all cases, our recommendations are aimed at having a positive impact on the overall safety of the rail transportation system.

The Panel finds that the *Railway Safety Act* and its general principles are fundamentally sound, but it recommends that a number of improvements be implemented.

1.5 A WORD OF THANKS

Finally, we would like to express our appreciation for the dedication and commitment of everyone who participated in the Review. The willingness to devote time and energy to the process, to make written submissions and presentations, to provide us with insights and information, and to speak openly and freely was invaluable. It enriched our understanding of the issues and provided us with much food for thought.

While it would be impractical to name and thank every participant individually, we would like to extend our special thanks to railway company management and employees, the Railway Association of Canada (RAC), and Transport Canada for their participation, and for meeting numerous requests for information in a timely and professional manner. It is evident to us that there was enormous commitment to the Review and to working towards the common goal of improving railway safety, now and in the future.

CHAPTER 2

STATE OF RAIL SAFETY IN CANADA

An important initial step in conducting the *Railway Safety Act* (RSA) Review was to examine and understand the current state of rail safety in Canada. We examined published statistics on rail accidents and incidents and commissioned independent research on this subject. Using this information, we examined the safety record of railways in terms of total accidents, category of accident (i.e., main track, non-main track, grade crossing, trespasser and dangerous goods), and severity.

In assessing the results, it became clear that the publicly available data has limitations. In our examination of the information, we identified certain key factors that make it difficult to rely exclusively on the numbers and draw firm conclusions about the overall state of rail safety. These included the following:

- changes to the reporting regulations implemented in 1992 affected the number of accidents being reported;
- accident rates are not normalized in a manner that effectively takes into account fluctuations in railway traffic over time;
- data does not reflect changes in the size of the rail network under federal jurisdiction, such as the proliferation of short lines in the 1990s and the July 2004 CN takeover of BC Rail;
- comprehensive severity data is not available to accurately assess the consequences and impact of rail accidents;
- the Transportation Safety Board (TSB)[1] database does not include data on provincial railways, making it impossible to get a complete picture of the state of rail safety in Canada; and
- the TSB recently clarified its reporting requirements and adjusted its statistics for the previous five years to deal with a difference in interpretation of the reporting requirements.

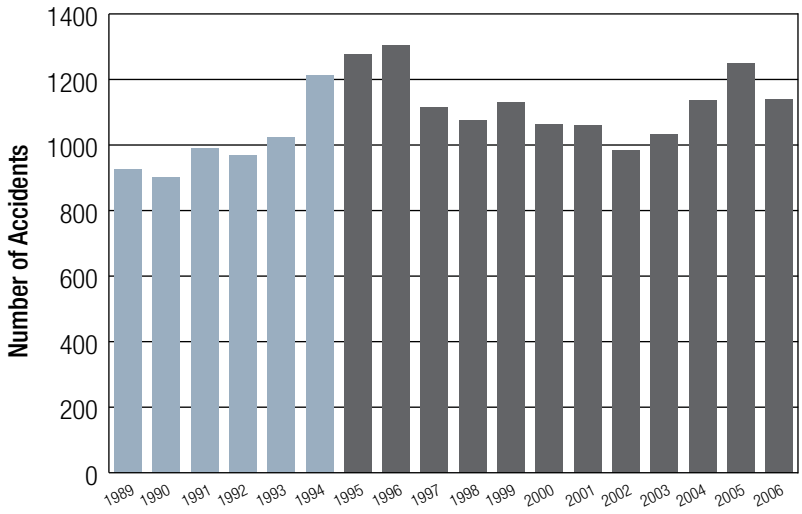
Despite these shortcomings, the Panel was able to make certain observations about the state of rail safety in Canada but the numbers tell only part of the story. In examining the data, the Panel was sensitive to the fact that the state of rail safety also has to be measured in terms of whether the risk of accidents and the resulting damage to people, property or the environment is acceptable to the public.

[1] The *Transportation Safety Board (TSB) Regulations* require that all accidents or incidents in Canada as set out in the Regulations be reported to the Board, making it a major source of Canadian railway occurrence data.

2.1 ACCIDENTS 1989-2006

Looking strictly at the total number of accidents reported to the TSB in the years since the RSA was implemented, as depicted in Figure 2.1, there are clearly two periods during which accidents increased – 1992-96 and 2002-05. Several factors contributed to these changes.

FIGURE 2.1: TOTAL REPORTED RAIL ACCIDENTS (1989-2006)[2]



The first increase can be attributed partially to new TSB reporting requirements, put in place in 1992, which resulted in new cases being reported. The TSB notes that the full effects of the new requirements were incorporated by the end of 1994. This makes it difficult to compare pre-1994 and post-1994 data; consequently, the two periods are differentiated in Figure 2.1.

The sale of federal lines to provincial railways probably contributed to the decrease noted between 1997-2002, since statistics were then being collected for a smaller overall network. Similarly, CN's 2004 acquisition of BC Rail undoubtedly accounted for at least part of the recent increase in the total number of reported accidents, since statistics were then being collected for a larger network.[3] The acquisition of BC Rail is also noteworthy since it added largely mountain-grade track, which by its very nature, may be inherently more risky. During this period, freight traffic grew steadily.

[2] Joseph F. Schulman, CPCS Transcom Limited, *The State of Rail Safety in Canada* (August 2007), Figure 2.1, based on Transportation Safety Board (TSB) data.

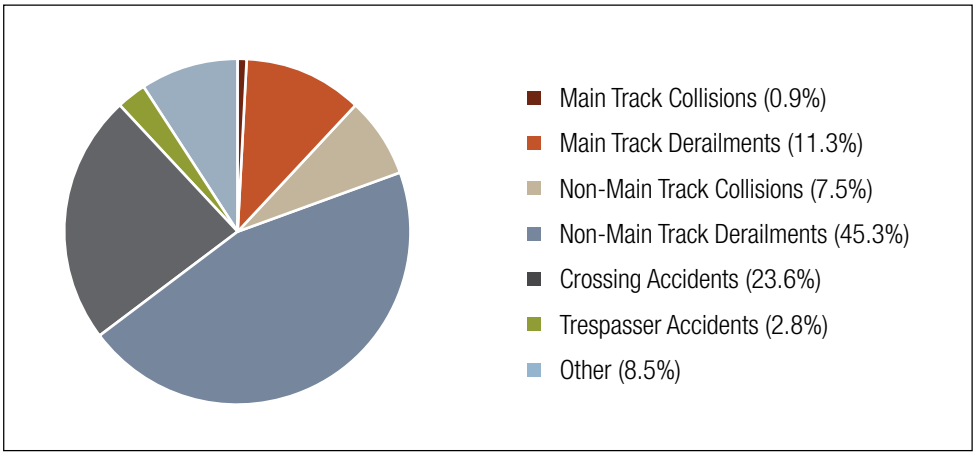
[3] Ibid. section 2.

Examining only the absolute number of rail accidents, however, limits the conclusions that can be made for the reasons outlined at the beginning of this chapter. To better understand trends and whether there has been improvement or deterioration in safety performance in recent years, we looked at different presentations and interpretations of the available data.

2.2 CATEGORIES OF ACCIDENTS

Essential to the understanding of the state of rail safety is an examination of the accidents by category, since each category has differing causes, consequences and trends. Figure 2.2 shows the main categories of rail accidents and their percentage in terms of total accidents for 2006.

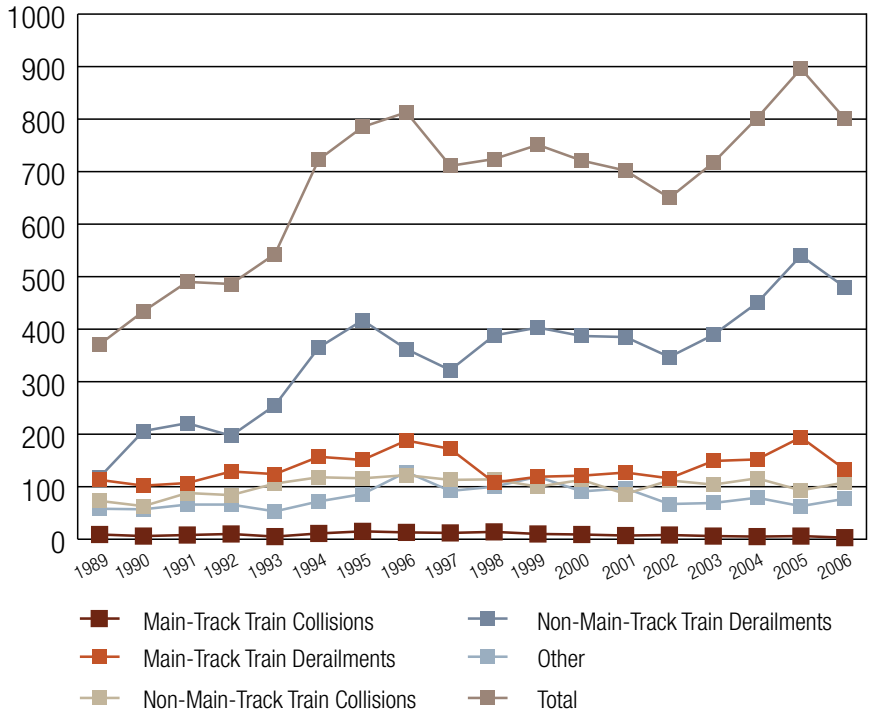
FIGURE 2.2: DISTRIBUTION OF RAILWAY ACCIDENTS BY CATEGORY (2006)[4]



[4] Based on Schulman, *State of Rail Safety*, op. cit., Figure 2.2, with updated information from the TSB.

Figure 2.3 shows the trends in each of the main categories of accidents for the period 1989-2006.

FIGURE 2.3: RAIL ACCIDENTS EXCLUDING CROSSING AND TRESPASSER ACCIDENTS (1989-2006)[5]



2.2.1 Main Track Accidents

Main track accidents are collisions and derailments that occur on track between stations or terminals, including branch or feeder lines. Main track accidents accounted for 12.2 per cent of all accidents in 2006. The severity of these accidents varies from minor to significant, though they have the greatest potential for catastrophic impacts that affect public confidence. For instance, recent derailments at Squamish and Lillooet, British Columbia, Montmagny, Quebec and Lake Wabamun, Alberta, were all main track accidents. A lack of comprehensive severity indicators, however, makes it difficult to ascertain whether the severity of accidents is worsening. However, available data does indicate that some 66 per cent of Canadian main track derailments involve five cars or less.[6]

[5] Schulman, *State of Rail Safety*, op. cit., Figure 2.3, based on TSB data.

[6] G.W. English and T.W. Moynihan, TranSys Research Ltd., *Causes of Accidents and Mitigation Strategies* (July 2007), section 2.2.2

Since main track collisions occur very infrequently, our focus is main track derailments, the number of which has fluctuated. While it would seem that the recent upward trend (1998-2005) reversed somewhat in 2006, TSB data to July 2007 shows that main track derailments are higher than in 2006 and near the five-year average (2002-06).[7] As noted earlier, these are the accidents with the greatest consequences in terms of property and environmental damage. In considering the impacts, the Panel is concerned that there has not been a sufficient reduction in the number of main track derailments.

2.2.2 Non-Main Track Accidents

Non-main track accidents include collisions and derailments that occur primarily in yards or terminals. At 52.8 per cent, non-main track accidents represent the largest category of total accidents, as seen in Figure 2.2.

In examining non-main track collisions and derailments, it is clear that the increase in the total number of accidents (excluding crossing and trespasser accidents) is largely the result of increases in non-main track derailments. These accidents decreased in 2006 and the Panel was pleased to learn that TSB statistics (July 2007 year-to-date) show that the frequency of non-main track derailments continues to decrease from 2006 levels.[8] Despite this, the Panel was concerned about the steep increase from 2002-2005 and the fact that there continues to be such a large number of these accidents. We believe that railway companies need to focus more attention on safety in yards.

2.2.3 Crossing and Trespasser Accidents

Crossing accidents occur at road and rail intersections and involve third parties, such as vehicles or pedestrians. Crossing accidents comprised 23.6 per cent of total accidents in 2006. Trespasser accidents involve people trespassing on railway rights-of-way and are distinct from pedestrian accidents that occur at road and rail crossings. In 2006, 2.8 per cent of the total accidents were classified as trespasser accidents.

The impact of crossing and trespasser accidents is devastating for those affected. Since 2001, an average of 84 people have been killed or seriously injured annually as a result of crossing accidents, and an average of 79 people have been killed or seriously injured each year due to trespasser accidents.[9]

[7] Transportation Safety Board of Canada, *Rail Occurrence and Casualty Statistics for July 2007* http://www.tsb.gc.ca/en/stats/rail/2007_jul/R07_2007_e.pdf, Table 3.

[8] Ibid., Table 4.

[9] Schulman, *State of Rail Safety*, op. cit., section 2.2.2, based on TSB data.

FIGURE 2.4: CROSSING AND TRESPASSER ACCIDENTS (1989-2006)[10]

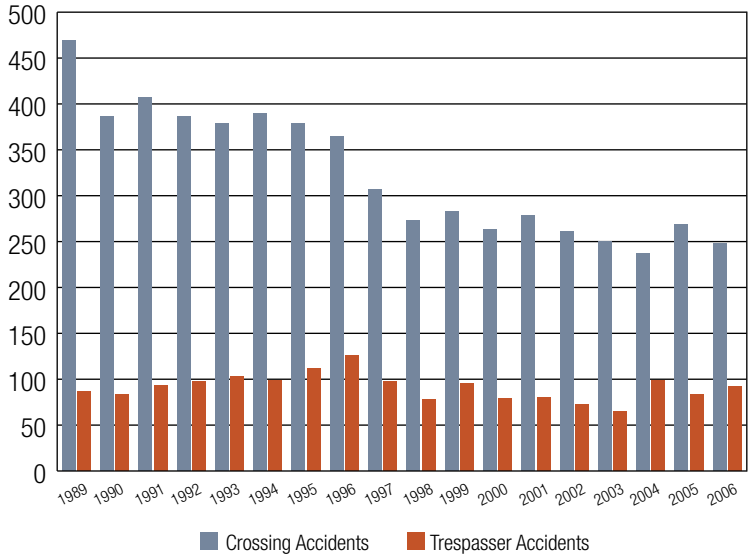


Figure 2.4 shows that while there is very little evidence of any trend in trespasser accidents, crossing accidents show a clear downward trend from a high of 469 in 1989 to 248 in 2006. In part, this decrease in crossing accidents can be attributed to public education and outreach programs, such as Operation Lifesaver and Direction 2006, and safety improvement programs, such as those funded through the Grade Crossing Improvement Program. These programs are the result of combined efforts by railway companies, Transport Canada, other levels of government, public safety organizations, police, unions and community groups. It is likely that the decrease in accidents has also been affected by the transfer of many crossings to provincial railways, since accidents at those crossings are no longer reflected in the TSB database.

While the number of crossing accidents has decreased, when coupled with trespasser accidents, they remain the cause of almost all railway fatalities and serious injuries. In 2006, for instance, 87 per cent of the total number of serious injuries and fatalities resulting from all types of rail accidents were due to crossing and trespasser accidents. More specifically, in 2006, 142 people were killed or seriously injured as a result of crossing or trespasser accidents.[11] Tragically, a proportion of these incidents is due to suicide, and such accidents are difficult to prevent.

[10] Ibid., Figure 2.4, based on TSB data.

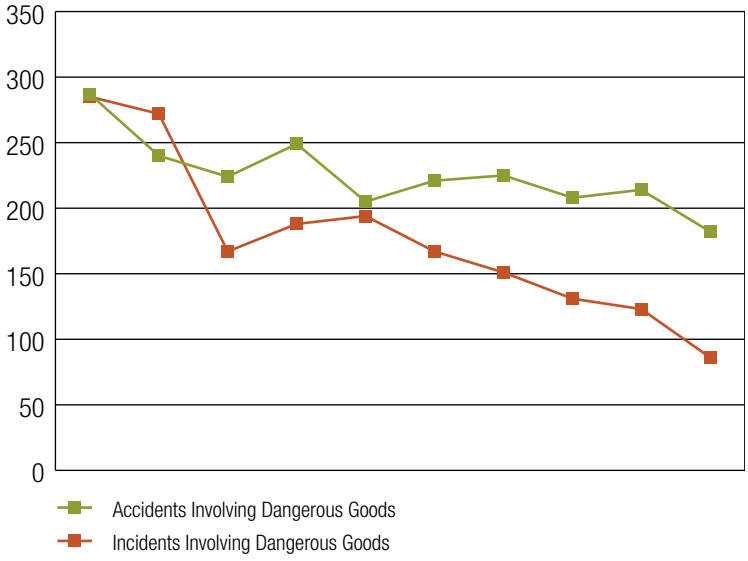
[11] Ibid., section 3.2.1.

While passenger rail operations comprise only a small part of overall railway operations in Canada, given the nature of their operations (involving relatively lighter trains, moving at high speeds), it is not unexpected that the majority of accidents involving passenger trains are crossing and trespasser accidents.[12] Nevertheless, the Panel is confident that with sustained effort from all partners, further improvements can be made to prevent crossing and trespasser accidents. Our ideas are discussed further in Chapter 7.

2.2.4 Transportation of Dangerous Goods Accidents and Incidents

The transportation of dangerous goods by rail has grown rapidly over the past decade.[13] For CN and CP combined, rail transport of regulated dangerous goods between 1997 and 2006 has grown by close to 60 per cent in terms of thousands of freight cars moved and millions of revenue ton miles. The Panel is pleased to note that, over this same period, reportable accidents and incidents (as defined by the Transportation Safety Board Regulations) involving regulated dangerous goods have declined considerably, as shown in Figure 2.5.[14]

FIGURE 2.5: TSB REPORTABLE RAIL ACCIDENTS AND INCIDENTS INVOLVING DANGEROUS GOODS[15]



[12] Ibid., section 5.

[13] Currently, almost 2,870 substances are considered dangerous goods under the *Transportation of Dangerous Goods Act*. Amendments expected in early 2008 will increase that number to approximately 3,000.

[14] Schulman, *State of Rail Safety*, op. cit., section 6.1.

[15] Ibid., Figure 6.4, based on TSB data.

Crossing, trespasser and dangerous goods accidents have been the subject of special public education and funding efforts that demonstrate what can be accomplished when there is a will to continuously improve. The Panel strongly encourages continued government-industry collaboration to improve safety performance in other areas such as non-main track derailments and main track accidents. Given the severity and tragic impact of crossing and trespasser accidents, efforts to reduce them must continue.

2.3 NORMALIZING ACCIDENTS

The Panel agrees with the industry that its safety performance is better reflected when traffic volumes are taken into account by using a normalizing factor. An accident rate per million train miles is commonly used to normalize the number of accidents relative to the amount of railway activity. This normalization adds little to our understanding of accident trends over time, however, since essentially the same picture emerges as was presented in Figure 2.1.[16]

Various other measures can be used to normalize accident rates, such as accidents per billion gross ton miles or per billion car kilometres. The current practice for normalizing accident rates does not necessarily provide an in-depth understanding of overall safety performance or where improvement is needed. This issue is explored in greater detail in Chapter 6.

2.4 COMPARING RAIL SAFETY IN CANADA AND THE U.S.

The Panel was also interested in comparing the safety records of Canadian railways with those of similar U.S. operators. Regrettably, due to differences in reporting criteria, it was difficult to make the statistical comparison.

Nonetheless, in determining their overall safety performance, both CN and CP collect data about their extensive U.S. operations, as well as their Canadian operations. This information provides a means for both companies to benchmark their performance against that of their U.S. competitors.

In examining the average number of accidents per million train miles from 1996-2006 for CN and CP's operations (which includes both their U.S. and Canadian operations), the rates are lower than for comparable U.S.-based operators. Interestingly, the accident rates for both CN and CP increase,[17] if only the U.S. portion of their operations is considered. This means that their Canadian safety records are having a positive impact on their overall North American safety performance, which is commendable.

[16] Ibid., section 3.1.

[17] Ibid., section 8.

In conclusion, while rail continues to be one of the safest modes of transportation and Canada's railways are among the safest in North America, the Panel is concerned that overall safety has not significantly improved since the *Railway Safety Act* was last amended in 1999. We think that it should have.

The Panel believes that continuous improvement is important to achieving a better safety record. Certain accident categories have seen little improvement in accident rates over time, while others are worsening and have the potential to negatively affect public confidence in the railway system. Nonetheless, we also observed stronger safety records in certain areas and believe they are the result of sustained efforts to improve safety. They demonstrate that it is possible to improve the overall safety of the railway system in Canada. The Panel believes that success depends on both the railway industry and the regulator working together to achieve that common goal.

CHAPTER 3
GOVERNANCE

Governance of railway safety in Canada – the process by which the institutions, organizations and individuals involved communicate with each other, make decisions, are accountable and generally guide themselves – is the foundation of the regulatory framework and the relationships among its participants. Governance defines, both formally and informally, the roles and responsibilities of the players.

We discovered that governance issues (whether or not they were labelled as such) lie at the heart of many of the concerns and frustrations brought to our attention during this Review.[1] Are the roles and responsibilities of all participants clear and well understood? Are these responsibilities carried out consistently and with full accountability, in the public interest? Are communications and consultations effective for all players, no matter how small or large, or where they are located in Canada? How can the spirit of mutual trust and collaboration be assured?

We were also directed, by the terms of reference of the Review, to examine certain issues that are specifically matters of governance. We have found that there are elements of the existing governance structure for railway safety that are not being used effectively, and there are elements that can be added or changed to make it work better.

3.1 ORGANIZATIONS, ROLES AND RESPONSIBILITIES

A variety of institutions, organizations and individuals are involved with railway safety in Canada. These include federal departments and agencies, provinces, railway companies, labour unions, and other stakeholders.

3.1.1 Federal Departments and Agencies

Transport Canada has overall responsibility for "a transportation system in Canada that is recognized worldwide as safe and secure, efficient and environmentally responsible."[2]

For railway safety, this overall responsibility is delivered, principally, by the Rail Safety Directorate. It is responsible for developing and implementing policies, regulations and services, as well as the overall administration of the *Railway Safety Act,*

[1] See also James Mitchell and Nigel Chippindale, Sussex Circle Inc., *The Governance of Railway Safety in Canada* (September 2007), a report of research commissioned by the Panel (see section 6).

[2] The department's "Vision Statement," from *Transport Canada: 2006-2007 Departmental Performance Report*, for the period ending March 31, 2006, page 4.

and the *Railway Relocation and Crossing Act,* which is intended to facilitate relocation of railway lines or re-routing of railway traffic in urban areas. The Rail Safety Directorate also oversees operating rules that are developed and applied by the railway industry.

The Transport Dangerous Goods Directorate administers the *Transportation of Dangerous Goods Act*, which applies to all modes of transport throughout Canada. The Act governs the handling, offering for transport, transporting and importing of dangerous goods, and their means of containment and transport.[3]

The surface branches in Transport Canada's five regions are responsible for delivery of the regulatory oversight program for railway safety and the transport of dangerous goods. Their activities include inspections and audits, emergency response planning, and public information and education. The regions are the primary points of contact on federal railway regulation for provincial transportation authorities. Transport Canada's regions also provide inspection services to provinces on a contractual basis.

The Rail Policy Branch (at national headquarters) provides ongoing policy advice to the Minister of Transport on a broad range of factors that pertain to Canada's railway industry, and is responsible for administering the subsidy to VIA Rail, and for the federal government's fleet of 12,000 hopper cars used in the transportation of western grain.

The **Transportation Safety Board (TSB) of Canada** was created under the *Canadian Transportation Accident Investigation and Safety Board Act* to advance safety by conducting accident investigations for the full range of transportation modes under federal jurisdiction. It is independent of Transport Canada, and reports to Parliament through the President of the Queen's Privy Council for Canada. Its findings and recommendations are conveyed to the minister(s) responsible for the department or departments most closely affected. In many cases, this is the Minister of Transport.

The TSB fulfills its mandate by:

a) conducting independent investigations, including, when necessary, public inquiries, into selected transportation occurrences in order to make findings as to their causes and contributing factors;

b) identifying safety deficiencies as evidenced by transportation occurrences;

[3] *Transportation of Dangerous Goods Act 1992* (1992, c. 34), s. 5.

c) making recommendations designed to eliminate or reduce any such safety deficiencies; and

d) reporting publicly on its investigations and on the findings in relation thereto.[4]

The TSB also collects information about accidents and incidents, as set out in regulations, and publishes periodic summaries and analyses of that information. Further, it provides services and advice to provincial authorities, under specific agreements or memoranda of understanding, with respect to accidents and incidents on railways under their jurisdiction.

TSB regulations require that accidents and incidents be reported to the Board. The resulting statistics are published in monthly and annual reports.

The **Transportation Appeal Tribunal of Canada (TATC)** is a quasi-judicial body established pursuant to the *Transportation Appeal Tribunal of Canada Act.* It reports to Parliament through a minister designated for this purpose by Cabinet. The TATC provides an independent review process for anyone who has been given notice of an administrative or enforcement action taken by the Minister of Transport, railway safety inspectors or the Canadian Transportation Agency, under various federal transportation acts. One of these is the *Railway Safety Act.* An order of a railway safety inspector under section 31, for example, or an order of the Minister under section 32 may be appealed to the TATC.[5]

The **Canadian Transportation Agency (CTA)** was created by the *Canada Transportation Act* in 1996 to deal with issues of economic regulation, market entry and dispute resolution for the whole spectrum of transport modes under federal jurisdiction. The CTA is an independent, quasi-judicial administrative tribunal reporting to Parliament through the Minister of Transport. The CTA has regulatory powers over economic matters such as licensing, cost apportionment, and competitive access.

While it has a limited role in railway safety, the CTA is responsible for issuing the Certificate of Fitness required to start the operation of a railway under federal jurisdiction. The CTA also addresses various issues relating to level crossings and right of access for owners of land adjoining railways, areas of potential safety concern. It also deals with complaints and disputes over such matters as rates charged by carriers, treatment of passengers (including accessibility), and proximity issues like noise and vibrations.

[4] *Canadian Transportation Accident Investigation and Safety Board Act* (1989, c. 3), s. 7(1).

[5] The TATC replaced the Civil Aviation Tribunal, under legislation that came into force in June 2003. At that time its mandate was expanded to cover the rail sector.

Human Resources and Social Development Canada, through its Labour Program, administers and enforces Part II of the *Canada Labour Code*. This relates to occupational health and safety and seeks to reduce workplace injuries and accidents. The Code applies to federally regulated workplaces, including railways under federal jurisdiction. The Labour Program responsibilities are discussed in more depth in Chapter 4.

Environment Canada is responsible for the *Canadian Environmental Protection Act*, 1999, which concerns "pollution prevention and the protection of the environment and human health in order to contribute to sustainable development." The Department may be involved, therefore, in safety-related issues involving spills or other environmental incidents. Environmental response, clean up and remediation also fall under provincial and municipal jurisdictions.

3.1.2 Provinces

Railways have traditionally been viewed as an area of federal jurisdiction, but the sale or lease of track by the major carriers in the 1990s led to the creation of many short lines that fall within provincial jurisdiction. Provinces are also responsible for their municipalities through various regulatory instruments that govern planning and development, emergency services, and environmental protection.

3.1.3 Railway Companies

In total, there are 34 federally regulated railways in Canada (see Appendix E). These operate under a Certificate of Fitness issued by the CTA and are subject directly to the *Railway Safety Act*.

The Act recognizes very clearly in its objectives "the responsibility of railway companies in ensuring the safety of their operations."[6] This is the foundation of the spirit of cooperation between industry and government that we consider to be a significant strength of the *Railway Safety Act*, and which we consider can continue to support a safe railway system in Canada.

Railway companies are given powers under the RSA to develop rules in respect of many matters governed by the Act. The Minister may also order a railway company to develop a rule in certain circumstances. In any case, the Minister must approve all rules. This collaborative approach is intended to be responsive and adaptive to the needs of a particular railway or group of railways, and to complement the development of regulations, by Transport Canada, which apply to the industry as a whole.

Railway companies may also establish their own police services, and CN and CP have had such services for many decades. Their responsibilities are to enforce federal laws

[6] *Railway Safety Act* (1985, c. 32 (4th Supp.)), s. 3 (c).

on railway property and within 500 metres of that property,[7] to protect persons and property within that zone, and ensure a safe and secure environment for rail traffic. Railway police officers have powers of arrest and enforcement similar to those granted to other federal and provincial police officers.

The **Railway Association of Canada (RAC)** represents some 60 federal and provincial railways. Members include freight, tourist, commuter, and intercity operations. The RAC's mission is to promote the safety, viability, and growth of the railway industry within Canada. As discussed in Chapter 4, the RAC is often the organization that develops rules under the RSA, on behalf of its member railway companies.

3.1.4 Labour Unions

Since the 19th century, labour unions have played an important role in railway safety, and many different unions currently represent workers in the various trades and work categories involved in the railway industry across Canada. The Panel heard from four trade unions in particular, which have significant and widespread railway-related membership:

- Teamsters Canada Rail Conference (TCRC), created in 2004 from the Brotherhood of Locomotive Engineers and Trainmen. Conductors, trainmen and yardmen subsequently joined the TCRC, as did maintenance workers and traffic controllers, for a total of approximately 10,000 members.
- United Steelworkers represents some 3,200 CN track workers plus a range of workers at other railways.
- United Transportation Union represents some 2,800 conductors and yard workers at CN.
- CAW-TCA (formerly Canadian Auto Workers), the largest private sector union in Canada, has 11,500 members in the rail transportation sector working for CP, CN, VIA and Ontario Northland in a wide range of jobs, including maintenance, ticket sales, clerical and on-board services.

3.1.5 Other Stakeholders

Others are directly affected by railway safety and are eager to contribute to an effective and efficient regulatory framework. These include municipal authorities, First Nations, landowners and residents near tracks and yards, users of roads at crossings, and customers of railway companies (including intermodal carriers) who expect safe and timely deliveries. The public is generally interested in protection of the environment and sustainable development, and issues that affect the transportation network as a whole.

[7] The statutory authorities for railway police were transferred to the RSA from the *Canada Transportation Act* in June 2007.

3.2 ACCOUNTABILITY WITHIN TRANSPORT CANADA

Transport Canada delivers its programs by means of a national headquarters and regional structure, like many public and private sector organizations with geographically widespread activities. The Transport Canada, Rail Safety Directorate (national headquarters in Ottawa) is responsible for the overall railway safety framework, including administration of the *Railway Safety Act*. There are five regional offices – Atlantic, Quebec, Ontario, Prairie and Northern, and Pacific – each headed by a Regional Director General who reports directly to the Deputy Minister of Transport on all aspects of Transport Canada's mandate in that region. Railway safety inspectors designated under the RSA operate from the Rail Safety Directorate national headquarters and from all regional offices.

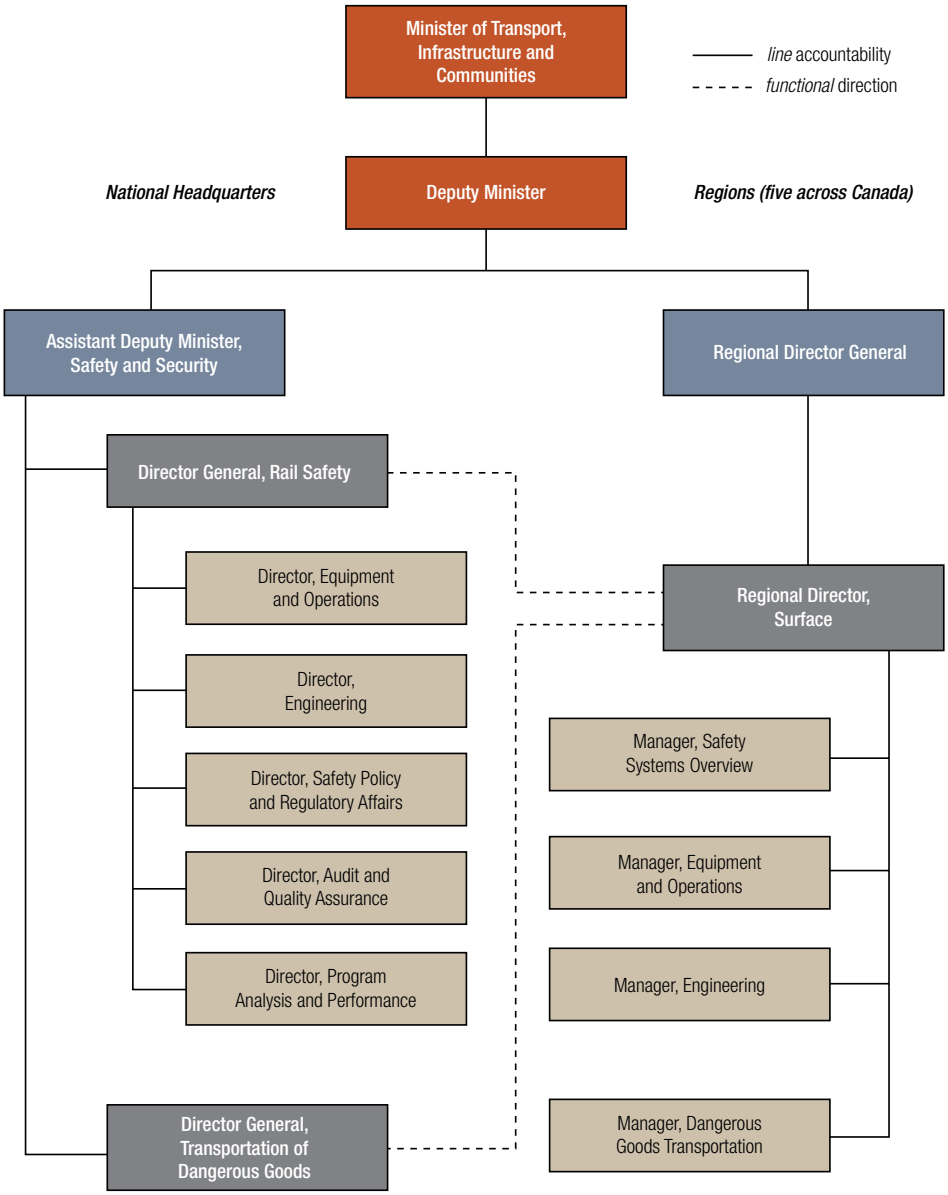
A simplified overview of reporting relationships is shown in Figure 3.1. This regional structure is intended to establish a proper balance between the need for clear, uniform principles across the federally regulated sector without excessive rigidity, and application and enforcement of those principles in ways that are appropriate to each region. It is comparable to the structures of many federal departments.

The Director General of Rail Safety reports to the Assistant Deputy Minister, Safety and Security, who is also responsible for safety and security in all transportation modes, as well as emergency preparedness and the transportation of dangerous goods. At national headquarters, the railway safety program depends on specialized teams led by directors of key operating branches, as shown in Figure 3.1.

Each of the five regions has a Regional Director, Surface, reporting to the Regional Director General. In most regions, three managers responsible for aspects of railway safety report to the Regional Director, Surface. The Manager, Dangerous Goods Transportation (for all transportation modes) also reports to the Regional Director, Surface in each region. Regional offices are the immediate contact points for operating divisions of railway companies, provincial authorities and agencies, municipalities, and for regional operations of other federal departments.

Railway safety inspectors from the regions conduct inspections and other activities for several provincial governments under memoranda of understanding with Transport Canada. They have considerable autonomy to determine the most appropriate resolution of an issue for local conditions. Their line accountability is through the Regional Director General to the Deputy Minister, not through the Director General, Rail Safety.

FIGURE 3.1: TRANSPORT CANADA – ORGANIZATIONAL STRUCTURE FOR RAILWAY SAFETY



We heard that this organizational model may tend to create very independent regions, and presents a challenge for the Director General, Rail Safety to achieve national consistency. We were told about differences in inspection and enforcement actions from region to region, which have led to misunderstandings and a certain loss of trust, both within Transport Canada, and between Transport Canada and railway companies. Some suggested that the activities of railway companies that operate nationally could be overseen directly by railway safety inspectors who report to national headquarters in Ottawa, as is the case in Transport Canada, Civil Aviation for large air carriers. Alternatively, the suggestion was made that Regional Directors, Surface could report directly to the Director General, Rail Safety.

We are not convinced that change in Transport Canada's reporting structure is required, nor that such change would necessarily result in greater consistency, without giving up the benefits of flexibility and suitability to local circumstances. We note that railway companies also adapt their procedures and systems to regional conditions – indeed, as long as they are consistent with the overall framework, we consider this to be one of the strengths of the modern regulatory approach of the *Railway Safety Act*.

The Panel would like to see Transport Canada, Rail Safety Directorate strengthen its processes and practices to provide clear direction on national matters of safety. The existing departmental organization provides for functional direction and guidance through:

- written statements of policy or interpretations (which should be developed cooperatively between national headquarters and the regions);[8]
- sharing of good practices and lessons learned;
- regular meetings, workshops, and conferences; and
- training.

The objectives and anticipated results for railway safety within a national framework for Canada should be developed collaboratively, and agreed upon, by Rail Safety Directorate national headquarters and the regions. This would allow for a reasonable degree of flexibility and adaptation to the railway safety needs of a specific region, and to the overall priorities of that region. Regional managers, directors and directors general would be held accountable for their actions within that national framework.

[8] We note that Transport Canada's *Rail Safety: Compliance and Enforcement Policy*, issued in September 2007, directs RSIs who are considering enforcement options to advise regional management and Transport Canada national headquarters, to seek functional guidance, if they believe the "observed instance of non-compliance or safety concern goes beyond a single instance and may be wide-spread, including across more than one region." This is a good example of the practices we recommend.

RECOMMENDATION 1

Transport Canada, Rail Safety Directorate should assert its existing responsibility to provide functional direction to regions to ensure:

- **clear and consistent guidance on matters of rail safety rules and regulations;**
- **effective communication on rail safety objectives within a national framework; and**
- **regional managers are held accountable for their actions within that framework.**

3.2.1 Powers of Railway Safety Inspectors

One of the issues we were asked to examine in the course of our Review is how enforcement powers should be delegated to railway safety inspectors (RSIs) under the RSA – how to rationalize the delegation of power to RSIs while preserving their role in dealing with critical safety issues. From our perspective, this is an area where improved guidance and decision-making processes would help to support Transport Canada in exercising its regulatory responsibilities for railway safety.

The Minister of Transport currently designates RSIs for one or more matters (such as equipment, operations, or engineering), as set out in section 27 of the RSA. This power to designate inspectors has been delegated to the Director General, Rail Safety. Once designated, RSIs carry out their responsibilities, with the powers directly delegated to them in the RSA, rather than via the Minister. RSIs have significant powers under section 28 of the RSA to enter premises, inspect, seize property and question people.

Section 31 gives RSIs the powers to issue a notice (if there is a threat to railway safety), or a notice and order (if the threat is immediate), where they believe line works, railway equipment, crossings or vehicles pose a threat to safe operation. In both cases, they must provide their reasons for the action. For example, section 31(3) reads:

> (3) If a railway safety inspector is of the opinion that the operation of a line work or railway equipment of a particular railway company threatens the safety or security of railway operations, the inspector, by notice sent to the company or to any other person who owns or leases the equipment,
>
> (a) shall inform them of that opinion and of the reasons for it; and
>
> (b) may, if the inspector is satisfied that the threat is immediate, order either of them to ensure that the line work or railway equipment not be operated, or not be operated otherwise than under terms and conditions specified in the notice, unless the work or

equipment is operated so as to remove the threat, to the inspector's satisfaction.[9]

The way this power is expressed appears to give RSIs considerable independence, and may have led some to conclude that inspectors are not under the authority of the Minister. It is the apparent autonomy of RSIs under section 31 that has led to differences and inconsistencies, and considerable frustration for both Transport Canada and the railway companies.

The individual powers granted in section 31, however, must not be read in isolation. In particular, section 31(5) requires that the Minister be informed of each section 31 order, and the Minister has independent statutory authority to review the order of an RSI and can confirm, alter or revoke it (section 31.4). Section 31 orders may also be appealed to the Transportation Appeal Tribunal.[10] When section 31 is read as a whole, it is clear that RSIs are not completely independent, and must operate within the authority of the Minister.

The Panel believes that the ministerial powers delegated to the Director General, Rail Safety are sufficient to guide inspectors or to set out the national framework for railway safety within which they should act.

Nonetheless, these powers should not be used in isolation or arbitrarily – indeed, the RSA requires that RSIs provide reasons for their notices, and we have been told that they have recently been advised to include assessment of the threat they have identified. Furthermore, they must immediately inform the Director General, Rail Safety (the Minister's delegate) of the order they have issued, and the reason for it.

In our view, this gives the Director General of Rail Safety and his staff sufficient scope to:

- provide consistent initial and ongoing training, in all aspects of railway safety, not just technical expertise;
- set out guidelines;
- provide standardized language for similar circumstances;
- collect and share best practices; and
- ensure that RSIs are accountable for their enforcement actions.

As we have recommended, Transport Canada, Rail Safety Directorate should assert its existing responsibility to provide functional direction to regions. We note that a step has indeed been taken in this direction, with the publication in September 2007 of the *Rail Safety: Compliance and Enforcement Policy*. We suggest that it would also

[9] RSA s. 31(3), "Inspector may forbid operation of certain works or equipment."

[10] Since 2003.

reinforce clarity and accountability for Transport Canada to make all orders available to the public.

RSIs should seek guidance, through their regional or national headquarters office, but always with the objective of situating their proposed action in the national framework. For example, a template or checklist could be used to determine whether national level guidance is required. Provision of a wider range of compliance tools, including administrative monetary penalties, will be discussed in Chapter 4. We will also discuss how Transport Canada can improve consistency in its guidance for safety management systems.

The Panel recommends, therefore, that there be no change with respect to the delegation of powers to inspectors. For greater certainty and clarity, the RSA should be amended to expressly state that railway safety inspectors exercise their powers under the authority of the Minister.

As noted, the RSA gives the Minister the discretion to reconsider an RSI's order under section 31, "on his or her own initiative."[11] This allows an avenue of appeal for railway companies or any other person affected by such an order, since they can ask for this power to be exercised if they feel that they have been aggrieved. The Minister may ultimately confirm the original order, or alter or revoke it by another order. This is a real option under the Act which, to our knowledge, has never been used. It should be developed into a meaningful process. For example, the Minister could delegate this power to a different level or sector of Transport Canada, or choose not to delegate it at all and exercise it directly. Clarifying the relationship of RSIs to the Minister's authority will assist in bringing rigour and accountability to the national framework for railway safety.

RECOMMENDATION 2

The *Railway Safety Act* should clarify that railway safety inspectors exercise their powers under the authority of the Minister.

3.3 CONSULTATION – TRANSPARENCY AND COMMUNICATION

Effective two-way communication in all aspects of the national railway safety framework is essential to making safety-related decisions, to transparency throughout the regulatory and enforcement processes, and to accountability of all participants. Many submissions stressed the need for active, structured consultation led by Transport Canada, and this view was reinforced by recommendations at public and other meetings – especially with representatives of provincial governments – and by

[11] RSA, s. 31.4.

the research we commissioned.[12] A provision for a formal consultation process was part of the original *Railway Safety Act* (1989), and the committee that undertook the first review of the Act in 1994 recommended "implementation of a robust formal consultation mechanism"[13] (which they found had not yet taken place).

A rigorous, structured consultation process can be an effective tool to provide transparency and build confidence among all participants in the collaborative approach. It does not tie the hands of the regulator – either in making recommendations about the regulatory framework or in taking enforcement actions and ensuring compliance. Nor does it encroach on the authority of the Minister, or indeed on the responsibilities of companies and their employees. By providing for structured exchange of views and positions, effective consultation leads to a shared sense of direction and vision. Indeed, the *Railway Safety Act*, as revised in 1999, specifies that consultation is required when rules are being developed (either at the initiative of railway companies,[14] or of the Minister of Transport).[15] Rules and regulations, however, should not be the only aspect of the national railway safety framework for which consultations are undertaken.

Upon implementation of the amendments to the RSA in 1999, Transport Canada's Rail Safety Directorate did indeed set up a Railway Safety Consultative Committee (RSCC), whose intended role was to:

i. provide a forum for open communication between Transport Canada and their stakeholders on railway safety and environmental issues
ii. inform parties including railway companies, railway labour unions, other government bodies and representatives of the public
iii. establish action priorities for the development of regulations and rules.[16]

However, we learned that the RSCC has not met since October 2001. It seems that the process was quickly seen as unwieldy, and that personal agendas sometimes dominated discussion. Formal membership of the RSCC grew to over 130, and formulation of conclusions and recommendations became difficult. Senior repre-

[12] See, for example, Mitchell and Chippindale, Sussex Circle, Governance, op.cit.; Deana Silverstone, *The Legislative and Institutional Framework for Railway Safety in Canada* (July 2007); Harvey Sims, Sussex Circle Inc., *The Development of Work/Rest Rules for Railway Operating Employees: A Case Study Prepared for the Railway Safety Act Review Panel* (August 2007); submissions from: the Railway Association of Canada (RAC), unions, provincial governments and municipalities.

[13] Railway Safety Act Review Committee, *On Track: The Future of Railway Safety in Canada*, Report of the Railway Safety Act Review Committee (December 1994), pages 54-55.

[14] RSA, s. 20(2).

[15] RSA, s. 19(8).

[16] Transport Canada, Rail Safety Directorate website http://www.tc.gc.ca/railway/RSCC/RSCC.htm; Transport Canada, "Transport Minister Attends Inaugural Meeting of Railway Safety Consultative Committee," *News Release No. H03S/99* (April 21, 1999).

sentatives of key stakeholders – potential decision-makers – were no longer eager to participate. Although meetings were supposed to be held at regular intervals, they were not. We learned that only one member (from a labour union) has asked for a meeting since the RSCC last met in 2001.[17]

An executive committee of the RSCC was also set up, with a much smaller membership, but its role is more limited – to review and prioritize railway safety and environmental issues, to review the progress of working groups, and to establish the RSCC agenda. It too has met infrequently – most recently in December 2006, and before that in January 2006, once in 2003 and three times each in 2000 and 2001.

This is an untenable situation. Consultation must occur for all issues related to railway safety, and at most stages of a process – not just as expressly required under the RSA. It is an essential tool to accomplish specific objectives, and is in keeping with priorities of successive governments for transparency, accountability for public policy, and citizen engagement. Ongoing consultation should be considered a normal routine, and part of a continuing commitment to build good working relationships among stakeholders.

We recommend that the Railway Safety Consultative Committee be revived as a smaller and more focussed group, supported by a permanent secretariat within Transport Canada's Rail Safety Directorate. It should meet regularly for general information sharing and consensus building, with formal operating procedures and a predictable workplan. This approach will support meaningful participation, and members will be more willing to attend meetings if they see that progress is possible.

The revived RSCC should concentrate on strategic issues, including future directions in railway safety, rule making and regulation; policy issues of concern to the regulator and the regulated community; and problems and issues of common concern. A new mandate or charter should be developed for the RSCC, emphasizing that it will address these issues through collective activities. It will be important to build success by starting with smaller projects that can be resolved relatively quickly.

The role of the RSCC should not be limited only to those aspects of railway safety for which the RSA requires consultation, nor to narrowly defined categories of stakeholders.[18] For example, it could also be used for the consultation phase with Transport Canada and relevant stakeholders for proposed rules being developed by, or on behalf of, railway companies. It could also be used to consult broadly about data needs and reporting, a topic that we will discuss in Chapter 6.

[17] Although the RSCC has not met frequently, we understand that its large membership is considered to be a "stakeholder list," and is used for distribution of documents of interest by Transport Canada, Rail Safety.

[18] For example, when the Minister directs a railway company to formulate a rule, RSA s. 19(8).

We suggest that the renewed RSCC meet at least twice a year or perhaps more often at first, to develop a successful track record. It should have no more than 12 to 15 members covering all sectors – railway companies (including short lines) and their sector association, the Railway Association of Canada, unions, provinces, and the broader public interest, for example, Transport 2000. Each sector member should be responsible for sharing information and proposals with the wider sector that they represent. He or she should have an alternate, and also ensure continuity for the originating sector when membership rotates to another representative. Members should be encouraged to participate on behalf of their originating organizations or sectors. They should know what leeway they have to discuss and agree on specific issues, and should state when they have to seek approval from other members or authorities. This would apply also to government representatives.

The revived RSCC should be able to establish permanent technical committees or working groups to cover defined, specific issues. The existing, albeit inactive, RSCC has two working groups – one on Access Control Regulations, and the other on Grade Crossing Regulations. The RSCC itself, and any of its sub-groups, could call on outside experts, representatives of organizations, or other government departments, to provide information and advice on aspects of its work. The expert or organization concerned would not necessarily need to be a long-term member of the RSCC. This approach would allow a wider range of views to be available to the RSCC and its members without making its processes unwieldy.

Transport Canada uses two general types of consultative process. The first type is set up under regulations or orders, as provided by specific legislation. Examples include the Transportation of Dangerous Goods General Policy Advisory Council, and the related Federal-Provincial/Territorial Task Force on Transportation of Dangerous Goods,[19] the Canadian Aviation Regulation Advisory Council (CARAC),[20] and the Canadian Marine Advisory Council (CMAC).

The second has evolved informally over time without formal legislated obligations. Nonetheless, consultations of this type occur regularly, adhere to a work plan to achieve objectives and have proved to be successful. Transport Canada has various consultative mechanisms with the provinces and territories, which are not established by legislation. Examples include the Council of Ministers Responsible for Transportation and Highway Safety (meets once a year), the Council of Deputy Ministers (meets three times a year), and the ADM-level Policy and Planning

[19] Established by Minister's Order (under the *Transportation of Dangerous Goods Act 1992*, s. 26), setting out its general mandate and duties; both meet twice per year).

[20] *Canadian Aviation Regulations* (SOR/96-433), 103.01(2). Set up in 1993, CARAC's prime objective is to assess and recommend potential regulatory changes through cooperative rulemaking activities. It has participation from a large number of organizations outside Transport Canada representing the overall viewpoint of the aviation community.

Support Committee (meets three times a year face-to-face and holds monthly teleconferences).

The U.S. Federal Railroad Administration (FRA) uses the Railroad Safety Advisory Committee (RSAC), set up in 1996 with a mandate to develop consensus recommendations on safety issues.[21] Consideration by the RSAC is a required step in the U.S. FRA rule-making process (equivalent to development of a regulation in Canada). The RSAC includes representatives from all major groups interested in railway safety. The FRA seeks the RSAC's recommendations on specific tasks; on each task, the RSAC can decide whether or not to accept it and begin work. For tasks that it accepts, RSAC members appoint a working group of those most involved with the subject covered by the task. If the working group's recommendations are unanimously adopted by that group and by a majority of the full RSAC, they are sent to the FRA Administrator. While the FRA is free to accept or reject the RSAC's recommendations, it is fully engaged in the working group process to ensure that the recommendations are consistent with the FRA's goals for the rule-making project. As a result, the FRA's proposed and final rules that arise from RSAC recommendations usually incorporate those recommendations substantially.

The RSAC process is very formalized. It is chartered under federal legislation[22] that requires standards and uniform procedures to govern the establishment, operation, administration and duration of advisory committees for the executive branch of the U.S. government. The RSAC process is often criticized as somewhat cumbersome and time-consuming, but it is nonetheless used effectively by stakeholders to reach widely accepted solutions. We do not propose that the Transport Canada, Rail Safety Directorate adopt an elaborate consultation model, but some aspects of the RSAC's activities may be applicable to a revitalized RSCC.

We do not consider that it is necessary to revive the RSCC by legislative or regulatory amendment. The commitment to a transparent, accountable and regular process will build a record of success. In turn, this will build confidence and trust among all participants.

[21] Federal Railroad Administration website, http://www.fra.dot.gov/us/content/53; Silverstone, *Framework*, op. cit., paragraphs 234-247.

[22] *Federal Advisory Committee Act,* 5 U.S.C. App. 1, Public Law 92-463.

RECOMMENDATION 3

The Railway Safety Consultative Committee (RSCC) should be revived as a smaller and more focussed group. It should meet regularly for general information sharing and consensus building. It should serve as the key forum for discussion of:

- **future directions in rail safety, rule making and regulation;**
- **policy issues of concern to the regulator and the regulated community; and**
- **problems and issues of common concern, outside the formal rule-making process.**

A permanent secretariat should be set up in Transport Canada, Rail Safety Directorate to support the ongoing activities of the RSCC. The RSCC may be supported by specific working groups and technical committees.

3.4 WORKING WITH OTHER LEVELS OF GOVERNMENT

The restructuring and rationalization of railway companies since the early 1990s has led to the creation of many short line railways which, because they operate within a single province, fall within provincial jurisdiction. Appendix E provides an overview of the railways operating under provincial law. Short line railways generally have limited areas of operation (some operate on track belonging to the two main carriers, CP and CN), and serve targeted markets or specific industries. They can be very responsive to the needs of their local clients, but may not have extensive capital reserves, or management and workforces with a range of expertise. Such companies are an adaptive solution to market needs, and they call for flexibility and collaborative regulation.

Provinces with railways under their jurisdiction (i.e., all except Newfoundland and Labrador, and Prince Edward Island) have taken steps to create the legislation necessary to regulate railways and to link their regimes to the federal *Railway Safety Act*.

Three basic types of federal-provincial arrangements for regulating railway safety have emerged. These include incorporating federal legislation, regulations and rules, by reference, into provincial legislation; a "consultation model," whereby the provinces concerned decide on the manner in which their regulatory regimes will reflect the RSA; and a model that allows for federal services to be provided to provincial railways in keeping with the federal regulatory regime. These models and their application in different provinces are discussed in more detail in Chapter 4.

As part of ongoing efforts in this area, a Federal-Provincial Working Group on Railway Safety Regulations was established in 1994, by the Council of Deputy Ministers Responsible for Transportation and Highway Safety, to analyze existing

regulation of railways under their respective jurisdictions and identify gaps. Subsequently, under the Federal-Provincial Regulatory Regimes Harmonization Project, the Council of Deputy Ministers agreed to create joint databases on regulatory requirements and on accidents and incidents. It also established principles of federal-provincial consultation on regulations.

A Short Line Railways Task Force was established in 2004 under the Policy and Planning Support Committee of the Council of Deputy Ministers. It is primarily a provincial initiative, and a Transport Canada representative (from the department's Policy Group, not the Rail Safety Directorate) attends as an observer. Its initial mandate was to explore the capital, operating and regulatory problems facing short lines across the country and to develop an inventory of short lines. The Task Force also provides a forum for sharing experiences and for discussion between governments on a variety of issues surrounding short line railways, but it is not linked to any of the consultative processes in Transport Canada, Rail Safety.

It is clear that all elements of the Canada *Railway Safety Act*, its provisions, regulations and rules, are of critical significance to the provinces. This is the case whether or not a province has established its own fully stand-alone regulatory regime, and whether it has its own compliance officers or has an agreement with Transport Canada to use railway safety inspectors. It is essential, therefore, that the needs and concerns of provincial regulators are taken adequately into account and addressed by Transport Canada.

Under the current framework, Alberta has little or no opportunity to influence RSA rules or regulations to address issues that concern Albertans. We are pressed to harmonize with a system that is structurally distant and exclusive, notwithstanding real long standing concerns that have arisen over time.
Province of Alberta Submission, page 2.

Manitoba considers that there is still a fairly uneven process of consultation and communication from the federal government with respect to regulation and rule development. … Manitoba recommends that some mechanism is required to involve jurisdictions that will have to apply the regulations and rules to their constituent railways earlier on in the process.
Manitoba Infrastructure and Transportation Submission, page 2.

New Brunswick has adopted federal rules, regulations, standards and procedures under the New Brunswick *Shortline Railways Act* and therefore changes to these federal rules, regulations, standards and procedures may have a significant impact on railway operations in the province. The ability to have input into proposed changes is critical to maintaining a harmonized regulatory regime.
New Brunswick Department of Transportation Submission, page 16.

Nova Scotia feels that the consultation process has been at best sporadic and at times limited to a notification process rather than a consultative process.
Government of Nova Scotia Submission, page 4.

We learned that the provinces affected are generally satisfied with the current regulatory approach. It reflects the variety of economic needs and priorities across Canada, and accommodates other provincial and municipal responsibilities, such as emergency and environmental response, and safety regulation for other sectors. Some expressed disappointment, however, at the way specific arrangements had worked out, and were concerned that Transport Canada, Rail Safety Directorate is not paying enough attention to provincial concerns and points of view. We have come to the conclusion that it is not necessary to seek further harmonization of railway safety through changes in federal-provincial arrangements, but to make the existing arrangements work more effectively.

Most provinces seek a considerably more open and consultative approach to rule making. They mentioned to us that there was no consultation or even advance notice about matters that can have major financial and other implications for provinces, railways under their jurisdiction and affected municipalities. They do not consider it adequate simply to be informed after the fact that new or amended rules have been approved.

Transport Canada, Rail Safety Directorate must develop a process for notifying the provinces of possible changes that could affect them. It must invite input to the consultative process according to the regulatory framework that applies to affected provinces. This process should not cause unnecessary delay because of inaction by the provinces (e.g., by providing that if no comment is received from provinces within a specified period, the proposal will proceed to next stage). Finally, the provinces must be notified of the result.

Transport Canada and the provinces should make more effective use of the Federal-Provincial Working Group on Railway Safety (FPWGRS). This group is the re-named Federal-Provincial Working Group on Railway Safety Regulations that was set up in 1994. It last met in November 2006, and before that once in 2003, and three times in 2001. It is chaired by the Director General, Rail Safety, Transport Canada, and includes representatives from the provinces designated by the Council of Deputy Ministers, and representatives of Transport Canada regions (Surface). The FPWGRS could be part of the solution to a more consultative relationship on matters of policy and rule making, and should be involved in more issues and at an earlier stage. It is an instrument of the Council of Deputy Ministers, and therefore can report to them on issues that may affect other parts of their mandate (such as highway safety). It is also part of Transport Canada's national framework of railway safety, and can be directly involved with emerging and ongoing policy issues at all stages.

We have suggested that the revived Railway Safety Consultative Committee, described above, should have a member representing provinces. Provincial participation in the RSCC would also provide an important understanding of the issues and challenges facing the wider railway safety community. This member could be

a link to share information and proposals between the federal-provincial-territorial consultations and the revived RSCC.

The key is that Transport Canada must listen to provincial concerns and address them cooperatively and openly.

RECOMMENDATION 4

Transport Canada should institute the practice of regular consultation with concerned provinces on all matters to do with railway safety affecting provincially regulated railways. The Federal-Provincial Working Group on Railway Safety should be used more deliberately as an information sharing and consultative forum.

3.4.1 Agreements

Several provinces have entered into agreements or memoranda of understanding with Transport Canada, in particular to obtain inspection and other services under their safety framework from railway safety inspectors designated under the *Railway Safety Act* (Canada). The legislative authority for such agreements lies not in the RSA itself, but in the *Canada Transportation Act*,[23] in the part dealing *inter alia* with powers of the Canadian Transportation Agency (CTA) in relation to railway transportation. Such agreements fall under the general headings of "Agreements to apply transportation law to provincial railways," and other agreements made with provincial authorities. However, these agreements apply to matters otherwise governed by the *Railway Safety Act*, such as railway safety; accident investigation and railway crossings; railway noise; and construction, operation and safety of a railway.

We see no reason why the railway safety aspects of such agreements should not be addressed by a power under the *Railway Safety Act* itself. Indeed, we consider that it would add clarity and transparency to the national framework for railway safety. We note that section 6 of the RSA allows the Minister to enter into agreements with the CTA to provide for coordination of activities between Transport Canada and the Agency.

We have also learned that Transport Canada, Rail Safety Directorate has had an active relationship with the U.S. FRA for many years. Formal and informal meetings are held between the two organizations to cooperate on issues of common concern regarding the regulatory oversight of their respective railway industries, for example, on new railway safety technologies, and harmonization of safety requirements to facilitate cross-border traffic. The relationship has developed without any express provisions to this effect in the *Railway Safety Act*.

[23] *Canada Transportation Act* (1996, c. 10), ss. 157.1, 158.

We consider that it could be beneficial for Transport Canada to be able to develop agreements with foreign governments, such as that of the United States, concerning railway safety. This would allow Transport Canada to maximize and secure the benefits of international cooperation initiatives, such as sharing of information and mutual recognition of safety standards, by means of reciprocal agreements. There are also foreign and international organizations (for example, standards-setting bodies like the International Organization for Standardization (ISO), and standards bodies in specific countries) with which Transport Canada may wish to develop agreements or understandings.

RECOMMENDATION 5

The *Railway Safety Act* should be amended to authorize the Minister to enter into agreements with provincial governments or foreign governments or any international organization with respect to all matters relating to railway safety and security.

Over and above the processes and systems that are put in place, effective functioning of the RSA requires the collaboration and participation of interested parties. Other participants must feel confident that they can all work together successfully.

CHAPTER 4
REGULATORY FRAMEWORK

The regulatory framework for railway safety encompasses the federal and provincial legislation, regulations, rules, and standards that provide the structure in which railway companies can operate safely. Some 34 Canadian railways[1] have interprovincial or Canada-U.S. operations and are therefore regulated by federal law. These include the two major freight-carrying railways, CN and CP,[2] the passenger rail company VIA Rail, and more than 30 short line companies. Another 62 railways[3] (excluding industrial lines) operate entirely within a single province and are, therefore, regulated by provincial governments.

4.1 FEDERAL LEGISLATION AFFECTING RAILWAY SAFETY

Several federal statutes play a role in the regulation of railways, the most important of which is the *Railway Safety Act*, together with the regulations and rules made pursuant to it. Other federal legislation affecting railway safety includes: the *Transportation of Dangerous Goods Act*, the *Canadian Transportation Accident Investigation and Safety Board Act*, the *Canada Labour Code* and the *Canada Transportation Act*.

The ***Railway Safety Act*** (RSA), which came into force in 1989, gave responsibility to Transport Canada for overseeing railway safety. It separated this role from those of the Canadian Transportation Agency (for economic regulation and dispute resolution) and the Transportation Safety Board (for accident investigations).

The basic principle introduced by the RSA was that railway companies must be responsible and accountable for the safety of their own operations, while the regulator must retain the power to protect people, property and the environment by ensuring that the railways operate safely within a national framework. The Act reinforces this principle by providing for government regulations and rules, as well as the development of operating rules and engineering standards by the industry that can be legally recognized as equivalent to regulations through approval by the Minister of Transport. Rules and engineering standards may be adapted to the needs of different railways and may be developed more quickly than regulations.

The RSA sets out the parameters for regulations and rules as follows. The Governor in Council (GIC) has the power to make regulations with respect to all matters under

[1] See Appendix E.

[2] Categorized as "Class 1" in the United States.

[3] See Appendix E.

the Act (see section 47). The GIC has *exclusive* regulation-making powers over all aspects of crossing safety, for example, construction of crossings, preventing access to railway land by means of fences, signs or other means, and controlling automobile and pedestrian traffic on road approaches to railway crossings. Similarly, the government has *exclusive* regulation-making powers in the areas of the construction, alteration or maintenance of buildings, drainage systems or other structures on non-railway land; the control of "any other activity . . . that could constitute a threat to safe rail operations" on land adjoining railways; and the removal of vegetation and other hindrances to clear vision of a road or line of railway.[4] Finally, the Governor in Council has *exclusive* powers to adopt regulations with respect to safety management systems (SMS).[5] Regulations under the RSA are developed by Transport Canada and presented by the Minister of Transport to Cabinet for approval, under a formal process that includes publication in the *Canada Gazette* and public consultation, before being adopted by the Governor in Council.

Other matters may be the subject of either government regulations or engineering standards or rules. For example, section 7 of the *Railway Safety Act* authorizes three methods for developing engineering standards for the construction or alteration of railway works. The Governor in Council may make regulations defining engineering standards, or the Minister of Transport may order a railway company to formulate engineering standards for these works, or a railway company may develop engineering standards on its own initiative. Engineering standards developed by the industry are subject to the approval of the Minister.

Part II of the Act, which deals with the operation and maintenance of railways, provides for the development of regulations, railway-initiated rules and Minister-mandated rules on a wide range of subjects. Rules may be drafted by railways or by the government, but must always be approved by the Minister. The Minister may also exempt individual railways from the requirements of a rule.[6] Matters under Part II that can be the subject of rules or regulations include: maintenance of line works; railway equipment; security; training of personnel; and designation of safety-critical positions.

Rules differ from regulations in two important respects. Firstly, a rule applies only to those railways that sign on to it, whereas regulations have general application. Secondly, rules and engineering standards require only the approval of the Minister of Transport, whereas regulations require adoption by the Governor in Council. Nevertheless, once approved by the Minister, rules have the same force and effect

[4] *Railway Safety Act* (1985, c. 32 (4th Supp.)), ss. 18(2) and 24(1).

[5] RSA, s. 47.1(1).

[6] RSA, ss. 18-22.

as regulations. Regulations take precedence over rules, and the government can make regulations that supersede rules at any time.

Amendments made to the *Railway Safety Act* in 1999 added the objective of environmental protection to the Act, strengthened the requirements for industry to consult with relevant organizations in the process of developing new rules and imposed a requirement to consult prior to applying for an exemption from a rule. At the same time, provisions were added to the Act requiring railways to implement safety management systems. As part of this change, the primary emphasis of Transport Canada in relation to compliance monitoring was intended to shift from detailed technical inspections for compliance, to auditing the implementation of company safety management systems.

The ***Transportation of Dangerous Goods Act*** (TDG Act) sets out specific requirements governing the handling and transport of dangerous goods, including transportation of such goods by rail. The TDG Act provides a framework for *prevention* of incidents and spills involving dangerous goods, and for appropriate response in the event of such an incident. The framework for emergency preparedness and response is discussed further in Chapter 8.

The ***Canadian Transportation Accident Investigation and Safety Board Act*** deals with accident and incident reporting and investigation for all modes of transport under federal jurisdiction, including rail.

The ***Canada Labour Code*** deals with on-the-job occupational health and safety of workers in federally regulated workplaces, including railways under federal jurisdiction.[7] The occupational health and safety provisions of Part II of the Code are reinforced by the principles that all employees have the right to refuse dangerous work. Every employer is required to establish a workplace health and safety committee for each workplace (controlled by that employer) that has 20 or more employees. The Code also requires employers to appoint a health and safety representative for each workplace with fewer than 20 employees. The committees are responsible for health and safety matters that apply to individual workplaces.

The ***Canada Transportation Act*** provides an overall economic framework for the national transportation system that is "competitive, economic and efficient" and "meets the highest practicable safety and security standards."[8] It came into effect in 1996, replacing *inter alia* the *National Transportation Act*, the *Government Railways*

[7] For on-board employees, Part II of the *Canada Labour Code* and the *On Board Train Occupational Health and Safety Regulations* are delegated to Transport Canada, Rail Safety for enforcement, under a Memorandum of Understanding between the two departments. Human Resources and Social Development Canada (Labour Program) enforces Part II of the Code and the *Canada Occupational Health and Safety Regulations* for so-called "off-board" employees, such as those performing track maintenance and car and locomotive repairs.

[8] *Canada Transportation Act* (1996, c. 10), s. 5.

Act and elements of the *Railway Act*, and it established the Canadian Transportation Agency (CTA).

References in the *Railway Safety Act* to the definition of a "railway company" in the *Canada Transportation Act* have the effect of limiting the application of the RSA to companies holding a Certificate of Fitness issued by the CTA. This creates a potential jurisdictional gap, which is discussed later in the chapter.

4.2 PROVINCIAL RAILWAY SAFETY LEGISLATION

As discussed in Chapter 3, the role of provincial governments in regulating railway safety has increased in importance since the creation of many short line railways in the 1990s. We have already commented on how this increases the importance of maintaining collaborative working relations between the federal and provincial governments.

Differences in regulation and enforcement among provinces, and between the provincial and federal regimes are inevitable. Most provinces, including British Columbia, Alberta, Manitoba, Nova Scotia and New Brunswick, have incorporated by reference into their own legislation, some or all of the provisions of the *Railway Safety Act*, regulations and rules, thus ensuring that the same rules apply to provincial railways.

The *Ontario Shortline Railways Act* enables the adoption of federal legislative provisions, regulations and rules through a provincial agreement with the federal government. As a result, the Ontario railway safety regime most closely resembles the federal regime. Ontario and Manitoba automatically adopt changes to the applicable federal rules and regulations. In other provinces, this may be done on a case-by-case basis when amendments are made at the federal level.

A concern was raised with the Panel that although provincial railways can be bound by RSA rules, they are not able to apply for exemptions from the rules. This is a matter for provincial governments to address. We note that the Ontario government has adopted a regime that allows its provincial railways to apply for exemptions from rules. This provides a model that other provinces could consider.

NB Southern Railway, Saint John, New Brunswick, July 2007

Saskatchewan and Quebec have taken a different approach by developing their own legislation without reference to the federal *Railway Safety Act*. These provinces operate on a consultation model, under which they choose the manner in which the various provisions of their own safety regimes will reflect the RSA system. For example, Saskatchewan uses a combination of powers in its Act and guidelines to regulate its provincial railways. The Saskatchewan legislation is more performance-based than the federal RSA and does not provide for industry rule making.

Most provinces with provincially regulated railways also have a memorandum of understanding (MOU) with Transport Canada under which federal railway safety inspectors provide inspection services to the province on a cost-recovery basis.[9] The terms of these MOUs and the extent to which each province uses the services of federal railway inspectors vary from one jurisdiction to another. Federal inspectors apply the rules and regulations adopted by each province when inspecting provincial railways, but generally do not have enforcement powers. In most provinces, provincial enforcement officers carry out enforcement.[10] British Columbia is an exception, performing its own inspections and enforcement activities.

British Columbia has adopted its own requirements for safety management systems in its legislation, and performs its own audits. Federal-provincial MOUs between Transport Canada and the provinces of Ontario, New Brunswick and Nova Scotia result in the provincial railways in these provinces being subject to the federal *Railway Safety Management System Regulations*. These provinces, however, perform their own SMS audits.

4.3 RAILWAY SAFETY ACT ISSUES

In our review and consideration of the Act, we found that while its general principles are fundamentally sound, a number of improvements could be implemented.

4.3.1 Objectives of the *Railway Safety Act*

As amended in 1999, section 3 of the *Railway Safety Act* sets out the following objectives:

> 3. The objectives of this Act are to

[9] Transport Canada recovers the costs of the services of railway safety inspectors under the various agreements. We learned that some or all of these costs are invoiced directly from the railways being inspected; see submission of Huron Central Railway Inc. (August 2007); Ministry of Transportation of Ontario, *Submission to Railway Safety Act Review Panel* (August 2007) page 3.

[10] A federal-provincial agreement under the Ontario *Shortline Railways Act* (1995) specifies that federal services will be provided in accordance with the federal regulatory regime, and permits Transport Canada to inspect the railways under Ontario jurisdiction and take most enforcement actions directly (see Ontario, *Submission*, op. cit., pages 2-3). The Ontario Northland Railway (ONR) is an exception; it is essentially self-regulating (ibid., page 8).

a) promote and provide for the safety of the public and personnel, and the protection of property and the environment, in the operation of railways;

b) encourage the collaboration and participation of interested parties in improving railway safety;

c) recognize the responsibility of railway companies in ensuring the safety of their operations; and

d) facilitate a modern, flexible and efficient regulatory scheme that will ensure the continuing enhancement of railway safety.

Section 4 of the Act further clarifies:

> 4. (4) In determining, for the purposes of this Act, whether railway operations are safe railway operations, or whether an act or thing constitutes a threat to safe railway operations or enhances the safety of railway operations, regard shall be had not only to the safety of persons and property transported by railways but also to the safety of other persons and other property.

The purpose of the Act, therefore, is to protect people, property and the environment from potential harm caused by the operation of railways. The *Railway Safety Act*, together with the *Canada Transportation Act,* also provides a framework to address safety concerns for people and property in close proximity to railway operations.

The 1999 amendments to the *Railway Safety Act* added "protection of the environment" to the list of safety objectives in section 3(a), and several other sections in the Act elaborate on this objective.[11] Through these amendments to the RSA, Transport Canada has been given the responsibility for protecting the environment from the effects of emissions and spills of environmentally hazardous products from trains. It is important for Transport Canada to fulfill the environmental objective set out in the Act by holding the railway industry accountable for its environmental performance.

It is also clear in section 3 that Parliament intended Transport Canada and the industry to collaborate with one another and with other interested parties in improving railway safety. Another objective in section 3 is to facilitate a regulatory regime that is "modern, flexible and efficient" in order to ensure the continuing enhancement of railway safety. The objective of continuous improvement, so clearly articulated in sections 3(b) and (d) of the Act, is consistent with the inclusion in 1999 of authority to develop *Safety Management Systems Regulations* and, in our view, should be the central focus of all actions taken by the regulator and the industry under the *Railway Safety Act.*

[11] See RSA ss. 4(4.1), 24(1)(e), and 47.1(2)

> ...accidents are an inevitable part of the work of a far-flung transportation operation like CN, but ...[CN's] overall safety record has improved.
>
> CN spokesperson cited in Ian Bailey, "Third CN derailment revives Opposition calls for safety record inquiry," *The Globe and Mail*, September 18, 2007

Safety management systems are intended to continuously reduce safety risks to a level as low as reasonably practicable, and this objective should be articulated in section 3 of the Act. The objective of continuous improvement should also be the central focus of the *SMS Regulations*, and performance reporting should be directed to this end.

These are necessary first steps to improving the safety culture of the railway industry. We noted during the course of the Review that railway accidents continue to occur frequently. Railway companies still sometimes take the position that accidents are an inevitable part of the railway business. In our opinion, accidents should not be viewed in this manner and should never be accepted as such by the government or the railways themselves.

By focussing on the objective of continuous improvement and managing safety through safety management system plans that are filed with, and professionally audited by, Transport Canada, the government can ensure that railway companies systematically assess and manage risks to achieve the best possible safety performance. We recommend, therefore, that section 3 of the *Railway Safety Act* be amended to reflect the objective of continuous improvement and the central importance of company safety management plans in planning and reporting on safety performance.

RECOMMENDATION 6

Section 3(c) of the *Railway Safety Act* should be amended to read:

"The objectives of this Act are to …

(c) recognize the responsibility of railway companies *to demonstrate, through their safety management systems, that they continuously manage their safety risks to a level as low as reasonably practicable."*

4.3.2 Application of the *Railway Safety Act*

Two sections in the RSA link it to the *Canada Transportation Act*. Section 2(2) provides that the RSA "applies in respect of transport by railways to which Part III of the *Canada Transportation Act* applies." Section 4(2) states that if the RSA does not contain a definition of a term, the definitions set out in the *Canada Transportation Act* are to be used. Although the term "railway company" is used frequently in the *Railway Safety Act*, there is no definition of "railway company" in the RSA itself. The

Canada Transportation Act defines a "railway company" as a company that has been issued a Certificate of Fitness (COF) by the Canadian Transportation Agency.[12]

The CTA, an independent agency at arm's length from the Minister of Transport, issues a Certificate of Fitness when it is satisfied that a company proposing to construct or operate a railway under federal jurisdiction has adequate liability insurance. Certified companies are monitored by the CTA for continued compliance with this economic criterion.

Transport Canada's jurisdiction depends on whether or not a company has been granted a Certificate of Fitness by the CTA. Historically, the CTA has been reactive – responding to a company when it applied for a COF, rather than actively investigating to ensure that an application was forthcoming. This is seen as a jurisdictional gap and has resulted in five railway companies which do not have a federal COF or a provincial operating licence.[13]

Jurisdiction is further complicated by the fact that many provincial railways run over federal railway lines owned by CN or CP. By contractual agreement with the owners of the track, the provincial railway is obliged to follow federal operating rules while running on federal track. Transport Canada does not take direct enforcement action against the provincial railway, however, if safety provisions are violated. Rather, the department brings any enforcement action against the track owners (that is, CN or CP), holding them responsible for the actions of the railway using their track. This awkward enforcement practice does not provide for optimal accountability and transparency and may become more problematic if additional enforcement powers, such as administrative monetary penalties, are added to the *Railway Safety Act*, as we recommend below.

We believe that application of the *Railway Safety Act* should occupy the full scope of federal jurisdiction. This would have the effect of applying RSA rules and regulations (e.g., those governing speed) to all railways operating on federal track.

To resolve the problem of possible gaps in jurisdiction, the application of the *Railway Safety Act* should be established within the RSA itself, relying on the principles set out in sections 91 and 92 of the *Constitution Act 1867*. This is the normal practice for federal statutes, and is the case for the *Transportation of Dangerous Goods Act*, the *Canadian Transportation Accident Investigation Safety Board Act*, and the *Canada Labour Code*; that is, these statutes do not refer to the Certificate of Fitness as a criterion for their provisions to apply.

[12] *Canada Transportation Act*, ss. 87, and 90-94.

[13] See Deana Silverstone, *The Legislative and Institutional Framework for Railway Safety in Canada* (July 2007), paragraph 10.

RECOMMENDATION 7

Section 2(2) of the *Railway Safety Act* should be amended to provide that the Act applies in respect of all matters of railway safety and security under the legislative authority of Parliament.

When jurisdiction is established directly in the *Railway Safety Act*, it will also be necessary to include a definition of "railway company" in the Act, so that it will no longer be necessary to refer to the *Canada Transportation Act***.** Most elements of the RSA apply to "railway companies," and the Act refers to this term throughout. The new definition of "railway company" for the purposes of the *Railway Safety Act* should include in its scope all entities to which its objectives are intended to apply.

RECOMMENDATION 8

A definition of "railway company" should be included in the *Railway Safety Act.*

4.3.3 Baseline Requirements for Operation

A new railway company is authorized to begin operations when the Canadian Transportation Agency (CTA) issues a Certificate of Fitness (COF). The COF simply indicates that the railway is under federal jurisdiction, has sufficient financial capacity to operate, and has obtained appropriate insurance coverage. This is in keeping with the economic mandate of the CTA.

The *Railway Safety Act* imposes two baseline safety requirements on a new railway company (through the *SMS Regulations*). The company must submit specified information in respect of its safety management system, and it must comply with all railway safety regulations in force at the time. In practice, these are pre-conditions to the issuance of the COF, and we understand that the CTA keeps the Transport Canada, Rail Safety Directorate informed of possible new entrants who are applying for a COF.

The *SMS Regulations* under the *Railway Safety Act* require that a new railway operator submit its safety management system information at least 60 days before operations begin.[14] Transport Canada reviews the information to ensure that it contains all of the required elements, but does not approve the SMS in terms of its effectiveness. Transport Canada does not undertake an inspection to verify the safety capacity of the company before the COF is issued. In fact, Transport Canada normally does not examine the SMS in depth until an SMS audit is done, which may be several years later.

[14] *Railway Safety Management System Regulations* (SOR/2001-37), s. 4(2)(b).

A new railway company, including a new entity that is created as a result of a merger or other corporate restructuring, must also comply with railway safety regulations in force and with rules to which the new company will be a signatory. A start-up inspection should be undertaken to verify its capacity to comply.

We note that a number of provinces require operating permits or licences for railways under their jurisdiction.[15] This approach could serve as a model for federal railway companies. Similarly, an Air Operator Certificate is required from Transport Canada to operate an air transport service. The civil aviation sector in Canada is regulated, under the *Aeronautics Act*, through a system of "Canadian aviation documents," such as Air Operator Certificates, Certificates of Registration, Certificates of Airworthiness, flight crew licences and permits, which are granted (and may be suspended or cancelled) according to prescribed procedures.

In our view, Transport Canada should establish baseline safety requirements by regulation, and complete a comprehensive safety inspection of every new railway company before it begins operation, to determine whether it complies with the regulatory framework. Once satisfied that the railway company has met an acceptable level of safety, Transport Canada should issue a Rail Operating Certificate (ROC). A Rail Operating Certificate would be required in addition to the Certificate of Fitness (COF) issued by the Canadian Transportation Agency, and should be a precondition to obtaining the COF.

The ROC could also be suspended or cancelled on safety grounds, as is the case in civil aviation. Although this would be a remedy of last resort, it would provide an important additional enforcement tool for Transport Canada in the rail transportation mode. Canadians expect the regulator to have the power to shut down unsafe operations, when other enforcement approaches fail. Any decision to suspend or cancel an operating certificate should be taken at senior levels, with the direct involvement of the Minister. The holder of an ROC should have the right to seek redress for a decision to suspend or cancel the certificate, including review by the Transportation Appeal Tribunal of Canada (TATC), with procedures analogous to those available for Canadian aviation documents.

The requirement for a Rail Operating Certificate should apply to all railways under federal jurisdiction, including existing ones. A "grandfathering" provision should be adopted that would automatically grant an ROC to a railway company that already meets the existing requirements (that is, for a COF only) on the date the new provision comes into effect. Nonetheless, a Rail Operating Certificate issued to

[15] For example, in British Columbia, new companies must obtain an operating permit from the registrar of railway safety prior to commencing operations; in Manitoba, a new entity must obtain a Licence to Operate from the Motor Transport Board, which requires proof of liability insurance, and a certificate from a qualified engineer that the applicant complies with railway safety requirements, *The Provincial Railways Act* (C.C.S.M. c. R15) s. 30; and *Provincial Railways Fitness Criteria and Safety Regulation*.

any company, whether new or long-established, could be suspended or cancelled on safety grounds as described above.

RECOMMENDATION 9

A railway should be required to obtain a Rail Operating Certificate (ROC) as a precondition to obtaining a Certificate of Fitness (from the Canadian Transportation Agency) and to commencing or continuing operations. Transport Canada will issue the ROC when satisfied that the railway meets baseline safety requirements determined by regulation. Existing companies would automatically be issued the ROC. Transport Canada would have the power to suspend and/or cancel the ROC if the company fails to meet baseline safety requirements.

4.3.4 Rules and Regulations

As outlined in the introduction to this chapter, the *Railway Safety Act* provides for detailed safety requirements to be developed by the government in the form of regulations, or developed by the industry in the form of rules, and submitted to the Minister of Transport for approval.

Most stakeholders acknowledge that the use of a system of rules, rather than more formally created regulations, offers flexibility and efficiency. It takes advantage of the experience and expertise of the railway companies and other participants in the rule-making process.

Those who favour industry-initiated rule making see it as the key element of a more modern, realistic and effective approach to railway safety. They argue that only the industry itself (management in cooperation with its employees) can bring about safe operations, and that industry rule making dovetails with the philosophy of safety management systems (SMS) because it has the potential to reflect the expert knowledge and interests of those most directly concerned with rail safety.[16] Although significant issues have arisen from time to time in rule-making projects, in our view, the rule-making provisions of the Act are fundamentally sound and should be retained.

Some presentations to the Panel expressed concern that the development of proposed rules by the industry amounts to "self-regulation." With respect, we disagree. We believe that rule development within the industry is more accurately described as a form of "co-regulation" or collaboration, rather than "self-regulation."

[16] See James Mitchell and Nigel Chippindale, Sussex Circle Inc., *The Governance of Railway Safety in Canada* (September 2007), section 5-B; Harvey Sims, Sussex Circle Inc., *The Development of Work/ Rest Rules for Railway Operating Employees: A Case Study Prepared for the Railway Safety Act Review Panel* (August 2007).

The rule-making structure of the RSA provides that the Minister has ultimate authority to approve or reject industry proposals on the grounds that they are or are not conducive to safe railway operations.[17] The overall framework of the Act contemplates final ministerial or government approval of safety requirements, whether these requirements are in the form of rules originated by railway companies or by government, regulations, engineering or other standards, orders (by RSIs or the Minister's delegate) or Minister's directives. Moreover, whether initiated by the industry or government, once approved, all rules have the force of law, and Transport Canada has broad powers to require a rule, a rule change, or development of its own regulation over the subject matter.[18]

There were, at the time of writing, 18 safety-related regulations under the *Railway Safety* and *Transportation of Dangerous Goods* acts applying to railways, and 16 rules. In four cases, the Minister directed the development of the rule; otherwise the industry initiated their development. There are also engineering standards developed by the railway industry and approved by Transport Canada.

There is no guidance in the Act as to the circumstances in which a safety issue should be the subject of a rule developed by the industry (subject to approval by the Minister) or a regulation developed by the government. Although the Act permits an initiative to develop rules for all of the subjects outlined above, in some circumstances, regulations may be more appropriate. A key consideration is the impact on third parties of the measures being considered. Where this impact would be significant, it is appropriate for the government to lead the work in the form of developing a regulation, which requires much broader consultation and public notice. Transport Canada should set out clear principles to determine what types of railway safety issues are most appropriately addressed by rules and what types should be addressed by regulations.

The process for making regulations, which applies across federal statutory authorities, is intended to be more responsive and flexible than the process for amending legislation and has been greatly streamlined in recent years.[19] Nonetheless, it has many formal requirements and the process can be long and costly. The process is governed by the *Statutory Instruments Act*, which sets out requirements for examination of the proposal (including review by Justice Department drafting experts), consultations, publication across Canada, review by Cabinet, and final publication and promulgation. The draft proposal must be accompanied by a formal Regulatory Impact Analysis Statement (RIAS) that describes the potential impacts of the

[17] RSA, ss. 19(4), 20(4).

[18] See Silverstone, *Framework*, op. cit., paragraph 138.

[19] Treasury Board of Canada, *Cabinet Directive on Streamlining Regulation* (April 2007); Treasury Board of Canada, *Assessing, Selecting, and Implementing Instruments for Government Action* (August 2007).

proposal, overall costs, options considered and the degree of contention and support among affected parties and Canadians. When the interests of many parties must be considered, it is often a challenge in terms of developing a regulation that represents a balance of viewpoints, and managing the consultation process. This is the case, for example, with the *Grade Crossing Regulations*, which involve industry, municipalities, the general public, and provincial and federal governments.

We agree that the use of rules – with the improvements we recommend below – remains appropriate for many aspects of railway safety in which third parties are not affected and a more limited consultation process is adequate. We also recommend that regulations be used in other areas, where a proposal cannot be adopted without the participation of many parties.

4.3.5 Strengthening the Rule-Making Process

Throughout our consultation process, everyone involved – the railway industry, provincial governments, unions, other stakeholders and Transport Canada – expressed concerns about how rule development is functioning in practice.[20] We concluded that the current problems in the development of rules are mainly lack of clarity and the fact that working relationships among partners in the process (i.e., Transport Canada, Rail Safety and the industry) have broken down. These relationships need to be re-established on a more constructive and collaborative basis.

The development of the *Work/Rest Rules for Rail Operating Employees* is a particularly problematic example.[21] The project began in 1993, as a direct result of the Hinton train crash of 1986, with the objective of developing a rule setting out the maximum hours of work for railway operating employees.

The industry and the Brotherhood of Locomotive Engineers (BLE)[22] began by working together on a major study on the science of work, rest and fatigue – the CANALERT '95 study. CN and CP paid for the study. By 2001, a working group composed of the industry, the BLE and Transport Canada, Rail Safety had developed draft *Work/Rest Rules for Rail Operating Employees* and an interpretation document, known as *Circular 14 – Recommended Procedures and Practices for the Application of Work/Rest Rules*. Very little of the advice provided in the CANALERT '95 study had found its way into the draft rules.

[20] As noted in Silverstone, *Framework*, op. cit.; Mitchell and Chippindale, Sussex Circle, *Governance*, op. cit.; and, Sims, Sussex Circle, *Work/ Rest Rules Case Study*, op. cit.

[21] Sims, Sussex Circle, *Work/ Rest Rules Case Study*, op cit, paragraphs 79-205.

[22] The other major union – United Transportation Union – opted out of the process. The union later raised objections to the final product.

The draft *Work/Rest Rules* were presented to the Railway Safety Consultative Committee, and they were met with criticism from some of committee members. Transport Canada then engaged an expert to review the proposed rules and hosted a workshop with stakeholders to resolve the outstanding issues. As a result of the workshop, the department asked for certain improvements in the fatigue management plans that were considered central to the proposed approach. We understand that Transport Canada, Rail Safety officials became increasingly concerned at this time that situations could arise in which train crews could work very long hours or be obliged to return to duty without having had sufficient rest. Nevertheless, in 2002, they approved the rules that were to come into effect in April 2003.

During information sessions in the spring of 2003, it became evident that there were significant differences between Transport Canada and the industry in the interpretation of these new rules. Having reviewed the 2003 version of the *Work/Rest Rules*, we concluded that the document was so poorly drafted that many interpretations were possible. It is regrettable regulatory practice to have such ambiguity in a document that will have the force of law.

As soon as the *Work/Rest Rules* came into effect, Transport Canada began to receive complaints from the industry about interpretations of the rules by railway safety inspectors, and from railway employees about how the rules were being implemented by their employers. Transport Canada, Rail Safety Directorate again reviewed the situation and concluded that there were valid concerns with the interpretation of these rules.

We share Transport Canada's reservations about the content of these rules. On the other hand, we are also sympathetic to the industry's perspective that, once Transport Canada, Rail Safety officials had assessed these rules and totally rejected the revisions, this compounded the problem. For example, in December 2003, apparently frustrated with industry's response to their new concerns, Transport Canada officials rejected an entire package of revisions, later acknowledging that there were some elements they could have accepted. Officials gave their reasoning for rejecting certain clauses but did not provide the documents on which their reasoning was based. Revised *Work/Rest Rules for Rail Operating Employees* were finally approved in June 2005.

After 12 years of effort to develop minimum work and rest provisions for operating employees of railways, the result is *Work/Rest Rules* that do not correspond to current expert advice on the subject and a loss of mutual trust and respect between the regulator and the industry.[23] There is a pressing need for Transport Canada and the

[23] Sims, Sussex Circle, *Work/Rest Rules Case Study*, op cit, paragraph 199; Maury Hill and Associates, Inc., *A Study of the Role of Human Factors in Railway Occurrences and Possible Mitigation Strategies* (August 2007), section 4, "Work/Rest Rules."

industry to re-establish effective working relationships on rule making and a range of other issues. We believe that the department must take the initiative in this process.

Some stakeholders told us that, in recent years, Transport Canada has used the rule-making provisions of the RSA in a way that the stakeholders consider inappropriate. They assert that by imposing conditions on the approval of industry-initiated rules and by closely specifying the desired outcome when requiring the development of rules by the industry, Transport Canada is sometimes steering the development of rules to an unreasonable extent and thereby distorting the process.[24]

To address concerns about whether the department is likely to propose, in the end, that the Minister approve a given rule, Transport Canada should be engaged throughout each rule-making project, by assigning to the working team a qualified officer who has a mandate to speak on behalf of the department. There should be a process for this employee to verify the continuing support of the department as the work progresses. Any concerns that the department has about the proposal should be raised as early as possible, so that differences can be resolved before the package is submitted to the Minister for approval. There should be no surprises at the approval stage of the process.

For its part, the railway industry should listen carefully to the input of the department and attempt to resolve any differences of opinion before submitting the proposed rule for approval by the Minister. Transport Canada has an essential responsibility to represent the interests of the general public in this process. In their submissions, many members of the public underlined to the Panel their expectation that the department will fully discharge this responsibility.

In recent years, Transport Canada has imposed conditions more frequently on new rules and exemptions. A better approach would be for Transport Canada, Rail Safety Directorate to work with the industry on the development of the rule, raise any concerns early in the drafting process, seek to address these concerns in the text of the rule itself, and to do so prior to submission of the proposed rule for approval by the Minister. This would provide the industry with ample notice of the department's position and avoid surprises at the approval stage. Conditions should be imposed as a last resort, when the department and the industry cannot come to a consensus on the rule. If conditions are to be used, a consolidated version should be published which integrates the conditions with the rule.

A key issue for the rule-making process will be for Transport Canada to provide the rationale for its decisions to the industry and other stakeholders. Transport Canada's decision-making process should be – and should be seen to be – more open and evidence-based. The information and analysis that support decisions on rules

[24] Mitchell and Chippindale, Sussex Circle, *Governance*, op. cit., section 5-B.

should be available to those who might wish to comment, as it must be when regulations are under consideration. Also, the rationale behind the decision should be made more explicit or Transport Canada could be vulnerable to suggestions of using either an inadequately evidence-based process, or inappropriate criteria.[25] Industry should also provide a rationale for its draft rules, addressing and documenting the analysis, including net benefits and alternatives considered, of proposed rules that they initiate. This will contribute to transparency, accountability and trust among all participants.

Another major area of concern about the rule-making process relates to the nature and extent of consultation beyond Transport Canada, Rail Safety and the industry. As mentioned in Chapter 3, the provinces are concerned that they are not consulted about rules that will have a major impact on railways under their jurisdiction. They are usually informed after the rules are approved. To aid federal-provincial harmonization of safety practices and collaboration between the two levels of government, Transport Canada should ensure that the provinces are consulted before new rules are adopted, and are kept informed as the development of proposed rules proceeds. Similarly, the unions representing railway workers are typically consulted by the industry at the very end of the development process, and given 60 days to comment on the draft rules.

A better approach to consultation is for the team developing a rule to consult other interested parties throughout the development process, rather than simply meeting the minimum requirement under the Act. In recommending a more open, consultative approach, we are not suggesting that other interested parties necessarily have a place at the rule-making table. Rather, we believe that two kinds of changes are necessary. First, the attitudes of Transport Canada and the railway industry should become more open and responsive to input. Second, mechanisms should be created and supported to provide opportunities for input and discussion before and during rule making, not just after the fact.[26] Meaningful consultation during the development of regulatory proposals, in fact, saves time and money in the long run.

Finally, we are very concerned about the quality of drafting of rules. Although rules, once approved by the Minister, have the same force and effect as regulations, they are not statutory instruments[27] and, therefore, are not subject to the requirements set out in the *Statutory Instruments Act.* As a result, draft rules are not reviewed by experts in regulatory drafting at the Department of Justice with respect to language, consistency with other rules, scope and jurisdiction, delegation of powers, enforce-

[25] Ibid., section 5-B, "Issue 2."

[26] Ibid., section 5-B, "Issue 3."

[27] RSA, s. 46(b).

ment of goal-oriented provisions, and other issues which would be considered when regulations are drafted.

This is a serious deficiency. We learned that poor quality drafting has led to difficulties in enforcing several rules – the *Track Safety Rules* are an example. These provisions leave considerable decision-making discretion to railway employees, especially regarding what falls under exemptions to the rules, and make it difficult for companies and inspectors to know what, in fact, constitutes an infringement of the requirements.

The quality of drafting rules needs to be improved to ensure that they are clear, unambiguous, and enforceable. At a minimum, draft rules should be reviewed by Department of Justice lawyers to ensure that drafting norms are met. Transport Canada should also consider providing training in regulatory drafting to all those engaged in the rule-making process, including their own employees in the Rail Safety Directorate.[28]

We recommend that Transport Canada, in consultation with the industry and other stakeholders, establish an improved process for developing rules under the RSA that addresses the issues outlined above. To ensure wide participation and public notice of the changes, we recommend that the process be outlined in the form of a regulation.

RECOMMENDATION 10

A process for the formulation and/or adoption of rules, standards and exemptions should be established by regulation. All stakeholders must have an opportunity to be involved in developing the process. This regulation should embody the following principles:

- **transparency and openness;**
- **early and meaningful involvement of Transport Canada;**
- **appropriate participation of stakeholders;**
- **high quality legal drafting; and**
- **consistency with section 3 of the *Railway Safety Act* to facilitate a modern, flexible and efficient regulatory scheme.**

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[28] Silverstone, *Framework*, op. cit., paragraphs 169-182.

4.3.6 The Role of the Railway Association of Canada in Rule Making

Whether the Minister directs the industry (or an individual railway company) to develop a rule, or the industry initiates its development, the procedural steps are the same. The industry drafts the rule and is required to consult organizations that are likely to be affected by it, giving them at least 60 days to comment. The main industry association – the Railway Association of Canada (RAC) – usually leads the rule-making process on behalf of its members. Individual railways decide if they will sign on to the proposed rule, which they are encouraged to do by the RAC. The proposed rule is then submitted to the Minister for approval. The procedure is that the RAC will file a proposed rule with a list of signatory railways attached as an annex. Once approved by the Minister, a rule has the same force and effect as a regulation.[29]

The RAC's authority to undertake this work on behalf of its members may not be clear, as the RSA refers only to railway companies developing rules on their own initiative or when directed to do so by the Minister. The RAC currently performs this work under powers of attorney from those members who wish to adopt the rule.[30] The current practice could be seen as a delegation of powers from individual companies to an industry association that represents their interests. A principle of public law, however, prohibits the further delegation of powers extended by legislation to an individual or a company. To clarify this situation, the Act should expressly provide for railway companies to appoint an agent, such as the RAC, to act on their behalf in developing draft rules, by allowing them to delegate the powers set out in the Act related to rules.

RECOMMENDATION 11

The *Railway Safety Act* should be amended to clarify that a railway company may delegate its power to develop and submit a rule to the Minister for approval.

4.3.7 The Process for Extending a Rule to Additional Railways

A railway company can also undertake to be governed by a specific rule that is already in effect by becoming a signatory to the rule after the fact, whether or not it is a member of the RAC. The RSA does not, however, expressly provide a process for extending coverage of a rule to companies that were not part of the original submission. We learned that the practice of Transport Canada, Rail Safety Directorate is to write to a railway company that is not otherwise bound and ask if it wishes to be party to the rule, or to submit its own rules. Usually, the company will assent

[29] RSA, s. 23.

[30] Silverstone, paragraphs 166-168.

by letter, indicating that it will comply with the approved rule.[31] The legal effect of this exchange of letters should be clarified. We conclude that it would be helpful to clarify and legitimize a process for railways to "sign on" to rules after they have been developed and implemented.

As it stands now, the Act does not require a new railway company to submit a rule, if it does not sign on to an existing one. This creates potential regulatory gaps, particularly for a new company operating on its own track. However, the Minister has the power to direct a railway company to develop a rule. If the company fails to file a rule after having been directed to do so by the Minister, the Minister can develop his own rule, after consultation.[32] Also, if a new railway company runs on CN or CP track, it will be subject to the host railway's rules through the operating agreement between them.

To complement this, the Minister should also have the power to extend the application of an existing rule to a given railway company – always, of course, with appropriate consultations among directly affected parties.

RECOMMENDATION 12

The Minister of Transport should have the power, after appropriate consultation, to extend the application of an existing rule to a given railway company. There should also be a process in the Act for a railway company to adopt an existing rule.

4.3.8 Enforcement Powers

Our terms of reference specifically directed us to examine the adequacy of the existing enforcement powers under the *Railway Safety Act* and to consider whether administrative monetary penalties (AMPs) should be added to the range of enforcement actions available under the Act.

The RSA provides rail safety inspectors with significant powers under section 28 to enter premises, inspect, seize property and question people, in carrying out their responsibilities. When a violation is found, the inspector will normally issue a letter of non-compliance, specifying what is not in compliance and setting out the time frame within which the railway must correct the situation. Railway safety inspectors carry out follow-up inspections to verify corrective actions undertaken by the regulated party.[33] Failure to correct the non-compliance will result in either steps towards

[31] Ibid., paragraph 166.

[32] This particular aspect of the Minister's power to make a rule, under section 19(7) of the Act, has never been used to date.

[33] See Silverstone, *Framework*, op. cit., paragraphs 309-310, 349.

prosecution, the issuance of a notice (if there is a threat to rail safety), or a notice and order (if the threat is immediate).

Refusal to comply with a letter of non-compliance is not sufficient, in itself, to justify a section 31 notice. The threat to safe railway operations must be assessed in each case. In addition, a section 31 notice and order cannot automatically be used as a progressive step when a railway fails to comply with a letter of non-compliance or a notice. In this case, the immediacy of the threat to safe railway operations must be demonstrable. If the threat is considered immediate, the inspector has the power to issue a notice and order requiring the railway company not to use those works or equipment, or to use them subject to conditions established in the order. The railway company must follow the conditions set out in the order until the inspector is satisfied that the threat is removed. Transport Canada inspectors issued a total of 214 notices and orders from 2003 to 2006.[34]

The Minister can also issue emergency directives to a railway, if he is of the opinion that there is an immediate threat to safe railway operations, and can order the railway to stop using certain works or railway equipment, or to follow a maintenance or operating practice specified in the directive. The exercise of this power has been delegated to the Director General of Transport Canada, Rail Safety Directorate. A ministerial emergency directive remains in effect for six months, and the period can be renewed. Ministerial emergency directives cannot be appealed. They can be made orders of the Federal Court and would be enforceable under the *Federal Courts Act.*[35]

If a railway fails to comply with the rules and regulations cited in the letter of non-compliance and an immediate threat to safe railway operations cannot be demonstrated, the only recourse is prosecution, which is a very cumbersome remedy for many rule violations. Because this process is so costly and time consuming, it is used very infrequently and is, therefore, ineffective for many violations.

This represents a significant weakness in the enforcement scheme of the *Railway Safety Act.* We recommend that administrative monetary penalties be implemented as an additional enforcement option under the *Railway Safety Act,* and as an alternative to prosecution, particularly in respect of cases of persistent non-compliance, for example. The availability of administrative penalties would also make rail safety consistent with other modes of transport, particularly civil aviation and marine, as well as with the transportation of dangerous goods in all modes of transport under federal jurisdiction.

An administrative monetary penalty scheme is a more efficient and less costly means of enforcing legislative requirements than prosecution, since it uses administrative,

[34] Quoted in Silverstone, *Framework*, op. cit., paragraph 358.

[35] RSA, ss. 33-34.

rather than judicial, processes. This is consistent with the principles of minimizing the regulatory burden on Canadians, while at the same time promoting regulatory compliance.

Sections 228-243 of the *Canada Shipping Act 2001*, and the proposed *Administrative Monetary Penalties Regulations* under that Act, provide a sound model for an administrative penalty scheme under the RSA. Administrative monetary penalties apply to contraventions of the *Canada Shipping Act* designated by regulations, and they are an alternative to criminal prosecutions. The regulations set out a range of penalties for various contraventions, while the Act provides for reviews by the Transportation Appeal Tribunal of Canada. The Minister can suspend the penalty if the person or vessel undertakes an "assurance of compliance" and remedies the non-compliance within a specified period.

An administrative penalty regime under the *Railway Safety* Act should follow the same principles. The proposed approach allows for a degree of discretion in the decision to impose a penalty and the determination of the level of the penalty. That discretion should be exercised according to clearly established principles. To assure predictability and accountability, those principles should be accessible through the publication of an enforcement policy. The decision to impose a penalty should be the Minister's, and should be exercised by senior officials within Transport Canada. We do not think it appropriate for railway safety inspectors to have this authority. A decision to impose an administrative penalty should be reviewable by the Transportation Appeal Tribunal of Canada.

The main elements of the system should be outlined in the *Railway Safety Act*, itself. More detailed provisions, such as the amount of penalties and types of procedures, should be set out in regulations.

RECOMMENDATION 13

An administrative monetary penalty (AMP) scheme should be included in the *Railway Safety Act* as an additional compliance tool. The scheme should include the following elements:

- **the decision to impose a penalty should be the Minister's decision;**
- **before a decision is made, due process should be followed;**
- **the decision should be reviewable by the Transportation Appeal Tribunal of Canada;**
- **the level of fines should be consistent with those imposed in the aviation and marine modes; and**
- **an enforcement policy prescribing parameters for AMPs should be made public.**

In summary, the enforcement powers currently set out in the *Railway Safety Act* need to be reinforced by the introduction of an appropriately structured scheme of administrative monetary penalties and the ultimate sanction of removal of an operating certificate. These additional enforcement mechanisms will complete the array of powers provided to the department to ensure compliance with the *Railway Safety Act*, regulations and rules, together with reinforcement of safety management system requirements.

4.3.9 Review of Orders

The *Railway Safety Act* provides for a review by the Transportation Appeal Tribunal of Canada (TATC) of an order made by a railway safety inspector under section 31. The review is conducted by a member of the TATC who can either confirm the order or refer the matter to the Minister for consideration. The member cannot substitute his or her own decision for that of the inspector and thus cannot revoke or alter the inspector's order. The same is true in the case of an appeal to a panel of the TATC from a decision of one of its members. The Tribunal can only dismiss the appeal or refer the matter to the Minister for consideration; it cannot substitute its own opinion for that of the inspector.[36]

In contrast, under the *Aeronautics Act*, in case of an immediate threat to aviation safety or security, the Minister's decision to suspend a Canadian aviation document is subject to review and appeal to the TATC[37] in the same manner as in the RSA, but the member or the panel can substitute its own decision for that of the Minister as to whether an immediate threat to aviation safety or security exists. We believe that this aspect of the *Aeronautics Act* provides a sound model for the RSA to follow.

The same problem arises for TATC review of ministerial orders under sections 32.1 and 32.2 of the RSA. The Tribunal can only confirm a ministerial order or refer it back to the Minister for reconsideration.[38] This too is inconsistent with the approach of the *Aeronautics Act* and does not provide for a robust review system. This argument also applies to decisions of the Minister related to administrative monetary penalties, whose implementation we have recommended above, including the possibility of review by the TATC.

[36] RSA, ss 31.1-31.2. Since the TATC was given jurisdiction for railway safety matters in 2003, there have been very few requests or appeals under provisions of the RSA – six were filed to be heard at the first level, and all have been withdrawn (see Silverstone, *Framework*, op. cit., paragraph 426).

[37] *Aeronautics Act* (1985, c. A-2), ss. 7(3), 7.2(1). "Canadian aviation document" includes licences, permits, accreditations, certificates or other documents issued by the Minister – for example, a pilot's licence, operating or airworthiness certificate, Transportation Security Clearance for aviation workers, etc.

[38] RSA, ss. 32.1(5) and 32.2(3).

RECOMMENDATION 14

Sections 31.1(4) and 31.2(3) of the *Railway Safety Act* should be amended so as to authorize the Transportation Appeal Tribunal of Canada, in the case of a review of an order of a railway safety inspector, to confirm, revoke or alter the order.

RECOMMENDATION 15

Similar amendments should be made in relation to the review of a ministerial order under sections 32.1(5) and 32.2(3) of the RSA.

4.3.10 Obsolete Provisions

We learned that many orders and regulations are still in force under the *Railway Safety Act* that may have come into effect many years ago – indeed, under predecessor legislation, such as the *Railway Act* or the *National Transportation Act,* which are no longer in force. For example, the RAC's website provides a list of 25 orders issued by the Canadian Transport Commission or the National Transportation Agency of Canada between 1981 and 1988. Some of these were issued at the request of one or more railway companies, and amount to a form of rule making before that option was provided by the *Railway Safety Act*, beginning in 1989.[39]

This issue is not new. We note that the committee that undertook the statutory review of the new RSA in 1994 had similar concerns and recommended a "sunsetting" provision to revoke all orders, rules or regulations issued by previous authorities.[40]

We learned that it is difficult to gain ready access to a comprehensive set of applicable regulations, rules and orders. Some rules still contain text that has long since been superseded by a separate rule or regulation. We do not propose a strict timeline for repealing all superseded provisions, but suggest that a five-year time frame would be appropriate for the modernization process. All orders, rules or regulations currently in effect should be published in a convenient location on Transport Canada's website, and Transport Canada and the RAC should work together to keep this up to date.

RECOMMENDATION 16

All orders, regulations and rules related to safety should be reviewed and those that are obsolete should be amended or repealed.

[39] http://www.railcan.ca/sec_leg/en_rac_orders.asp

[40] Railway Safety Act Review Committee, *On Track: The Future of Railway Safety in Canada*, Report of the Railway Safety Act Review Committee (December 1994), Recommendation 10.4, page 170.

CHAPTER 5
SAFETY MANAGEMENT SYSTEMS

The *Railway Safety Act* (RSA) requires railways to implement and maintain a safety management system (SMS), which is defined as a formal framework for integrating safety into day-to-day railway operations. SMS is a modern, flexible and efficient regulatory approach that aims to improve rail safety in Canada. Throughout the consultative process, the Panel heard many opinions about SMS.

This chapter outlines the history of, and rationale for, the SMS approach, assesses its implementation, and addresses the importance of an effective safety culture, oversight and risk assessments to SMS.

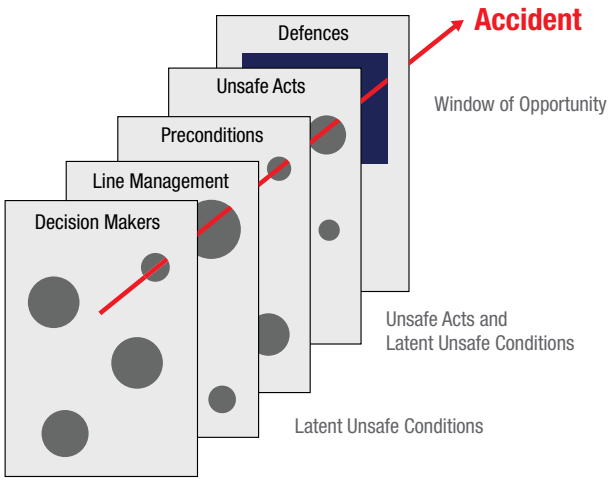
5.1 THE SMS CONCEPT

The concept of safety management systems grew from an evolution in thinking about safety practices and the causes of accidents during the 1990s. The original *Railway Safety Act* did not set out requirements for safety management systems. Rather, *SMS Regulations* were added as part of the 1999 amendments to the Act.

Traditionally, in rail and in other safety-critical industries, safety had been pursued through compliance with prescriptive rules and regulations. In the 1990s, however, advancements in safety research demonstrated that organizations could be compliant with prescriptive regulations, yet still be unsafe. More specifically, compliance did not necessarily mean effectively managing risks.

At the time, researchers and safety managers were also working to understand human behaviour in the context of accidents. In 1990, James Reason presented a now well-known model of accident causation (the Swiss Cheese model) that explained how human beings contribute to the breakdown of complex, interactive and well-guarded systems, such as rail transportation.

FIGURE 5.1: REASON'S MODEL OF ACCIDENT CAUSATION



According to Reason, most accidents can be traced to one or more of four types of failure: organizational influences, unsafe supervision, preconditions for unsafe acts, and the unsafe acts themselves. These can be characterized as latent (underlying) or active conditions.

In the "Swiss Cheese model," defences against failure within an organization can be considered as a series of barriers, which are represented as slices of swiss cheese. The holes in the cheese slices represent individual weaknesses or even breaches in individual parts of the system, which continually vary in size and position in any of the slices. The system as a whole produces a failure when a series of holes in each of the slices momentarily lines up, allowing what Reason describes as "a trajectory of accident opportunity," so that a hazard passes through all of the holes in all of the defences, leading to a failure.[1]

Reason's model provides an understanding of how humans contribute to the break-down of complex systems. Most importantly, the model demonstrates that the whole system must be considered when evaluating safety performance. With this new understanding of accident causation, it became clear that the traditional prescriptive approach to regulatory oversight *alone* was insufficient for preventing accidents.

Concurrently, transportation regulators realized that as traffic volumes increased, the total number of accidents would increase, even if the accident rate remained the same (i.e., the number of accidents per level of activity). Under an exclusively prescriptive regulatory approach, this would have required a significant injection

[1] See, for example, James Reason, *Human Error* (Cambridge University Press, 1990); other references provided in Terry Kelly, SMS Aviation Safety Inc., *An Examination of the Regulated Requirement for Canadian Railway Safety Management Systems* (August 2007), Appendix B.

of resources for regulatory oversight, simply to maintain or further reduce the total number of accidents. Regulators recognized, as well, that projected shortages of technical personnel in the industry would make it difficult to recruit the staff necessary to sustain a traditional regulatory oversight model.

Also in the 1990s, the Government of Canada was evolving from the owner-operator of major portions of the transportation system to the regulator and policy-maker. Increasingly, safety depended upon a partnering approach – with industry responsibilities focussed on the safety of the operations and the regulator focussed on a safe national transportation system. As the railway industry continued to grow and evolve, there was an even more pressing need to apply modern safety practices.

Of course, risk had always been a part of transportation systems, and those charged with managing safety began to conceptualize a system where hazards were identified and assessed, and the resulting risks were then managed proactively. Lessons learned from accidents, incidents and day-to-day operations would be injected into the system, thus leading to "continuous safety improvement."

While this evolution in thinking about safety, accident causation, and regulatory oversight was occurring, the 1994 review of the *Railway Safety Act* occurred. It was during that review that the concept of safety management systems for railways was born and, indeed, came to be seen as a way of regulating more effectively. As a result, amendments to the *Railway Safety Act* were introduced in 1999 that added requirements for railway companies to develop and implement safety management systems.

SMS BENEFITS

- Improved decision making
- Learning about operations
- Improved safety performance
- Customized mitigation strategies
- Possibly exceeding safety standards set by regulation
- Improved public and customer confidence
- Increased competitive advantage
- Demonstrated due diligence
- Potential for reduced regulatory oversight
- Enhanced relationships and collaboration
- Improved economic performance

The key for railway companies was to become more proactive, to refine their abilities to identify hazards, and to assess and mitigate risks. The need for companies to build a safety consciousness into their day-to-day operations was of paramount importance. This represented a shift from the traditional reactive approach of considering what had happened in a post-accident environment. As railway companies adopted the SMS concept, they began to fully realize the benefits that can be derived.

For example, companies can profit from improved decision making on safety-related issues and can learn more about their operations through the higher level systems perspective that the SMS approach offers.

They can achieve improved safety performance and customize mitigation strategies to their own operations, which is especially important in the case of smaller operators and short lines. This means mitigation can actually exceed standards set by regulation. In the end, higher public and customer confidence result.

Companies also benefit from an increased competitive advantage and can demonstrate that they are constantly taking safety into consideration in their decision making. There is significant potential for reduced regulatory oversight, and improved relationships, partnerships, and collaboration.

A strong SMS can lead to economic benefits because safety and economic performance are linked. There are direct and indirect cost savings when accidents are prevented, because accident clean-up is costly and shutdowns cause lost revenues. In short, safety is good for business.

Evidence of the economic rationale for SMS is provided by companies that report spending fewer resources because they solve problems much earlier and avoid costly abnormal operations. In fact, in aviation, some companies report significantly improved economic performance because the implementation of safety management systems has helped to avoid costly abnormal operations (e.g., late flights, passenger compensation), which are associated with accidents and incidents.

When the railway *SMS Regulations* came into force on March 31, 2001, they were the first of their kind in the federal Canadian transportation sector. They were created with significant industry input and placed the responsibility for managing the safety of operations on the railways themselves. They were not intended to replace existing regulations, rules or standards, but to develop a more comprehensive way of managing safety by complementing the existing regulatory framework.

Under the *SMS Regulations*, railway companies must implement and maintain a safety management system plan that includes a safety policy with annual safety targets and initiatives to meet those targets. There must be clear responsibility for safety at all levels of a company and a means to involve employees in safety management. Systems for identifying and showing compliance with applicable rules and regulations are required. A process for identifying hazards, and assessing and mitigating risks must be in place. Processes and procedures for accident reporting and investigation are also required. Methods to ensure that employees are appropriately trained must exist. Procedures for data collection and analysis and periodic internal safety audits are required. Finally, there are requirements for monitoring corrective actions and consolidating documentation.

This framework must be in place to achieve a systems approach to managing safety – one that embodies taking action *before* accidents occur.

5.2 IMPLEMENTATION OF SAFETY MANAGEMENT SYSTEMS

It has been nearly seven years since railways have been required to implement SMS. While progress has certainly been made, in the Panel's opinion, the implementation of SMS across the rail transportation system and by the regulator has been inconsistent. The Panel expected that, after so many years, both the regulator and the industry would have made more progress.

During public consultations, the Panel received many submissions that focussed on SMS implementation and related topics, such as safety culture, appropriate oversight and risk management. Those with the most to say about SMS were the railways (Class 1s, short line, passenger, and commuter), Transport Canada, and union representatives. Railway employees largely had less to say because many told us they were unaware of SMS or had not been trained in its objectives.

> While much progress has been made, most employees have only a cursory awareness of [the] existence [of SMS] and what it means to them.
>
> CAW-TCA Canada, Submission, page 12.

Generally, stakeholders thought that SMS was the right approach, but many submissions tended to support the view that improvement is needed before SMS could be considered to be fully implemented.

We were also made aware of misunderstandings about the intent of SMS. Some stakeholders were under the impression that SMS would replace regulations but the Panel understands that SMS was never intended to be de-regulation or industry self-regulation. Rather, an effective SMS depends on both the industry and the regulator working to better manage the risks inherent in the system and to improve safety performance on a continuing basis.

Independent research commissioned by the Panel also found issues with the implementation of SMS across the country. Maturity of SMS plans varies widely across companies, with progress being remarkable in some companies and uneven in others. The weakest component in SMS plans appears to be in the management of human and organizational factors, rather than in respect of technical or equipment aspects.

The integration of SMS into Transport Canada's regulatory oversight program for rail safety has been inconsistent. In the Panel's opinion, clear direction and support are required from national headquarters to overcome inconsistent approaches to delivery throughout Transport Canada's five regions. Nonetheless, research confirms that SMS offers a significant advantage over traditional, exclusively prescriptive,

regulatory models,[2] but there remains disagreement about the extent to which SMS has been successfully implemented across the system.

RECOMMENDATION 17

The Panel supports the safety management system approach and recommends that both the railway companies and Transport Canada focus their efforts to improve its implementation.

We now turn our attention to understanding how implementation can be improved in the areas of safety culture, oversight and risk assessments.

5.3 SAFETY CULTURE

The cornerstone of a truly functioning SMS is an effective safety culture. The Panel views such a culture as one in which safety values are firmly entrenched in the minds of managers and employees at all operational levels, and respected on a daily basis in the performance of their duties. It is demonstrated by the decisions, actions and behaviour of individuals.

REASON'S ELEMENTS OF AN EFFECTIVE SAFETY CULTURE

- A just culture (with an atmosphere of trust and clear understanding of acceptable and unacceptable behaviour);
- A reporting culture (where people report their errors and near-misses);
- A flexible culture (which adapts to changing demands);
- A learning culture (which implements the reforms needed to make the system safer); and
- An informed culture (which has current knowledge).

An effective safety culture is one where past experience is not taken as a guarantee of future success and organizations are designed to be resilient in the face of unplanned events. Open communication and fresh perspectives are encouraged, and managers and employees at all levels are involved. New and ongoing practices and procedures are regularly compared, reviewed and improved. Human error is treated as a possible indication of broader, organizational influences.

[2] See Kelly, SMS Aviation Safety, Safety Management Systems, op. cit.

There is an investment in safety, and the regulator and industry work together towards continuous improvement.

The success of a safety management system depends on effective communication and information sharing at all levels in an organization – from senior managers to front-line workers. The Panel believes that there is a vital role for railway employees and their representatives to play in implementing successful safety management systems.

> Safety Management Systems must be built from the ground up, dedicated to detecting hazards and controlling them.
>
> United Steelworkers Submission, *View From The Track*, page 16.

Employees can be a company's prime source of information for the identification of hazards and assessment of mitigation strategies. The Panel heard from many railway employees who felt neither involved nor informed about their company's safety management system. Rather, employees often described their organizational culture in such a way that the Panel could not reconcile it with an effective safety culture.

> [Changing culture] is a journey; the progress we have made is still fragile. There are wide disparities within CP on acceptance and use of this approach and the various "tools" that have been introduced. And there is much more work to do. But generally, we are trying to move from a culture that blames the individual who ultimately makes the final error in the chain of accident causation, to one where we ask system-based questions such as: What defenses failed? How did they fail? How can the system be made more resistant?
>
> *Faye Ackermans, General Manager, Corporate Safety and Regulatory Affairs, CP, Statement to U.S. House of Representatives, Committee on Transportation and Infrastructure (October 25, 2007), pages 5-6.*

SMS requires drastic cultural change for both the regulator and the regulated. The Panel recognizes that culture change is a long-term endeavour and no easy task. It requires the simultaneous building of new values with the destruction of old ones. It can be easier to change practices, with the associated values and culture changes eventually following naturally. Additionally, in relaying their experience with SMS, representatives of some transportation companies told us that, in some cases, building the culture necessary for effective implementation of SMS meant sweeping changes at their management levels.

5.3.1 Culture Change in the Railway Industry

Among major rail companies, VIA Rail has a respected SMS system and entrenched safety culture. In part, this is because it is a passenger-carrying railway and the market demands safe transportation, but the Panel also noted that VIA takes safety management seriously by making it important to everyone in the company.

In the Panel's opinion, CP is making great strides in adopting the kind of safety culture required for a successful safety management system. We were very impressed with CP's approach to occupational health and safety committees and the role that these committees play in safety management. In particular, the Panel applauds the engagement of a health and safety committee member in various CP accident and incident investigation protocols. These are steps in the right direction.

CN also made a positive first step in appointing a Chief Safety Officer in April 2007. The Chief Safety Officer requires the complete support of the senior management team to succeed, and all of the management group will need to be actively involved in inculcating the values and beliefs of an effective safety culture. In the Panel's opinion, CN's current day-to-day management of safety must evolve to the healthy safety culture necessary for a successful safety management system. With some exceptions, employees recounted a culture based on fear and discipline.

Based on what we heard throughout the Review process, there appears to be a serious disconnect between CN's stated objectives and what is occurring at employee levels. CN manages safety through an "antecedent, behaviour and consequences" process, which the Panel feels is constructed as a traditional rule and discipline model.

While rules certainly have had a positive impact on safety, rules *alone* may no longer be the most appropriate approach, given the modern understanding of accident causation. As noted earlier, a company can be in total compliance with prescriptive regulations, yet not necessarily be safe.

Further, current thinking about safety has evolved beyond designing safe processes and automating the human element necessary within these processes through rules.

> Accidents were … analyzed up to the point where it became clear that someone had broken a rule (at which point discipline was appropriate) or that there was no rule for this eventuality (in which case a new one was made). In this way rulebooks continually grew and never diminished. … Ultimately, we get a rule for everything and safety is seen as something [that] requires no thinking any longer, but simply good training, a prodigious memory, a large safety manual or computer to refer to, and an iron discipline. Management does not need to do any more thinking or planning, because it is all fixed in the rule system.[3]

We also heard that a strict, rules-based system lays blame on employees for errors or failures, but fails to sufficiently recognize the management influences or organizational situations that may be contributing to those errors or failures. The Panel agrees.

[3] Andrew Hale, "Rail Safety Management: The Challenge of the New Millennium," *Safety Science Monitor* (Volume 4, Issue 1, 2000), pages 7-8.

> CN's attitude towards safety seems to be "blame and punish" instead of "educate and correct." … Frequently, employees involved in accidents … are simply blamed for errors without follow up or root cause investigation. They are then punished without any other corrective action taken on the part of the railway to prevent reoccurrences.
>
> Sylvia LeBlanc, Submission, page 1.

This is not to say that there is no need for rules or discipline for "intentional bad behaviour," wilful negligence or criminal activity in the rail industry. There certainly is such a need. A real or perceived over-reliance on discipline as the consequence of most actions is problematic in an effective safety management system. The Panel sees such an over-reliance as a culture where strict adherence to rules is achieved primarily through discipline or a threat of potential discipline. Disciplinary cultures have a tendency to instil fear, and to stifle employee participation and reporting. A significant mistrust of management develops. People stop communicating – and that can have a detrimental impact on safety.

In the Panel's opinion, over-reliance on discipline does nothing to support healthy management-employee relationships so vital to an effective safety management system. Such relationships must be built on openness and trust and this is difficult or impossible to instil in an environment where employees are constantly fearful of disciplinary action.

It is noteworthy that Air Transat has implemented a reporting system that balances open (though not anonymous) reporting of risks with appropriate discipline. This system is based on a formal understanding between management and employee representatives that provides immunity from corporate disciplinary measures (though not from regulatory or legal penalties) for those who report safety-related information. It has resulted in Air Transat employees feeling comfortable to report risks without fear of being disciplined, and it links directly to safety benefits.[4]

At VIA, as at most railways, there are certain "cardinal rule" violations where discipline is necessary, but VIA also has processes in place aimed at building openness and trust between managers and employees. For instance, employees are observed at regular cycles, and corrective coaching takes place immediately when errors are observed.

The Air Transat and VIA examples demonstrate that it is possible to have an effective safety management system based on a balance between openness and reporting, and appropriate discipline.

Recognizing that railways are at different stages of implementing SMS and, notwithstanding the challenges posed by effecting the culture shift needed to derive maximum benefit from an SMS, the Panel feels that this culture shift is the

[4] Meeting with senior managers of Air Transat, September 10, 2007.

cornerstone to implementing truly effective and efficient safety management systems. Resources and commitment will be required to implement such a cultural change.

RECOMMENDATION 18

Transport Canada, Rail Safety Directorate and the railway industry must take specific measures to attain an effective safety culture.

5.3.2 Employee Involvement in Occupational Health and Safety

As we noted earlier in the report, safety in rail transportation is not governed by the RSA alone. Human Resources and Social Development Canada (HRSDC) administers the health and safety of workers in federally regulated workplaces, including railways under federal jurisdiction, under Part II of the *Canada Labour Code* (CLC-II). For on-board employees, this responsibility is delegated to Transport Canada, Rail Safety. HRSDC maintains responsibility for so-called "off-board" employees, such as those performing track maintenance and car and locomotive repairs.

We understand that the working relationship between Transport Canada and HRSDC in general is very good – that communications are effective, and responsibilities and accountabilities are clear. It is also essential that the local occupational health and safety committees for railway employees, required under the Labour Code, function effectively and share information and feedback that contributes to overall railway safety.

As discussed in Chapter 4, the occupational health and safety provisions of CLC-II require every employer to establish a workplace health and safety committee for each workplace that has 20 or more employees. The committees are responsible for health and safety matters that apply to those individual workplaces. Management and employees participate in the committees, and in unionized workplaces, representation of employees is through the unions involved. The Code also requires employers to appoint a health and safety representative for each workplace with fewer than 20 employees. Companies that directly employ 300 or more are also required to establish a policy health and safety committee, which has a broader policy, planning and monitoring mandate.

We were made aware of very active health and safety committees in several of the larger railway companies, and we had the opportunity to meet company and union committee members in different parts of Canada. It is clear that, like all collaborative mechanisms, when these committees are functioning well – when their members are engaged and committed, when training is adequate, when attendance is regular, and when management is responsive – they are extremely valuable for

sharing information about safety practices and concerns, and in providing feedback to management and employees. The committees can be very effective in providing a formal mechanism for identifying concerns and for establishing a time frame within which to directly respond and resolve problems. They are an outstanding tool for managing safety, involving employees and building an effective safety culture. They should be an essential element of a safety management system.

Workplace health and safety committees, and the policy committees in larger companies, should involve employees in identifying hazards and assessing and mitigating risks in their own workplaces. This is not to suggest that the effective use of health and safety committees can satisfy all aspects of a company's SMS – after all, as we note throughout this report, the framework for railway safety contemplated under the RSA is broader than individual workplaces. Nevertheless, the structure that the committees provide, and the relationships that are developed within it, can contribute to an overall spirit of collaboration and an atmosphere of mutual trust and respect. These help to create an effective safety culture essential for implementation of safety management systems.

RECOMMENDATION 19

The industry must take every appropriate measure to ensure the effectiveness of local occupational health and safety committees. Specifically, they should involve employees in identifying hazards, and assessing and mitigating risks as part of safety management.

5.3.3 An Evaluation Tool for "Safety Culture"

A practice to determine where a company (and, indeed, the regulator) stands in terms of implementing an effective safety culture may be to use a measuring tool that categorizes where a company is situated along a continuum to full implementation of SMS. One such model,[5] developed for the aviation industry, contains certain components that could be applied to the rail industry.

At one end of that continuum is a company that complies with minimum safety standards and views compliance as a cost of doing business. That company minimizes compliance expenditures and operates from a short-term perspective, addressing problems only after it has been caught in violation. The regulator must engage in significant surveillance and enforcement activities.

Next in the continuum is a company that views safety solely as compliance with current safety standards. Such a company has internal inspection and audit

[5] Bryce Fisher, "Regulators Must Oversee Companies and People that Reflect the Entire Safety Spectrum," *ICAO Journal* (Volume 60, Number 4, July/ August 2005).

processes, as well as a system of reward and punishment. There is an assumption that compliance translates into safety, but such a company has not yet realized that compliance alone will not necessarily prevent an accident from happening. Intervention is still required from the regulator, though the approach may be more educational in nature.

At the third stage along the continuum is a company that sees safety as risk management and recognizes that compliance alone cannot guarantee safety. This company is anticipatory and identifies the potential for hazards before they occur. The regulatory approach must evolve from compliance inspections to system audits.

At the next stage is a company that views safety as an opportunity. This company leverages its safety management capability to its economic benefit. It has a longer-term outlook and proactively seeks to include safety in its business and operational decision-making processes. The regulator's role is primarily one of monitoring the company's safety performance.

Finally, at the advanced end of the continuum, is a company that has fully integrated safety into its business practices. Safety is reflected in core values and built into the business model. Again, the regulator's role is one of monitoring.

This safety culture continuum demonstrates that the shift to an effective safety culture is an evolution. Transport Canada could help companies to identify where they fall along this continuum.

The Panel recognizes that changing culture is not easy to achieve, but feels that this is the foundation upon which effective railway safety management systems will be built.

5.3.4 Culture Change in Transport Canada

Culture change is also required on the part of the regulator. Transport Canada recognizes that it is facing its own challenges in this respect. The department's recent publication (April 2007) entitled *Moving Forward: Changing the safety and security culture,* identifies one of the key challenges as demonstrating the impact of safety management on performance.

In the Panel's opinion, and as illustrated by the continuum, a shift in thinking will also be needed by the entire Transport Canada, Rail Safety organization. To effectively manage an SMS oversight model, the regulator will need to recognize the industry's primary responsibility for safe operations. Transport Canada's regulatory oversight program must be designed while bearing in mind where the greatest risks lie in the rail system. Success will need to be measured based on safety performance results, rather than simply the number of regulatory interventions.

Developing the capability to provide effective oversight of safety management systems, and investing the appropriate human and financial resources to ensure its success will also need to be addressed.

Training and development of Transport Canada employees must support the culture shift needed for effective and efficient oversight of SMS in industry. Traditionally, Transport Canada railway safety inspectors were trained in forensic investigative techniques to monitor compliance with existing rules and regulations. This training was appropriate for a time when the focus was on investigations to measure compliance and non-compliance, but this focus has shifted to a systems-based audit approach, required under SMS.

In the traditional model, inspectors were used to dealing directly with their peers in industry. Under SMS, "inspectors are called upon to intervene at a more strategic level and are required to interact with system managers whose motivations, contingencies, views, frame of reference, and language may be completely new to them."[6]

Unfortunately, despite the culture change necessary at Transport Canada since the inception of SMS, it is the Panel's opinion that the resources provided are inadequate to inculcate the culture and skill sets required to effectively manage and oversee SMS in industry.

We are concerned, for instance, that Transport Canada's administration of the *Railway Safety Act SMS Regulations* and audit program are treated as an "add-on" by the department, and have not been well integrated with the existing regulatory oversight program. Instead, traditional functional groups continue to operate separate from SMS-focussed inspectors and program groups. It is important for Transport Canada, Rail Safety Directorate to design its organization to support its oversight of railway SMS plans as its central regulatory oversight activity.

RECOMMENDATION 20

Transport Canada, Rail Safety Directorate should be organized so as to better integrate safety management systems as the key focus of its oversight activities.

Transport Canada also needs to accelerate the transition from inspections to audits. As discussed later in the chapter, there are several changes that Transport Canada needs to bring about to improve its audit regime. These improvements will lead to a more appropriate safety culture. This will require new resources, skills and training for Transport Canada personnel.

[6] Ibid.

The Panel recognizes that inspections and audits are two very distinct functions, each requiring unique skill sets. We are of the opinion, however, that training an individual to perform both of these functions would accelerate the culture change required to oversee an SMS approach. The Panel also feels that changing the label associated solely with an inspection regime would be a step in the right direction.

RECOMMENDATION 21

In order to better reflect the fact that the current railway safety inspector (RSI) performs both inspections and audits, the title should be changed to Railway Safety Officer.

5.4 OVERSIGHT OF RAILWAY SAFETY MANAGEMENT SYSTEMS

A key for making SMS work is an appropriate oversight system. The philosophy in the *Railway Safety Act* that makes railway companies responsible for ensuring the safety of their own operations means that the regulator assures compliance through performance-based oversight, rather than prescriptive enforcement. Under a prescriptive regulatory model, the regulator inspects industry with the view to identifying non-compliance with the rules and regulations. The oversight system required under SMS is fundamentally different from this approach. It requires ongoing monitoring and periodic audit of safety performance (though it does not replace inspections, and enforcement actions when warranted).

Gary Moser and Doug Lewis, Fraser River Valley, British Columbia, May 2007

Before a company's SMS is audited, however, it must first be submitted to Transport Canada. New railway companies are required to obtain a Certificate of Fitness from the Canadian Transportation Agency in order to begin operations, and as part of this process, a potential operator is informed about SMS requirements. The operator must then submit its SMS plan to Transport Canada prior to start-up. Railways with existing SMS plans must also submit annual targets and updates to the department.

Transport Canada reviews these SMS plans but does not approve them, although the Minister has the authority to order changes to a company's plan under section 32.3 (1). Essentially, this means that a plan is "reviewed for potential to comply with the regulated requirement, and not to assess whether it is either appropriate, nor whether it will be effective."[7]

Once a company has its SMS plan in place, it is subject to periodic audits of the plan by Transport Canada. Information gathered during traditional inspections is useful for the audit process. For instance, audit findings can lead to corrective actions, or a need to learn more through inspections. Additionally, inspections can be used to confirm audit findings.

There is also an expectation under the SMS requirements that the companies themselves inspect and audit their own systems, making those results available to the regulator as part of audit or inspection processes. Conversely, positive audit results can mean a company will be subject to fewer inspections since safety risks are deemed to be lower.

Transport Canada's audit program was designed to periodically evaluate the effectiveness of a company's safety management system and whether or not implementation objectives were being realized. These "global" audits were cast at a higher level, and were performed on a three-year cycle. More recently, Transport Canada, Rail Safety has shifted its approach to conducting more "focussed" audits, where the scope is dependent on existing or potential compliance and safety issues. The Panel considers this approach to be promising and one that is moving in the right direction.

Nonetheless, Transport Canada's SMS audits remain essentially focussed on process. The Rail Safety Directorate's oversight program remains fundamentally prescriptive, and this continued focus on adherence leads to a tactical, inspection-oriented approach. Furthermore, audits tend to focus on technical and environmental factors, such as equipment reliability. Weaknesses exist in effectively auditing human and organizational elements. Accidents and incidents result from a combination of factors – human, organizational, technical and environmental – and there needs to be an understanding that strategies for mitigating risks must be developed at a systems level.

As already discussed, when auditing a company's SMS, Transport Canada generally seeks evidence of compliance with the regulated SMS requirements, rather than information regarding the performance of either the SMS or the company. In the absence of performance goals, Transport Canada does not evaluate a company's SMS plan to determine whether the safety management is appropriate, effective or results

[7] Kelly, SMS Aviation Safety, *Safety Management Systems*, op. cit., section 2.3.2, footnote 3.

in continuous improvement. It is, therefore, important that SMS audits include information on safety performance, and not just on processes.

Safety measurement based on performance goals is an important element of a well-functioning safety management system. As discussed in Chapter 6, information should be available to Transport Canada so that results can be measured with proactive indicators, rather than with reactive indicators (i.e., accidents, incidents, fatalities, injuries, etc.).

Using a performance-based audit system, a company could provide the indicators that "explicitly demonstrate that it is fully knowledgeable of the technical, operational, environmental, human and management hazards to which it is exposed; that it has the mechanisms to comprehensively and systematically manage these hazards proactively; and that there are systems in place to continuously evaluate the effectiveness of the company's risk management activities. A performance-based approach extends beyond mere compliance with safety standards."[8]

The principles of safety management and performance-based oversight are adaptable and can be applied differently depending on the nature of the organization. We understand that Transport Canada supports safety management systems that are appropriate to the size, scope and complexity of different organizations. Using a performance-based approach, companies, both large and small, can design their mitigation strategies based on their operations, so long as they are able to demonstrate to the regulator that those strategies do indeed lead to the desired and intended results.

At this time, to our knowledge, no SMS guidance has been specifically designed for small railway companies. Practical guidelines for smaller operations have been developed in other industries and may be adaptable to the railway industry. If developed for the short line industry, such guidelines could significantly facilitate its implementation of SMS.

The customized approach inherent in SMS allows smaller short line companies to present risk-based plans that may differ considerably from those of larger companies. Despite concerns about the ability of short lines to devote the resources needed to develop SMS, in our experience, short line railways were very interested in implementing effective safety management systems and had taken steps to do so.

Canadian short line railways also vary considerably in size and complexity of their operations. Size alone is not the best measure of risk – there are some very small operations that carry a significant number of passengers or that operate in environments that differ from larger railways only in scale. For these reasons, separate regulations applying to short line railways are not recommended.

[8] Ibid., section 4.3.1.

RECOMMENDATION 22

Transport Canada should focus its safety management systems audits to emphasize the assessment of the safety performance of railway companies.

Well-functioning SMS audits that focus on safety performance would allow Transport Canada to better manage its own oversight activities by requiring railway companies to demonstrate that they appropriately measure and manage the safety risks associated with their individual operations. Currently, Transport Canada generally seeks evidence of compliance with the regulated SMS requirements, but efforts must continue to adopt a "systems approach" to determining company safety performance. By shifting its audit approach, the regulator would be better positioned to assess not only the effectiveness and appropriateness of a company's SMS plan but also its overall safety performance. In a performance-based regulatory program, however, the railway company must also be able to demonstrate to the regulator that it proactively manages safety and the way in which it does so.[9]

Transport Canada's performance-based audits need to meet public service audit standards. This is key to providing companies with flexibility to manage safety according to their size and operations, including short lines and smaller operators.

We understand that the Rail Safety Directorate has developed procedures, guidelines and tools for SMS audits, though it is unclear whether these are in use or effective. The Panel understands that the Office of the Auditor General and the Treasury Board Secretariat also have documentation of widely recognized audit practices that are suitable for use within a regulatory framework. The Rail Safety Directorate should ensure that its own audit standards, in cooperation with Transport Canada regions, the railway companies and other stakeholders, meet the professional standards of public sector audits.

The standards should include the methodology governing the planning and conduct of compliance oversight activities, the reporting/evaluation of results and the resolution of observed instances of non-compliance. The standards and criteria should be published, and draft audit findings should be shared with the company being audited to validate the findings, and allow for constructive response, development of corrective measures, and eventual implementation of recommendations.

We would also point out that Transport Canada audit standards would apply to the SMS audits conducted by Transport Canada, not to internal or financial audits carried out by companies themselves.

[9] Ibid., sections 4.3.4-5.

RECOMMENDATION 23

Transport Canada, Rail Safety Directorate should ensure that audits of railway companies' safety management systems meet the professional standards of public sector audits.

5.5 RISK ASSESSMENTS

Once hazards and potential risks are identified, risk assessments then allow an organization to evaluate and plan for the mitigation of risks. They can be employed at various organizational levels. To be effective, risk assessments should be proactive, explicit, transparent, adaptable, credible and employed consistently.

At Transport Canada, risk assessments should continue to be used in risk-based planning of regulatory oversight. This approach is necessary for the efficient and effective use of resources since it would allow the department to focus its oversight action on companies or industry segments where the greatest risks exist.

Transport Canada, Rail Safety needs to develop an internal, analytical function to better plan and risk manage its oversight activities. The Panel believes that this is a necessary first step. The idea is developed further in Chapter 6.

Using this internal analytical capacity would allow Transport Canada to categorize railway companies, and identify those that had well-functioning safety management systems and were able to demonstrate their results. These companies would be subject to less intensive oversight. This would allow the department to focus its energy on companies with less robust SMS plans, meaning oversight would be carried out on organizations with the highest risks.

In June 2007, the Rail Safety Directorate adopted a new Integrated Oversight Model. When fully implemented, the model will allow the directorate to plan and prioritize its activities based on risk using data from a database currently under development – the Rail Safety Integrated Gateway. This model is certainly positive and implies that Transport Canada knows where it must go. Continued focus and effort are necessary, however, to ensure the department follows through to fully functional implementation of these initiatives.

With respect to risk assessments in industry, there can be disagreement between Transport Canada and the industry about when risk assessments are necessary. The railways tend to employ risk assessments when a change in operations is contemplated. From the Panel's experience, there are not many examples of risk assessments conducted on ongoing operations. Rather, risk assessments tend to be event-based and focus on technical aspects of operations. The identification and assessment of hazards and risks relating to human and organizational factors may be forgotten. As a result, mitigation strategies will not take into account the overall context within which problems occur.

Risk assessments should be conducted regularly for ongoing operations. They should not be reserved solely for when changes are being introduced. The industry is in need of guidelines for conducting risk assessments that provide direction for identifying and managing system hazards in human and organizational factors. Transport Canada and the industry should work together to achieve this.

Risk assessments are key to effective performance-based safety management systems. Currently, the Panel feels there is much room for improvement. System-level safety risk assessments would develop a safety profile of an entire company's operations. Safety profiles would then guide internal mitigation strategies and help regulatory bodies determine appropriate regulatory interventions.

In this chapter, we outlined how the implementation of SMS can be improved. Successful implementation will require collaborative efforts on the part of both the railway industry and the regulator.

Unlike legislation governing other industries, the performance goal of SMS is not currently articulated in the RSA, and it should be. Safety management systems should demonstrate how companies continuously manage their safety risks to a level as low as reasonably practicable. By including this objective expressly in the legislation, railways would be required to demonstrate that they systematically identify hazards and manage risks to achieve the best possible safety performance.

Transport Canada seems to consider that a railway is compliant with SMS requirements if the railway demonstrates that the processes and management systems outlined in the *SMS Regulations* exist. The shift to a performance-based SMS oversight approach would consider the process less, but look more at the results and outcomes of the processes. In other words, Transport Canada would look less at *how* a company got to an end result and more at *whether* it achieved results, and *what* those results mean.

The underlying premise of an SMS is that hazards are identifiable and the associated risks can be managed proactively. The Panel believes that the onus needs to be squarely on the railway companies to implement safety management systems, and to demonstrate their effectiveness to the regulator, rather than the regulator demonstrating that safety management systems are ineffective.

There seems to be consensus between industry and Transport Canada that performance-based concepts are necessary. There is disagreement, however, regarding how the industry demonstrates that it manages the safety of its operations.

Additionally, a well-functioning, performance-based regulatory program is based on a willingness of both industry and the regulator to work together collaboratively. It is worthwhile noting that the implementation of SMS has been affected by less than ideal relationships. This is why we are recommending that implementation of

SMS can be improved by the industry and the regulator working together in several key areas.

RECOMMENDATION 24

Transport Canada and industry should work together to develop the tools to assist railway companies in improving their safety management systems, including:

- **proactive safety performance measures;**
- **identification of the company data needed to support these measures;**
- **measurement of safety culture;**
- **guidance on company safety-risk profiles and risk assessments of ongoing activities;**
- **user-friendly safety management system tools for small railway companies;**
- **evaluation techniques to supplement existing audits and inspections; and**
- **a means of involving railway employees at all levels and, where possible, through health and safety committees and representatives.**

If implemented, these ideas would go a long way to building the strong relationships needed for effective safety management systems across the rail industry.

CHAPTER 6
INFORMATION COLLECTION, ANALYSIS AND DISSEMINATION

In order to advance safety, it is crucial for railway companies and regulators alike to have the right data at the right time. The importance of sound data for critical analysis and interpretation cannot be overstated. Similarly, providing clear information to the public on the state of railway safety is equally significant and plays a vital role in the development of public policy. Railway safety data collection, analysis and dissemination was a recurring theme brought to our attention throughout the consultations. Generally speaking, there is dissatisfaction from all quarters on this issue. As a Panel, even after using publicly available data from government sources and commissioning a statistical study,[1] we still experienced some difficulty in determining the true state of railway safety in Canada, due to deficiencies in the data.

In looking back at recommendations from previous reviews of railway safety,[2] we note that many of the same themes were raised, such as insufficient data, an absence of thorough analysis and a lack of performance indicators. Similar deficiencies still exist today. As noted earlier in our report, measuring railway safety using the data currently collected does not provide a comprehensive or unambiguous portrait of how safe the system is or should be. We fully recognize that measuring railway safety is a complex topic involving a number of various entities. Despite efforts over the years to improve upon this aspect of railway safety, we believe there is still much room for improvement and that a high priority needs to be placed on achieving results.

6.1 RESPONSIBILITIES FOR INFORMATION COLLECTION, ANALYSIS AND DISSEMINATION

A number of parties collect, analyze and disseminate railway safety statistics and information, including the Transportation Safety Board of Canada, Transport Canada, provincial governments and the railway industry itself.

As previously noted, the **Transportation Safety Board (TSB) of Canada** is an independent agency reporting to Parliament through the President of the Queen's Privy Council for Canada. Its main purpose is to advance transportation safety by

[1] Joseph F. Schulman, CPCS Transcom Limited, *The State of Rail Safety in Canada* (August 2007).

[2] Railway Safety Act Review Committee, *On Track: The Future of Railway Safety in Canada*, Report of the Railway Safety Act Review Committee (December 1994); and Transport Canada, *Review of Railway Safety Act Amendments and Safety Oversight and Regulatory Compliance Mechanisms: Report of the Transport Canada Project Team* (January 1998).

conducting independent investigations of railway, marine, aviation and pipeline accidents. Simply put, the mandate of the TSB is to answer three questions: What happened? Why did it happen? What can be done to reduce the risk of it happening again? Inherent in this process are the functions of identifying safety deficiencies, making recommendations to correct them and reporting to the public the results of investigations and findings. The TSB does not assign fault or determine liability, and its findings and recommendations are not binding on the parties implicated. There is, however, an obligation on federal ministers to provide formal responses to TSB recommendations in terms of action taken or planned.

The Board follows a rigorous investigation process including validation of information and facts to ensure fairness and accuracy in reporting before it publishes its reports on individual accident investigations. The TSB does not have the resources to undertake an in-depth investigation of all accidents. In rail for example, out of approximately 1,200 rail accidents per year, only a dozen or so are actually fully investigated and reported annually. Deciding to proceed to a full investigation largely depends on whether or not the TSB concludes the effort will result in advancing safety. It can take up to one or two years for an investigation report to be completed and made public.

Another important function fulfilled by the TSB is that of publishing, in aggregate form, statistics on transportation occurrences, consisting of both accidents and incidents. The TSB compiles monthly statistics reported to it and produces a year-to-date update and an annual report at the conclusion of each year. The data is disseminated to the general public through the TSB website. The Board is also required to report annually to Parliament on its activities. TSB data is the principal source of occurrence information used by other organizations such as Transport Canada.

Accident reporting requirements imposed on the transportation industry are spelled out in regulations to the *Canadian Transportation Accident Investigation and Safety Board Act*. The regulations define what constitutes a "reportable railway accident" and a "reportable railway incident." The regulations also stipulate what information must be reported to the TSB as soon as possible in the case of a "reportable" accident or incident. Such information includes the date and time of the accident, location, a description of the accident or incident, the extent of damage to rolling stock, and anticipated time of arrival of wreck-clearing equipment.

6.1.1 Transport Canada

Two organizations within Transport Canada are involved in collecting data that relates to the safety of railway operations – the Rail Safety Directorate and the Transport Dangerous Goods Directorate. As part of its mandate for regulatory oversight of Canada's railways, the Rail Safety Directorate requires industry to

report information to the department on matters specific to safety management systems. In addition, railway safety inspectors have the power to request documents and/or information for the purposes of ensuring compliance with the *Railway Safety Act* (RSA). The Directorate also collects various information from industry and elsewhere in order to track the activities of the industry and its own railway safety inspectors for internal planning purposes.

A data system being developed in the Rail Safety Directorate, known as the Rail Safety Integrated Gateway (RSIG), will draw upon a variety of information sources, both internal and external, and help the Directorate with trend analysis, risk management and decision-making activities related to such things as targeting safety inspections and deployment of its resources. For accident data, rather than create a duplicate database, the Directorate mainly relies on the TSB database. The Directorate does not undertake any formal accident investigations, as this is the domain of the TSB, but it may investigate for compliance with rules, regulations and standards as established under the RSA.

The second organization within Transport Canada which actively collects railway safety information is the Transport Dangerous Goods Directorate. This directorate is the federal regulator for the handling and transport of dangerous goods and the principal source of information on occurrences involving dangerous goods, not only for rail but also for the other modes of transportation. Under the *Transportation of Dangerous Goods Act* and its regulations, an accident-reporting regime has been established principally so that a response to any actual or potential spill can be immediately initiated. The Canadian Transport Emergency Centre (CANUTEC) is operated by Transport Canada to assist emergency response personnel in handling dangerous goods emergencies and also acts as an information and research centre. The Transport Dangerous Goods Directorate is therefore in a position to collect, maintain and disseminate information on dangerous goods occurrences and make this information available to users.

In addition, Transport Canada annually produces *Transportation in Canada*, in which it reports in summary format on its yearly activities, and in which there is an array of statistical information covering all transportation modes. However, when it comes to railway safety information, there is little in the report outside the TSB rail occurrence data.

6.1.2 Provinces and Industry

Provincial authorities, to varying degrees, record information related to railway activity, including accident data for railways that fall under their jurisdiction. Due to the limited authority of the federal government over all railway operations in Canada, as discussed in Chapter 4, there is no requirement for provincially regulated railways to report accident information to a federal agency such as the TSB

or Transport Canada. Nevertheless, the TSB collects data from some provincially regulated railways, but does not mix or publish it with data collected from federally regulated railway companies.

Individual railway companies record safety data for their own purposes, usually as part of their internal processes for effective management. Safety data related to individual railway operations is vital for the company to self-assess, maintain a safe operation, gauge performance, plan maintenance activities and reduce risk. On behalf of its members, the Railway Association of Canada collects and disseminates annual industry statistics. For example, its annual report, *Railway Trends,* contains an industry snapshot of railway safety, along with many other indicators of railway operations in Canada.

6.2 DATA DEFICIENCIES

There are three distinct yet intertwined phases associated with the statistical assessment of railway safety – data collection, data analysis and information dissemination. Advancing railway safety must involve all three phases and be a common objective, contributing to public safety, safety of railway employees, protection of property and the environment, and also benefiting railway companies in terms of efficiency and profitability.

During our consultations with stakeholders, and through additional research studies, we received a consistent message that the existing state of railway safety data does not adequately reflect or help advance railway safety to the extent necessary, due to a number of shortcomings. Deficiencies in data collection, analysis and dissemination were frequently pointed out.

There is a widely held view that the TSB's published data on railway occurrences does not provide a comprehensive or fully accurate picture of railway safety in Canada. For example, there can be problems for railway companies in interpreting the reporting requirements set out in the TSB regulations. The railway has to determine if, as a result of an accident, rolling stock sustains damage that affects its safe operation. There can be ambiguity in how this is determined and how consistently it is determined within a company and among many companies.

Recently, it came to light that due to a difference in interpretation of the TSB reporting requirements, the CN data going back to 2002 had been under-reported. This required a revision to the statistics covering the five-year period to 2007. Any ambiguities from this period would most often be related to more minor types of incidents. As a result of this situation, we understand that the TSB is in the process of revising its accident/incident reporting regulations and that they should come into effect in 2008.

The TSB largely relies on the railway to report occurrences to it, without any structured or consistent process for validation or challenge of what is being reported to the Board. Most frequently, a railway company accident is not formally investigated by the TSB and assigning a cause of the accident is left to the individual railway company. Often the cause is not immediately known and is left blank when data is initially reported to the TSB. All too frequently, the cause is never reported to the TSB; it does not follow up to determine the cause and, therefore, the occurrence database is left incomplete. For example, the number of main track derailments in the TSB database that were not coded with an attributable cause grew from less than 10 per cent in 1999 to close to 50 per cent by 2006 – hence the database limits insights and conclusions that can be drawn.[3]

Also brought to our attention were problems associated with the lack of severity indicators that would help gauge the gravity of an accident. The only apparent indicator reported is the number of rail cars derailed per accident, but this says little in terms of the accident's severity or actual consequences. A rail car, whose wheels leave the track at slow speed, but which remains upright, is counted the same as a car travelling at high speed that falls on its side and spills its contents across the track. In the U.S., under the Federal Railroad Administration (FRA) reporting requirements, the main criterion for reporting a railway accident is that damage to railway equipment exceeds a specific dollar value (currently standing at US$8,200).[4] This gives some limited insight into severity.

Canada does not use dollar value as a reporting criterion or as a severity indicator. Unless ranges for the value of damage were introduced (e.g., $8,200 - $15,000; $15,000 - $50,000; $50,000 - $200,000; etc.), a simple single threshold value adds little to understanding degrees of severity. On the other hand, one of the benefits of using a dollar value as the basis for reporting an accident is that it is clear, assuming the damage is easily assessed, and can be readily translated into monetary terms. The Panel favours the exploration of new ideas for illustrating the severity of railway accidents in Canada.

The criteria for reporting accidents and incidents in Canada are less precise than those in the U.S., where a threshold dollar value is used. Canadian criteria are more open to interpretation by the railways as mentioned above. To be reported to the TSB, the regulations stipulate that rolling stock must sustain damage that affects its safe operation.

[3] G.W. English and T.W. Moynihan, TranSys Research Ltd., *Causes of Accidents and Mitigation Strategies* (July 2007), Figure 2; section 5.1.

[4] A FRA reportable accident includes any collision, derailment, fire, explosion … that results in total damages to all railroads involved greater than the current reporting threshold. The threshold value is periodically updated by the FRA to reflect cost increases. In 2007, the threshold was raised from US$7,700 to US$8,200 and includes damages to rolling stock as well as signals, track, track structures or roadbed including the cost of labour.

The phrases, "safe operation," or "poses a risk or threat," introduce a subjective element into the determination of whether an accident or incident is reportable. Clear guidelines issued by the TSB and understood by the railways would be needed to accurately capture the data. Unfortunately, this is not the case as we have seen in the TSB's recent experience with CN data.

Generally speaking, comparing Canadian and U.S. railway safety data as collected by national authorities is like trying to compare apples and oranges given the different reporting requirements of each national authority. Canadian railways are required to report to U.S. authorities on their U.S. operations according to U.S. reporting rules. For comparison purposes, the companies also record whether an accident occurring in their Canadian operations would meet the U.S. reporting threshold.

TSB DEFINITIONS:

"reportable railway accident" means an accident resulting directly from the operation of rolling stock, where

(b) the rolling stock

(iv) sustains damage that affects its safe operation, or

(v) causes or sustains a fire or explosion, or causes damage to the railway, that poses a threat to the safety of any person, property or the environment;

"reportable railway incident" means an incident resulting directly from the operation of rolling stock, where

(a) a risk of collision occurs,

(g) any crew member whose duties are directly related to the safe operation of the rolling stock is unable to perform the crew member's duties as a result of a physical incapacitation that poses a threat to any person, property or the environment

Transportation Safety Board Regulations (SOR/92-446)

Using accidents per million train miles, where accidents are defined in accordance with U.S. criteria, CN and CP compare favourably to U.S. railways, based on their overall North American operations.[5] It is interesting to note that if the U.S. definition of accidents were adopted in Canada instead of the TSB criteria, the number of TSB reportable accidents would drop by 90 per cent or more.[6] We believe that analysis of accidents is enhanced by having more data, not less, and would not be in favour of revising accident reporting criteria or severity indicators that would result in fewer reported accidents and incidents than is the case under current TSB requirements.

The data normalization measures employed are inadequate to reflect workload changes in the railway industry over time. Tonnage carried by the railways has steadily

[5] Schulman, *State of Rail Safety*, op. cit., section 8.

[6] Ibid., section 7.3.

risen[7] and outside third party influences, such as urban growth, have resulted in greater opportunities for human/vehicular interfaces with railway rolling stock. At present, the most common measure used to normalize the number of accidents into a comparable rate of accidents, taking into account changes in the amount of rail activity, is the accident rate per train mile, usually expressed as accidents per million train miles.

Number of train miles is not the only activity measure that can be used to normalize the data. When using accidents per million train miles, it becomes evident that the data provides almost no additional knowledge concerning railway trends over time, as the figures simply mirror the absolute number of accidents per year.[8] It would be useful for decision makers to have a more informative basis for normalization of the number of accidents in the railway industry. Using billion gross ton miles, for instance, has been suggested as a promising alternative for freight movements and one that can capture changes in railway workload and productivity, such as heavier train loads.[9]

Another limiting factor is that TSB data reflects only information obtained from federally regulated railways and does not capture the entire population of railway operations in Canada, which also includes many provincially regulated railways.[10] Furthermore, the size of the industry is not well accounted for in the data because of changes in the number of railway companies under federal jurisdiction, which can vary as federal lines are abandoned, provincial short lines are created, or, as in the case of BC Rail being acquired by CN, large provincial railway operations are absorbed into the federal domain. To our knowledge, the accident data is not adjusted to accommodate such circumstances.

While the TSB produces excellent detailed accident investigation reports and is recognized as a world leader in accident investigation methods and procedures, it can only manage to undertake a small fraction of accident investigations in any given year. Recognizing that the Board can issue interim recommendations or safety advisories, the Panel is concerned that it often takes one to two years for a final accident report to be produced and published, thus slowing the flow of information

[7] From 1995 to 2005, the volume of tonnage carried by the railway sector in Canada increased approximately 25 per cent. Traffic increased from 292 million to 368 million tonnes of rail freight from 1995 to 2005. See Transport Canada, *Transportation in Canada 2006, Annual Report Addendum* (May 2007), Table A6-8.

[8] Schulman, *State of Rail Safety*, op. cit., section 3.1.

[9] Ibid., section 9.2.1.

[10] However, it should be pointed out that if a provincially regulated railway has an accident while operating on federally regulated track, such an accident is required to be reported to the TSB, in accordance with its accident reporting regulations.

to the public – a public that can become anxious when it witnesses a high-profile accident or recurring accidents in the same geographic area.

With its inherent problems, railway safety data, therefore, presents numerous challenges when trying to analyze its true meaning. Further, the TSB is not responsible for safety oversight and cannot be expected to conduct detailed analysis of the data and trends that should feed into safety policy, regulations, oversight and corrective measures – this is largely the domain of the regulator.

The authors of two of the research studies that we commissioned criticized Transport Canada, Rail Safety Directorate for doing too little in the way of systematic data-gathering and analysis and for being reactive rather than proactive.[11] For railway occurrence data (both accidents and incidents), the Rail Safety Directorate relies largely on information obtained from the TSB database – a source of information that has limitations, as described above. On the other hand, railway companies complain that Transport Canada makes too many ad hoc requests for information without adequately communicating why the information is being requested – whether it is part of an audit, an inspection, or an investigation, or is related to safety management systems monitoring. Railway companies also complain of a lack of feedback from the audit and data collection activities conducted by the regulator. There does not seem to be a coherent approach to data collection in the Directorate.

More open communication between Transport Canada and companies is needed in this regard. More fundamental, though, is the absence of a steady flow of the right information and data for policy development and regulatory oversight purposes. As pointed out by the researchers, there seems to be limited analysis of the data by Transport Canada and an absence of effort to assess the overall safety performance of the railway industry.[12]

Beyond re-quoting TSB occurrence data, no other indicators are publicly available to give insight into whether the railway system in Canada is safe or is getting safer. While the department does use data collected from various sources to help set internal priorities, target inspections and regularly monitor railway company compliance, more needs to be accomplished at the macro level to report these results to a broader audience. For example, setting performance targets with the industry and having it demonstrate continuous safety improvement to the regulator, both as an industry and by individual company, can help transform a philosophy of "accidents happen" into a more proactive attitude.

[11] English and Moynihan, *Causes of Accidents*, op. cit., section 5.1; Milt Poirier, QGI Consulting Ltd., *Performance Measurement in Railway Safety* (July 2007) section 6, "Transport Canada."

[12] English and Moynihan, *Causes of Accidents*, op. cit.; Poirier, *Performance Measurement*, op. cit.

Direction 2006, the 10-year program to reduce rail crossing and trespassing accidents by 50 per cent, may not have fully achieved its goal. Nevertheless, it resulted in significant reductions through education, engineering, research and enforcement. It is the view of the Panel that the railway industry, with the support of regulators, needs to demonstrate the same continuous advancement in safety as it does in cost efficiencies.

It is also necessary for the regulator to acquire information from individual railway companies in order to fulfill its regulatory oversight role, whether through inspection, investigation or audit activities. Difficulties in obtaining safety-related information from companies have been experienced, whether due to a lack of clarity in the regulations or in the rationale for requesting the information. The railway industry has been criticized for being uncooperative in providing data or making it more difficult than necessary for inspectors to obtain data.

Railway companies have been moving towards highly technical applications in generating data from inspection activities related to monitoring track and equipment, and processing this data for purposes of planning a proactive maintenance program. The industry also conducts internal investigations into accidents and incidents. Such processes and information should assist industry in streamlining the reporting of necessary information to regulatory authorities in a timely fashion. We recognize that many small railways may not be as capable as larger railways of capturing and reporting data electronically to the regulator, and therefore, reasonable accommodation should be provided in such cases.

One element not considered within our mandate is railway security. There may also be security data requirements that need to be considered and possibly incorporated into any revised railway safety data collection and analysis activity of Transport Canada. The issue of limited departmental resources was also brought to our attention as a factor in how much can be achieved within the existing Rail Safety Directorate's suite of responsibilities. We address this issue more fully in Chapter 11.

6.3 DATA COLLECTION

As we heard during our consultations and through numerous written submissions, the data collected by government entities, principally the TSB and Transport Canada, does not provide an accurate or comprehensive view of railway safety in Canada and focuses mainly on accidents and incidents. Transport Canada accesses the TSB database for railway occurrence information, and supplements it by collecting data on activities related to its regulatory oversight role. The department also maintains a separate database for dangerous goods accidents. This information is not collected and coordinated with the goal of providing Transport Canada, Rail Safety Directorate with the capacity to effectively monitor the overall safety of the industry or assess the effectiveness of its programs, regulations, rules and standards.

The current data does not allow the regulator to assume its full responsibility, and immediate effort is needed to determine what information is required to satisfy government entities and to assist the industry in pursuing safer railway operations.

At present, there is an absence of meaningful performance measures and proactive/predictive indicators of safety. To rely on limited TSB accident data does not provide a sufficiently thorough understanding of railway safety from a broad public safety perspective. It is necessary for Transport Canada to consider the range of railway safety information needs on behalf of the government. Coordinating the effort and working closely with all involved to determine these needs will be important in achieving a data collection and reporting protocol that is predictable, regular and electronically supported. This should also reduce the need for the regulator to make ad hoc requests of the industry for information. When required to do so, such requests should be fully explained and justified.

Ultimately, Transport Canada is responsible to the Government of Canada and the public for a safe national railway system and, therefore, the department must be at the centre of the effort to understand and interpret the data, and to translate it into policies, programs and regulations that advance railway safety.

The TSB should continue with its mandate of investigating and reporting on accidents, but it is not necessary for it to collect railway accident data – the regulator should assume this role. Other countries separate these two roles, one of the reasons being the maintenance of neutrality of the investigative body. It is not necessary for such a body to be involved in the collection and analysis of the data that feeds back into the regulatory process.

Examples in other jurisdictions where data collection and analysis is much more advanced include the U.K. Rail Safety and Standards Board (RSSB) and the U.S. Federal Railroad Administration (FRA) Office of Safety Analysis.

The FRA maintains a database on its website for the purpose of making railway safety information readily available to a broad constituency that includes FRA personnel, railway companies, research and planning organizations and the public. Nearly 700 railways report information to the FRA and data queries can reach back 10 years or more for trends. A portion of the database is secure and accessible only to FRA staff. Visitors to the public website have access to a wide array of railway safety information covering accidents and incidents. For example, data for accidents by railway company and by state, for number of inspections and for highway-rail crossing accidents are readily available. Users can download a variety of safety database files, order publications, and view current statistical information on railroad safety as they require. The FRA and stakeholders work together to make changes to the database and proposed changes go through the normal Notice of Proposed Rulemaking process for comment before changes are finalized.

The U.S. National Transportation Safety Board (NTSB), which is similar to the Canadian Transportation Safety Board, conducts investigations into transportation accidents, including those involving railways. NTSB final accident reports used to take approximately two years to be published, but the Board has since reduced this to 15 months and is targeting 12 months. Factual reports written by NTSB investigators are usually available to the public within six months after an accident. The NTSB does not investigate close calls or near misses; nor does it collect railway accident data.

The RSSB is a not-for-profit company, owned by the major railway industry stakeholders in the U.K., and independent of any individual railway company. Its mission is to lead and facilitate the industry's work to achieve continuous improvement in the health and safety performance of railways, and to facilitate the reduction of risk to passengers, employees and the public. It produces an annual safety performance report that analyzes, measures and communicates the industry's safety performance and contains a comprehensive statistical analysis for a wide range of safety performance indicators. The Rail Accident Investigation Branch is a separate independent organization in the U.K. that investigates railway accidents and incidents. The main regulatory body is the Office of Rail Regulation, whose principal function is to regulate the national rail network.

Canada may benefit from examining these and other jurisdictions with respect to accident investigation, data collection processes and activities, as well as ways of measuring railway safety performance.

RECOMMENDATION 25

Transport Canada should be responsible for railway safety data collection and ensure that the needs of government agencies are met and that there is no duplication or confusion for reporting entities and stakeholders. There should be a regular timetable for reporting, and ad hoc demands for information or requests must be accompanied by valid reasons and should be kept to a minimum.

The foundation of any database consists of collecting appropriate information that will be subjected to analysis and will generate meaningful interpretations designed to address underlying questions. In this case, the objective is railway safety and the desire to monitor and continually improve upon safety performance. To assess the safety performance of an organization or an industry requires an appropriately selected "basket of measures." Data can be drawn from a variety of sources, so it is important to understand what the objective is from the start, what performance indicators are important and useful and how the information can be collected and analyzed. In a railway safety setting that involves both private companies and public safety entities, joint cooperation and action is necessary to achieve this common goal.

The Report of the 1994 review of the *Railway Safety Act, On Track: The Future of Railway Safety in Canada*, pointed to the need for the regulator and industry to work together towards assessing data requirements and collecting and analyzing data in order to produce meaningful performance standards so that the regulator could perform its role and industry could be held accountable for safety plans.

The 1998 *Review of Railway Safety*, found that, "current data and analysis do not provide an adequate basis for determining past influences on safety nor predicting future safety performance," and "railway safety management system information, important for assessing system health, is not reported to or collected by Transport Canada." Further, "limited analysis is performed with existing data largely due to resource pressures," and "research on safety issues is also limited."

Despite earlier observations and recommendations, to date, it appears that little action has been taken to establish this essential foundation. Our view of railway safety is that it cannot be advanced if you cannot rely on accurate, robust and timely data. As pointed out earlier, except for a few cases, railway safety is not generally improving to the degree necessary, particularly when it comes to main track derailments and non-main track accidents. A collaborative approach between regulators and the industry in determining data requirements is strongly encouraged. As lead regulatory authority, Transport Canada should address data collection and analysis issues, including the range and type of data required, reliability of data, normalization factors, the capture and use of untapped railway safety data, as well as establishing new measures of industry performance.

RECOMMENDATION 26

Transport Canada should give the highest priority to putting in place a robust program of data collection and analysis in order to measure railway safety performance, and should be provided with the necessary resources to do so.

An important consideration for government agencies is to ensure that industry is not overburdened with multiple or duplicate reporting requirements. The filing of information should be made as simple as possible. Any paper-based reporting is inefficient, can lead to transcription errors and should be eliminated to the extent possible. One comprehensive railway safety database would help achieve a number of objectives and eliminate some of the problems discussed earlier. Establishing a secure database, available to "licensed" stakeholders on a shared basis, and enabling automatic reporting and updating with online access, could meet the needs of both government entities and industry. Creating a public access component to extract data is also envisioned.

RECOMMENDATION 27

A secure electronic database should be established to enable electronic filing of railway safety data by railway companies.

When a railway accident occurs, many parties need to be notified. Railway companies maintain up-to-date call-out and notification lists involving federal, provincial, local and private entities, as do the emergency response plans of local and provincial organizations. Immediate reporting of accidents is important in order to mount an adequate response to the emergency as soon as possible. At present, there is no central reporting requirement for all railway accidents, as is the case for accidents involving the transportation of dangerous goods.[13]

In an effort to capture the entire picture with respect to railway accidents, it is preferable for all such accidents to be reported to a central point from which other levels of government and agencies can be notified. As described in greater detail in Chapter 8, there is a need for improved coordination of response to railway accidents that can involve many entities, from first responders such as local fire, ambulance and police departments, to national and provincial government organizations.

RECOMMENDATION 28

Transport Canada, in consultation with other departments and agencies, should create a one-stop reporting system for immediate reporting of accidents and for disseminating that information throughout all levels of government and agencies.

While some provincially regulated railway safety data is collected by the TSB, it is not reflected in the TSB published statistics. The TSB data cannot therefore reflect the performance of the railway industry as a whole. This is not sufficient for the regulator to gain a full picture of railway safety in Canada. As discussed above, it would be useful for the Rail Safety Directorate to monitor overall safety – something that it cannot currently do by relying on partial data collected either by itself or by the TSB. The Rail Safety Directorate must become a comprehensive data centre in which provincial railway safety data is also collected and assessed.

> The addition of provincial data should improve the identification of safety issues for the rail industry in Canada and more specifically for the shortline railway industry.
>
> Government of Nova Scotia Submission, page 6.

The regulator needs to gain a view of the entire railway system, particularly when there are running rights and agreements between federally regulated and provincially regulated railways and when provincial railways operate over

[13] As mentioned previously in this chapter, CANUTEC acts as a reporting centre for accidents involving dangerous goods.

federal track. Recognizing that the federal authority does not extend over all railways in Canada, Transport Canada should work with provincial and territorial authorities responsible for railway activity, ideally through the Federal-Provincial Working Group on Railway Safety referred to earlier. Together, they should consider a program of capturing and reporting on provincial railway safety data in order to monitor and understand national railway safety in a more comprehensive manner.

RECOMMENDATION 29

Transport Canada should work with the provinces to develop a comprehensive database, including both provincial and federal railway safety data.

The information-gathering powers of a railway safety inspector are found in s. 28 of the RSA. For the purpose of ensuring compliance with the Act, regulations, rules, and orders, inspectors can "carry out any inspection" that may require the railway "to produce any document for inspection" and may copy or seize any property with respect to administration and enforcement of the Act. This section of the Act, as currently written, limits the inspector's ability to fully and efficiently carry out the duties necessary for the department to monitor and assess industry compliance. Rather than having to go on site, the railway safety inspector should have the authority to request information under this section from any location and have it made available through electronic means, if it exists in that format.

The intent is not to create more work for the railways or insist that hard copies of documents need to be converted into electronic form, but rather to facilitate reasonable requests from railway safety inspectors in the course of their duties. Commercially sensitive information would not normally be required, and if so, could still be kept confidential by Transport Canada under *Access to Information Act* provisions. Timely response from the railway company is also an important requirement to enable an inspector to conduct his duties. The purpose of these proposed amendments is to streamline their work. They are not intended to enable inspectors to pursue more ad hoc requests for data, as these should be reduced through the creation of a regularized data-reporting requirement referred to in earlier recommendations.

RECOMMENDATION 30

Section 28 of the *Railway Safety Act* should be amended to clearly state that:

- a railway safety inspector, for the purposes of exercising an audit or inspection function, may require any person to provide information or copies of any existing documents in any format (electronic or hard copy) specified by the railway safety inspector;
- the request may be made from any location for documents stored at any location; and
- the regulated party must provide the requested information or document in a timely manner.

6.4 DATA ANALYSIS

Understanding how railway safety data will be analyzed, what indicators are important and how performance will be measured are issues that need to be considered as part of the process of determining basic information and data collection needs. These issues must be considered in a collaborative manner between the industry and government entities interested in understanding and advancing railway safety – thus ensuring that data collection and analysis are not separate activities when planning a robust information system. It is key to establish, early in the process, how the raw data will be utilized to produce meaningful measures of performance, trends and benchmarks. Rather than relying on data that has been traditionally collected, new measures of performance, benchmarking and leading indicators need to be creatively considered and established through a collaborative effort.

By establishing performance standards, the Rail Safety Directorate could use them to gauge overall compliance with railway safety regulations, rules and standards and thereby be able to target front-line safety inspections and SMS audits. Such standards could also be useful in considering where changes to existing regulations and rules may be needed and determining if safety of the railway industry is improving. The move to performance standards should eventually lead to fewer prescriptive rules and regulations and a greater reliance on SMS. Setting targets based on sound performance measures benefits both the regulator and the industry in that such targets represent goals to be achieved. Measurement in any management process is key to continuous improvement.

Existing measures have traditionally focussed on outcomes commonly expressed in terms of accidents and injuries – reactive to past events rather than forward-looking measures (i.e., leading indicators), such as those used in business (sales projections, return on investment or expected profits). Measures, both reactive and proactive,

that reflect the breadth of the railway industry are required to effectively understand safety performance. Well-designed measures should be accepted by, and meaningful to, those involved in the activity being measured and those who need to use the measures. They should be simple, unambiguous, understandable, repeatable and objective. They should also be capable of showing trends, be cost-effective in terms of data collection, and provide timely information for decision-makers.

In economic terms, a leading indicator is a measurable factor that changes before the economy starts to follow a particular pattern, and is used to help predict changes in the economy.[14] In railway safety, the identification of leading indicators is made more difficult because so many variables affect railway safety, including capital spending, employee work schedules and overtime, quality of employee training, track and equipment employed, and weather conditions. Nevertheless, it should be possible to identify some leading indicators worth tracking in order to be more predictive and proactive regarding railway safety.

For example, capital expenditures on track infrastructure and track inspection information may be correlated with track-related accidents and incidents. Train accidents due to human error may benefit from analysis of the amount and quality of the training provided to operators, their knowledge of the rules and observations of unsafe behaviours. Examining near misses and incident data also has potential. Determining whether a strong linkage exists between the data collected and the leading indicator would require commitment of resources. Developing some leading indicators should be considered in conjunction with other performance measurement activities that we have suggested. Benchmarking and trend analysis are vital in maintaining and enhancing railway safety and should be addressed by both the regulator and the industry as a "value-added" task.

> Relevant and up-to-date statistics are critical for all stakeholders in order to make appropriate safety risk assessments and regulatory enforcement decisions. ... TSB statistics have limitations for properly assessing safety performance and safety risks.
>
> Railway Association of Canada, *RAC Submission to Panel* (February 2007), page 17.

It is our belief that the Rail Safety Directorate needs to establish a strong, centrally located office of railway safety data analysis that would integrate the data from such sources as regional and national audits, SMS, inspections and evaluations, rail accident investigations, coroner reports, railway companies and public complaints. The Rail Safety Integrated Gateway (RSIG) database is a natural starting point, but to fulfill this enhanced role the Directorate requires sufficient and trained personnel. The data then could be shared widely

[14] Schulman, *State of Rail Safety*, op. cit., page 33.

outside the Directorate with the TSB, other parts of Transport Canada, provincial authorities, industry and the public.

As mentioned earlier, in 1994, the authors of *On Track* and the 1998 *Review of Railway Safety* recommended that the regulator needed to fulfill its role as a monitoring and auditing organization by collecting and analyzing data and producing performance indicators to measure success. At present, we detect an impasse between the regulator and the industry with respect to determining what information is required and how it will be captured and shared. Industry feels that there are too many ad hoc requests for information from Transport Canada and requests for information that are questionable in terms of the regulator's role. On the other hand, Transport Canada believes that it is entitled to any information it feels is required under the RSA.

The parties need to move beyond these viewpoints and look at the need for information from a more holistic perspective, incorporating rigour and predictability. A collaborative effort is needed to develop a national, systematic approach to data collection and analysis, based on transparency, trust and a sense of common purpose. To succeed, the task should not become bogged down due to ingrained positions or lack of a specified completion date.

The RSA provides the Governor in Council authority, under section 37 (Maintenance and Production of Safety Records), to make regulations pertaining to filing with the Minister information suitable for monitoring safety performance or predicting potential changes in levels of safety. This provision of the Act has not been used by the regulator, as there are no regulations in place. As discussed above, a well thought-out, comprehensive set of data requirements capable of producing relevant information and performance indicators of the state of railway safety in Canada would be beneficial.

Railway companies would know what is required of them and could accommodate regular information submissions rather than reacting to ad hoc information requests. Companies would establish more definite targets to improve safety and the regulator could gauge progress, assess the impact of its actions more scientifically through trend analysis, and make necessary corrections at a systems level. In addition, the Rail Safety Directorate would be better positioned to target inspections, conduct audits and justify rule-making and regulatory decisions more effectively. Using section 37 may be the appropriate route to enshrine data collection and analysis requirements.

As was recommended above, Transport Canada should give the highest priority to putting in place a robust program to measure railway safety performance leading to an enhanced focus on trend analysis, risk reduction, and strategies to address problem areas. As demonstrated through targeted programs, such as Direction 2006

and a vigorous transportation of dangerous goods regime, reductions in crossing accidents and rail occurrences involving dangerous goods have been accomplished. There is reason to believe that such a focus can be extended to railway safety with similar results. As with data collection, the establishment of performance measures and data analysis needs a collaborative approach between the regulator and the industry so that meaningful output can be agreed to, accepted and acted upon.

RECOMMENDATION 31

Transport Canada should take a more active role in trend analysis and benchmarking of railway performance. This should involve a collaborative approach with government and industry stakeholders to develop appropriate and meaningful measures of risk and safety performance. To this end, Transport Canada must work with stakeholders to:

- **define data requirements;**
- **develop reporting and data sharing mechanisms;**
- **develop regulations requiring the industry to report data and performance measures; and**
- **publish safety performance results.**

6.5 INFORMATION DISSEMINATION

Communicating safety information to the public is an important function of government, both from the standpoint of accountability and transparency and to advance safety. Demonstrating to all stakeholders that railway transportation is safe, particularly when so many large and small communities are bisected by railway lines carrying all types of cargo, helps to dispel any suggestions by the media that the system may be unsafe – something that can occur after a dramatic railway accident or series of accidents. On the other hand, if members of the public consider a system to be unsafe, they may become more engaged and participate in the development of public policy.

In a railway safety context, publicly reporting information involves both the regular dissemination of statistical and performance data and reporting on the causes of specific accidents. At present, the TSB is the prime disseminator of accident data and accident investigation reports. If our recommendations for an enhanced role for the regulator were to be implemented, Transport Canada would be responsible for providing regular statistical information on railway safety to Canadians. The TSB would continue with its present role of producing and publishing accident investigation reports.

It is also necessary to provide the public with reliable, unbiased, factual information on individual railway accidents as soon as possible, to allay any fears or misconceptions about what happened. This is better than creating uncertainty, which encourages media conjecture and the potential for exaggeration of the relevance of individual occurrences. Waiting months or even years for an official investigation report to be issued does not adequately serve the public interest. While the detailed investigation reports are very useful and should continue, there is a need for the TSB to issue statements of fact as soon as practical after all significant accidents (e.g., those involving loss of life/serious injuries, environmental damage, having a high public interest, or exhibiting abnormal circumstances) in a similar fashion to the accident briefs issued by the U.S. National Transportation Safety Board.

Providing meaningful information on railway safety data and performance, including reporting on the performance of individual railways, aids in transparency and accountability on the part of the railway and the regulator and can help them to achieve greater safety. It should not be problematic to publicly identify individual company performance if the data is treated with rigour, is reliable and portrays meaning, and if the regulator and the industry have agreed on reporting parameters and protocols. Public opinion can often lead to positive action with respect to safety matters when the principals involved strive to make needed improvements.

Reporting on enforcement activities and specific infractions that are serious enough to put the public or environment at risk should be made public. Transport Canada already issues information for some of the other transportation modes on enforcement and compliance actions. This information includes fines that are levied against marine polluters and aviation operators, and indicates when certain Air Operator Certificates have been revoked. It is the view of the Panel that public safety is enhanced when such information is communicated to a wide audience and that the effect of public opinion on influencing railway safety should not be ignored.

RECOMMENDATION 32

To ensure that the public is informed on rail safety issues, the Government should make public:

- **purely factual information on a significant rail accident as soon as possible after the occurrence;**
- **railway safety performance data (including information by company); and**
- **information on enforcement actions.**

One of industry's concerns is that if it provides information to the government, that information becomes subject to the *Access to Information Act* and is accessible by request from the public. While it is true that the information collected by Transport

Canada would fall under the Act, the Act also provides certain protections to third party[15] information. Basic tenets of the *Access to Information Act* include transparency and accountability. The Panel strongly opposes any effort that would use the Act to prevent safety problems from coming under public scrutiny, since railway safety is improved, not by keeping information secret, but through accountability and transparency.

At the same time, we understand that some information collected by the TSB and the aviation mode of Transport Canada may be excluded from disclosure by statute or regulation for the purposes of conducting a thorough investigation. We have some sympathy with industry's position that only information necessary for the administration and enforcement of the RSA should be collected by the regulator, and that there may be circumstances that warrant its protection once collected and in the government's possession. Both Transport Canada and the railway industry should review this issue and clarify the rights and obligations of each party.

RECOMMENDATION 33

Transport Canada, in consultation with industry, should determine whether, and to what extent, information provided by a railway company under the *Railway Safety Act* should be privileged information.

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[15] " 'Third party', in respect of a request for access to a record under [the] Act, means any person, group of persons or organization other than the person that made the request or a government institution," *Access to Information Act* (R.S., 1985, c. A-1), s. 3. Provisions related to how government institutions must handle third-party information are set out in section 20 of the Act.

CHAPTER 7
PROXIMITY ISSUES


Wetaskiwin, Alberta, April 2007

During the Panel's cross-Canada consultation process, we experienced first-hand a vivid example of the risks of proximity when trains and people interact. Travelling from Calgary to Edmonton in a CP track evaluation car, we had stopped briefly near a crossing at Wetaskiwin, Alberta, where there are schools and residential and commercial development on both sides of the railway tracks. It was mid-afternoon, and students were emerging from school. We watched as a young boy, not more than 10 years old, with his bicycle and backpack, attempted to crawl under a tank car in a freight train that was waiting for the main track to clear. A waiting motorist honked, and a railway employee came to reprimand the boy. In the meantime, while we watched in horror, an older boy left a group of children waiting at the crossing and climbed over the couplers between cars mere seconds before the train started to move again. We were told that such incidents are daily occurrences for the railways.

The near tragedy described above has served as a constant reminder to us of one of the primary objectives of the *Railway Safety Act* – to promote and provide for the safety of the public. It clearly demonstrated that the encroachment of new development near railways, along with heavier highway and rail traffic, leads to the increased interaction of people and trains and inevitable proximity issues. We believe, however, that these issues can be at least partially resolved by good community outreach on the part of the railway companies, and the enhancement of ongoing public education and contribution programs.

7.1 NEW DEVELOPMENT NEAR RAILWAY PROPERTY

During the 19th century, many communities in Canada sprang up around railways – their link to the rest of the country and the world. Over the next century, for demographic and economic reasons, these communities expanded and many railways moved their yards and operating facilities away from the highly populated town centres. In the late 20th century, increasing numbers of residential and commercial

developments were built in close proximity to railway properties, both in the downtown cores and in outlying areas. This trend continues today. In some cases, as we witnessed only too vividly, development can result in a residential area on one side of the track and schools or recreational facilities on the other, in spite of the obvious safety concerns relating to crossings and trespassing.

Residents of the new developments complain not only about crossing safety and train speeds through their community, but also about blocked crossings, the noise, pollution and vibrations emanating from the trains and their yards, and the quantity of dangerous goods being carried on trains through densely populated areas. The Panel received many submissions regarding these issues, from residents in urban and rural municipalities alike.

7.1.1 Current Process for New Development

> When will our municipalities stop allowing new homes to be built so close to railway tracks?
>
> Luba Lallouz Submission.

The issue of new development near railways is a multi-jurisdictional challenge, since land-use planning and development is both a provincial and a municipal responsibility, while the major railways and their rights-of-way are federally regulated. There are no consistent consultation protocols or land-use appeal mechanisms across the country, and provincial and municipal land zoning and permit procedures vary widely. Under the *Railway Safety Act* (s.8(1)), a railway company must give notice of a proposed railway work to adjacent landowners and the municipality. Municipalities and developers, however, are not required to provide similar notice to railway companies when they plan new development near railway lines.

> With few exceptions, railways have no power beyond their rail right of way and cannot control adjacent landowners' land use. … [A] federal regulator can cause a railway to address a proximity complaint, but has little or no authority over a … municipal authority whose inadequate planning may have … led to the incompatible land use situation in the first place.[1]

Many of the submissions we received, from railway companies, municipalities, provinces, affected residents, Members of Parliament, sector associations and the general public, expressed concern about the proliferation of new development near railways. Several municipalities wanted better coordination between regional interests and railway companies to minimize risks to people and the environment. The District of North Vancouver, for example, stressed the need for federal guidelines and enforcement powers to mitigate the impacts of rail activities in urban areas, and the participation of municipalities in this process. The City of Côte Saint-Luc cited

[1] CN, "Railway Safety in the Community," *Submission to the Railway Safety Act Review Panel* (June 27, 2007), page 17.

the need for robust consultation and a dispute resolution process that would oblige municipalities and railways to consult in planning matters, saying there is increasing pressure from developers and private landowners to develop along the railway corridor and in close proximity to the railway yards.[2] The Province of Manitoba raised similar issues:

> Taken together, neither the Canada Transportation Act nor the RSA adequately deals with the sustainability dimension of railway operations – that is, what is reasonable from a railway operating and infrastructure planning and development perspective as it impacts on the quality of life of citizens and communities and the environment.[3]

We learned that municipalities and developers often do not notify railway companies when land abutting their rights-of-way is subdivided or slated for development. A 2007 Transportation Development Centre (TDC) report on safety at private crossings also discusses this issue:

> In certain instances, land is sold and housing subdivisions are built without any access except across the tracks at an existing private crossing. Municipalities have issued building permits without ensuring there are legal access provisions for the new residential area. Once houses are built, the crossing becomes used by all residents and is required for emergency services access; therefore, it cannot be closed. … The roadway does not fall under the responsibility of the road authority because there is no agreement governing it; therefore, the railway and the original crossing applicant become responsible for a de facto public crossing.[4]

The Panel is encouraged, however, by some recent developments. Several stakeholders mentioned Ontario's new buffer zone requirements. Regulations under Ontario's *Planning Act* now require that railways be notified of official plans (and amendments), subdivision plans, zoning bylaws and consents to sever lands if the proposal involves any land within 300 metres of a railway line.[5] The railways may review the documents and recommend provisions to address any potential land use compatibility issues. If the railways' proposed adjustments to deal with such issues are not incorporated into the land development project, the railways may raise the matter with the Ontario Municipal Board.

[2] City of Côte Saint-Luc, *Submission of Dida Berku, City Councillor Côte Saint-Luc* (June 2007).

[3] Manitoba Infrastructure and Transportation, *Submission to the Railway Safety Act Advisory Panel* (August 2007), page 4.

[4] Ron Stewart, Russell Brownlee, Matt Colwill and Shelagh MacDonald, IBI Group UMA/AECOM, *Identification and Examination of Safety at Private Crossings*, Prepared for Transportation Development Centre, Transport Canada (February 2007), page 59.

[5] *Official Plans and Plan Amendments*, O. Reg. 543/06, s. 3(9) 7, under the *Planning Act* (R.S.O. 1990, c. P.13).

> Ontario's approach allows for potential incompatible land use issues to be raised and addressed prior to the matter becoming a problem. It also ensures that potential purchasers of such residential properties are properly advised of any such existing situation.[6]

This is a step in the right direction, and the Community-Rail Proximity Initiative developed by the Railway Association of Canada (RAC) and the Federation of Canadian Municipalities (FCM) is another. The RAC represents most of the railways in Canada, while the FCM speaks for 1,653 municipal governments, representing 90 per cent of the Canadian population. In 2003, the RAC and FCM, supported by the Canadian Association of Municipal Administrators (CAMA), signed a three-year memorandum of understanding (MOU) on proximity issues – "to build common approaches to the prevention and resolution of issues when people live and work in close proximity to railway operations."[7] The MOU was renewed for two years in January 2007. This initiative recognizes the need for better communication among various stakeholders, including railways, municipalities and developers.

> Under the MOU, the parties will jointly work … to develop and implement a strategy to reduce misunderstanding and avoid unnecessary conflict arising from railway-community proximity. Areas for action include: developing commonly understood proximity guidelines; improving awareness among all stakeholders regarding the need for effective planning and management; and developing a dispute resolution protocol to guide concerned parties when issues emerge.[8]

The proximity guidelines are intended, among other things, to reduce trespassing potential, minimize the effects of noise and vibration, and provide appropriate buffers and berms. A dispute resolution framework was also created, which included community advisory panels.

As a result of the RAC/FCM initiative, the City of Edmonton recently passed an amendment to its zoning bylaw addressing residential development on lands adjacent to railway rights-of-way and establishing regulations to address safety, security, noise, vibration and trespass for development on lands adjacent to rail facilities in Edmonton.

Recent amendments to the *Canada Transportation Act* complement the MOU framework. Before these amendments, citizens adversely affected by noise and vibrations from railway operations could either make a formal complaint to the company or seek civil action through the courts. No federal body was mandated

[6] CN, "Railway Safety in the Community," op. cit., page 18.

[7] Railway/Municipality Proximity Issues Information Base website, "About Us – Joint Initiative:" http://www.proximityissues.ca/english/AboutJoint.cfm.

[8] Ibid.

to regulate railway noise and vibrations. The new amendments to the Act give the Canadian Transportation Agency (CTA) the authority to resolve noise and vibration complaints caused by the construction or operation of railways under federal jurisdiction. The CTA has also issued draft guidelines setting out the collaborative measures that parties must apply before it can conduct an investigation or hearing.[9] The guidelines focus on required proximity elements and principles, not standards or thresholds, and promote the types of protocols and recommended practices that are contained in the MOU.[10]

We are convinced from our consultations that there is a need to improve and formalize the communication between municipal jurisdictions and the railways on the safety implications of land use and road access near railway properties. Roles and responsibilities should be clarified and recognized. Municipalities and landowners, including the railways, should engage in robust consultation during the design and planning stages for land use and non-railway works near railway lines. Municipalities should ensure that access roads for new subdivisions are built to existing public crossings, and they should take responsibility for the crossings during the development phase. The costs for the ongoing maintenance of the crossings should also be considered in planning. Municipalities might need to require developers to absorb the costs of crossing upgrades to accommodate new land uses.[11]

In summary, there is an increasing need for the integration of rail transportation issues in land-use planning to ensure that adequate consultation takes place between the developer, the municipality or other local government, and the railway on proposed changes in zoning and uses of lands abutting railway lines and yards. Shared solutions arrived at through such consultations lead to the notion of shared financing of these solutions. Opportunities to promote active partnerships with local authorities should be encouraged. Railway infrastructure should be considered in the design, zoning and planning of communities to reduce opportunities for negative interaction between trains and people.

RECOMMENDATION 34

The *Railway Safety Act* should be amended to require the developer and municipalities to engage in a process of consultation with railway companies prior to any decision respecting land use that may affect railway safety.

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[9] Canadian Transportation Agency website: http://www.cta-otc.gc.ca/rail-ferro/bruit-noise/consultation/a_e.html.

[10] Railway Association of Canada, *Proximity Management & Community Outreach in Canada*, Presentation to *Railway Safety Act* Review Panel (July 2007).

[11] IBI Group, *Safety at Private Crossings*, op. cit., page 59.

7.2 CROSSING SAFETY

A crossing is the point at which a public or private road meets a railway line or right-of-way. Public crossings at grade level (grade crossings) may include active warning systems (automated gates, lights and bells) or passive warnings (crossbucks and other signage), depending on criteria such as the volume of road and rail traffic. Grade separations (bridges and underpasses) are used in particularly high-traffic volume areas or locations that pose a special risk. As we mentioned in Chapter 4, the *Railway Safety Act* stipulates rules and regulations for all aspects of railway crossing safety, including crossing construction, access to railway land, and control of automobile and pedestrian traffic on road approaches to railway crossings. While Transport Canada oversees railway compliance, and railway companies have rigorous safety inspection programs for crossings, crossing safety is also a shared responsibility among the railway authorities, the local community and the regulatory and investigation agencies.[12]

Any discussion of land use near railways must include the major challenge of grade crossing safety. Watching small children dodging around large, heavy trains at the grade crossing near Wetaskiwin was a sombre reminder to the Panel of the importance and dangers to the public of rail and highway intersections, especially given today's increasing road traffic, and the number, length and speed of trains. It was a reminder, too, that many crossing and trespassing accidents occur because people underestimate the speed and distance of trains. A train can take more than a minute and up to two kilometres to come to a complete stop.[13]

There are approximately 43,000 federally and provincially regulated public and private railway grade crossings in communities across Canada,[14] so it is not surprising that the issue of their safety looms large for railway companies, the federal government, provinces, municipalities, the general public and others. We heard many thought-provoking opinions from all parts of the country on the closure of existing crossings, the creation of new crossings, and the safety of crossings. Members of the public, municipalities and first responders have concerns about trains blocking crossings for too long; municipalities, provinces and railways have concerns about the funding of crossing safety improvements.

Other countries recognize the importance of addressing crossing safety issues. Australia, for example, is in the process of introducing legislation that will require

[12] Railway/Municipality Proximity Issues Information Base website, op cit.

[13] Railway Association of Canada, "Canada's Railways Lead North America in Safety," *Safety Backgrounder* (July 2007), page 3.

[14] Data provided by Transport Canada, Rail Safety Directorate, November 2007. For the purposes of this chapter, farm crossings have been included under private crossings.

railway companies and road authorities to work together to do a risk assessment of crossings and develop mitigating measures.

In the United States, where there are more than 250,000 public and private grade crossings, crossing and trespasser deaths account for 90 per cent of all rail-related deaths.[15] As part of its Highway-Rail Crossing Safety and Trespass Prevention Program, the Federal Railroad Administration (FRA) dedicates 26 employees to grade crossing and trespassing issues. The FRA is responsible for public grade crossing issues that affect highway safety, and administers the distribution of federal funds (US$220 million per year) to eliminate hazards at both public and private level crossings, through closures, grade separation, advanced signalling technologies, and other means.[16] Funding is given to individual states, which decide on their priorities for grade crossing improvements, including creating or closing crossings. In addition, individual railway companies have active programs to help prevent grade crossing accidents. For example, BNSF Railway Company is working closely with communities and property owners, and has closed over 3,500 public and private crossings since 2000.[17]

In Canada, as in the U.S., crossing and trespassing accidents are by far the largest source of railway fatalities and serious injuries, comprising 87 per cent in 2006.[18] The research study, *The State of Railway Safety in Canada*, notes that while several factors have influenced the statistics on crossing and trespassing accidents (for example, the change in 1992 that made more crossing accidents reportable, CN and CP transfer of lines to provincial railways, Direction 2006 and the increasing growth in road traffic), the importance of crossing and trespassing accidents as the major source of serious injuries and fatalities in rail accidents is without question.[19]

That being said, there has been a downward trend in the number of crossing accidents since the 1980s (see Figure 2.4 in Chapter 2). This has been attributed to a number of factors. Public education initiatives, such as Operation Lifesaver and Direction 2006, have been very effective. They are supported by all levels of government, the rail industry and its unions, national and provincial safety councils and leagues, sector associations, police and first responders, and public and community groups. Industry restructuring has resulted in the elimination of a number of grade crossings through line abandonment and other processes. Crossing protection

[15] U.S. Federal Railroad Administration, Highway-Rail Crossing & Trespassing Safety Initiative http://www.fra.dot.gov/us/Content/808.

[16] *Highway-Rail Crossing Program*, Federal Railroad Administration website: www.fra.dot.gov/us/Content/86.

[17] Association of American Railroads website: http://www.aar.org/Rail_Safety/Gradecrossing.asp.

[18] Joseph Schulman, CPCS Transcom Limited, *The State of Rail Safety in Canada* (August 2007), section 2.3.

[19] Ibid, section 2.3.

systems have been modernized and improved. Railway safety inspectors have been able to focus more attention on the safety of existing crossings since the transfer of some of their duties to the CTA in 1989. The wide dissemination of documentation on the proposed grade crossing regulations between 1995 and 2003 led to much greater awareness of crossing safety. Perhaps most importantly, the federal Grade Crossing Improvement Program has funded many safety improvements.

While there is some cause for satisfaction, we believe that there is much work to be done to improve safety at crossings. As both rail and road traffic continue to grow, the risk of grade crossing accidents will continue to increase.

Crossing safety is a key issue for all railways, whether under federal or provincial jurisdiction. While the great majority of crossings are on federally regulated railways and are governed solely by federal legislation, there are also a number of provincially regulated crossings to which nine different provincial standards apply.[20] Jurisdictional disagreements can arise over such issues as lighting, fencing, drainage culverts and maintenance of roads at crossings. An important factor in crossing and trespassing accidents is that they involve and are usually caused by third parties. The enforcement of crossing safety is also a jurisdictional challenge, with national, provincial, municipal and railway police forces all involved to some degree.

Research is of great importance in improving crossing safety and many useful studies have been carried out over the last few years. In Canada, Transport Canada's Transportation Development Centre (TDC) is the lead agency for the development and implementation of the Highway-Railway Grade Crossing Research Program, which was a major component of the Direction 2006 research area. Transport Canada, larger Canadian railways and several provincial authorities are the primary research sponsors, with other stakeholders providing cash and in-kind contributions. This program is investigating innovative technologies to increase the effectiveness and lower the cost of warning systems. It is also looking at the human factors that contribute to grade crossing collisions. The areas being examined include risk mitigation methodologies; driver, pedestrian and vehicle behaviour; enforcement technologies; active warning crossings; signal lights and structures; passive warning crossings; train-based warning systems; and outreach and technology transfer.[21] We encourage Transport Canada to take a leadership role in the advancement of technologies that would improve crossing safety. We discuss the technological aspects of crossing safety more fully in Chapter 10.

[20] IBI Group, *Safety at Private Crossings*, op. cit., page ix.

[21] *Highway-Railway Grade Crossing Research Program*, from Research Initiatives Update: Presentation to the 19th Annual Operation Lifesaver Conference, September 18, 2007. Also see the Transportation Development Centre website at: www.tc.gc.ca/tdc/projects/rail/b/9754.htm.

7.2.1 Crossing Closures

The most obvious way of minimizing interaction between people and trains and eliminating accidents at railway grade crossings is to close the crossing. In its submission to the Review, the RAC noted that international railway safety experts have stressed the importance of grade crossing elimination or consolidation as a key element in reducing crossing accidents. Closing a crossing is, however, no simple matter.

Transport Canada has the authority to permanently close a crossing if there is an immediate threat to safety. This action is rarely taken because appropriate remedial measures can usually be put in place to improve the safety of a crossing.[22]

Railway companies may close private crossings that have been established "by grace" (where a person purchases separate parcels of land on each side of the rail right-of-way), for example, when a crossing owner does not respect the stipulations of the crossing agreement in place. This appears to be done only in extreme circumstances. In such cases, affected landowners may appeal the railway decision to the Canadian Transportation Agency, which will review the case. Railways can also remove crossings that are no longer in use.[23]

Finally, a private crossing owner may close a crossing voluntarily. In some cases, the railways offer financial assistance for voluntary closures, and under section 12.1 of the *Railway Safety Act*, Transport Canada's Grade Crossing Closure Program offers subsidies for closing a crossing under certain conditions. The funding is limited, however, and does not realistically reflect the costs of establishing alternative access to the crossing. The TDC study on safety at private crossings noted that "existing crossing closure programs seem to offer little incentive for private crossing owners to close their crossings, and almost no flexibility for multiple stakeholders to work together to develop alternative access strategies."[24]

The RAC and the railways recommended that the crossing closure program be given greater priority by Transport Canada, and that crossing reduction targets be developed, as has been done successfully in the United States. The Panel agrees that more emphasis should be put on identifying crossings that could be closed.

7.2.2 New Crossings

The creation of new crossings is another contentious issue. Under section 8.1 of the *Railway Safety Act*, the proponent must give notice of a proposed new crossing

[22] IBI Group, *Safety at Private Crossings*, op.cit., page 61.

[23] Ibid., page 61.

[24] Ibid., page 61.

to the other parties involved. If there are any objections for safety reasons, the proponent must apply to the Minister, who considers the matter and makes a ruling.

From an economic standpoint, if the landowner and the railway disagree on whether they have a right to build a new public, private or utility crossing (one involving wires, cables or pipelines), they can apply to the Canadian Transportation Agency for a ruling. Under the *Canada Transportation Act*, if someone buys property on both sides of a railway line, they can request a crossing. In addition, the railway is obliged to provide a crossing when property is otherwise severed. Over the last 10 years, the CTA has received 23 applications for private crossings under section 102 (by right – where an owner's land has been divided as a result of the construction of the railway line), of which nine were granted, and 14 denied. Under section 103 (by grace), there were 11 applications, of which nine were granted and two denied.[25]

Railways generally oppose the creation of new crossings, for reasons of safety, and believe that the CTA should give higher priority to safety in reviewing crossing applications. The CTA maintains that, while its role is primarily an economic one, decisions about the "suitability" of particular crossings include safety considerations. It informs Transport Canada if there are potential safety concerns and seeks the department's opinion prior to making a decision. In fact, all new crossings authorized by the CTA must comply with the safety requirements of the *Railway Safety Act*.

In its submission, VIA Rail recommended regulations prohibiting the construction of new crossings unless it can be clearly shown that all other options have been fully reviewed and determined not to be feasible.[26] VIA also noted in its presentation to the Panel that rural crossings should be eliminated or combined. This is not surprising. Given the nature of passenger rail operations, which involve relatively light trains moving at high speeds, the great majority of accidents involving passenger trains are crossing and trespassing accidents. Most of the increase in passenger train accidents (from 67 in 2002, to 85 in 2005) was accounted for by crossing accidents.[27]

The FCM points out that communities with limited land for development would be crippled if new crossings were not allowed. Our previous recommendation on new development near railways would require consultation on the construction of new

[25] To have a right to a crossing under section 102 of the *Canada Transportation Act*, there must be a piece of land under private ownership which was divided by the construction of a railway line sometime after 1888 and which has remained in single ownership since that time. In such cases, the railway supplies and pays for a crossing. … The usual reasons for denial include a) the railway was constructed on Crown land and not over private land; b) the construction occurred prior to 1888 when the right to a crossing was first established under the *Railway Act*; c) land on one side of the railway has been sold or severed and the right to cross was not maintained in the transfer; d) the land on both sides of the railway has been purchased at different times (did not remain in single ownership). Information provided by the CTA.

[26] VIA Rail Canada, *Submission to Railway Safety Act Review Panel* (August 2007), page 13.

[27] Schulman, *State of Rail Safety*, op. cit., section 5.

crossings, among other issues. Although we acknowledge that new crossings must sometimes be constructed, we strongly feel that efforts should be made to limit their numbers, and that grade separations, such as bridges and underpasses, should be considered as an alternative.

The cost issues of grade separations are of course considerable, and their extensive construction is probably an unachievable dream in Canada, given that the population is so thinly spread over such a vast geography, and that the tax base is correspondingly diluted. Large cities may be the exception, and indeed, joint public/private funding was announced last year for a new railway underpass in Winnipeg, and in June of this year for several grade separation projects.[28]

7.2.3 Safety at Existing Crossings

Since Canada's size and population cannot support many grade separations or even crossing closures, we will always have to deal with the issue of making the thousands of existing highway-railway crossings scattered across the country safe for all users. This is a primary concern for all levels of government, railway companies, first responders and the general public, especially people who must regularly drive and walk across railway lines in the course of their day-to-day business. While the number of crossing accidents appears to be decreasing, there is no room for complacency. One has only to look at Transportation Safety Board investigation reports on crossing accidents to see that there are many issues still to be solved.[29] With new urban development, the growing number of vehicles and drivers, and the increasing length, frequency and tonnage of trains, the potential for serious grade crossing accidents is growing.

> Before crossing the tracks … I stopped to make sure a train wasn't coming. However, when I was in the middle of the crossing, the red lights started flashing, the arm started down and I was horrified to see a train approaching from the west.
>
> Gwen Glover Submission.

We heard harrowing stories from people across the country about their encounters with railway crossings. We also heard harrowing stories from railways and their employees and police about motorists and pedestrians who ignore the warning devices at crossings and take unnecessary risks. In fact, we learned that more than 50 per cent of crossing accidents occur at crossings equipped with active warning systems. Technology by itself is obviously not sufficient to solve existing crossing safety

[28] Transport Canada, News Releases, "Government Partnership Opens Winnipeg Underpass," (September 22, 2006); seven releases on April 23, 2007; "Government of Canada Announces Improvements to the Roberts Bank Rail Corridor," (June 28, 2007).

[29] Transportation Safety Board website: www.tsb.gc.ca/en/reports/rail. See, for example, Reports R04H0009 (Munster), R04H0014 (Castleford) and R05T0030 (Brockville).

problems, but must be coupled with robust outreach and public education programs, and an understanding of human behaviour. The railway industry refers to the importance of the "four Es" in advancing highway-railway crossing safety: engineering, enforcement, education and evaluation.

A number of improvements to crossing safety have been introduced over the years. These include reflectorization (of crossing signs and rail cars), automated gates, lights and bells, signage, road markings, access control measures, such as security fencing, and grade separations in high traffic-volume areas. Technological innovations include low-cost automatic warning systems, expanded use of LED lights on gate arms, flashing lights instead of signs, illuminated signs, wayside warning systems and in-vehicle crossing warning systems. There have also been suggestions that other low-cost solutions could be developed which, while not optimal, would be a significant improvement over the simple warning signs that exist at many crossings.[30] For example, a U.S. study on the use of the "Yield" sign to supplement crossbucks concluded that it is the most promising passive traffic control device for general use at crossings because it is clearly recognized and understood.[31]

Monitoring and enforcement of crossing violations are important contributors to the safety of existing crossings, and several agencies are involved. Federal railway safety inspectors enforce the provisions of the *Railway Safety Act*; local police forces enforce federal and provincial laws; and CN and CP railway police enforce federal laws on railway property and within 500 metres of that property.[32] In some cases, this arrangement seems to work well with good cooperation on all sides; however, we also heard that, for VIA Rail in particular, the application of rules across regions and host railways is a problem, with railways sometimes enforcing those rules inconsistently.[33]

We learned of a number of effective monitoring and enforcement initiatives that are under way. Several railways, for example, are using the Silent Witness program. As part of a CN pilot program, digital video recorder systems have been installed at a number of particularly dangerous highway-railway crossings in Ontario. In addition,

[30] James Mitchell and Nigel Chippindale, Sussex Circle Inc., *The Governance of Railway Safety in Canada* (September 2007), section 5-B, "Issue 11."

[31] Neil D. Lerner, Robert E. Llaneras, Hugh W. McGee and Donald E. Stephens, *Traffic-Control Devices for Passive Railroad-Highway Grade Crossings*, NCHRP Report 470, Transportation Research Board-U.S. National Research Council (2002), pages 21-23.

[32] Railway police are responsible for the enforcement of Part III of the *Canada Transportation Act* and for the enforcement of federal or provincial laws relating to the protection of railway company property and the protection of persons and property on that property. The police constable has jurisdiction on railway company property and within 500 metres of that property. The statutory authorities for railway police were transferred to the *Railway Safety Act* from the *Canada Transportation Act* in June 2007.

[33] VIA Rail *Submission*, op. cit., page 12.

GO Transit has installed video cameras in all of its locomotive cabs to record safety violations and near misses.[34] Both of these programs are proving to be remarkably successful, as are similar initiatives in the United States.

Three issues connected to safety at existing crossings were repeatedly mentioned during our consultations: blocked crossings, the Grade Crossing Improvement Program and the proposed *Grade Crossing Regulations*.

7.2.4 Blocked Crossings

Blocked highway-railway crossings are an increasing safety concern for many. The time permitted for a train to block a railway crossing at grade is governed by Canadian Rail Operating Rule (CROR) 103(c), which states that no part of a train or engine may stand on any part of a public crossing for longer than five minutes when vehicular or pedestrian traffic requires passage. This rule does not apply to private crossings, which can be blocked for extended periods. When emergency vehicles require passage, however, railways must clear both public and private crossings as quickly as possible. Switching operations must not obstruct traffic at public crossings for longer than five minutes at a time.[35]

A train that is moving very slowly, however, is not considered in violation of CROR 103(c) and can block the crossing for much longer than five minutes. Train lengths and urban development have increased, and in some locations, slow train speeds may result in a busy crossing being blocked for well in excess of five minutes. If a train stops on a crossing for more than five minutes, and a vehicle must cross, a crew member must walk from the locomotive to the crossing location to separate the train cars manually to allow for vehicle and pedestrian passage. At times, this can result in a walk of a mile and a half which, in bad weather, can easily take more than 30 minutes.

Members of the public from all parts of the country complained to us about trains blocking crossings for much longer than five minutes. For example, we heard that in Wabush, Labrador, vehicles have been forced to wait at crossings for 20 minutes, leading to safety concerns about being cut off from the hospital. The Town of Rivers, Manitoba, cited waits of 45 minutes to an hour.[36] Emergency vehicle access is the most important issue for many; however, there are also concerns about school bus access, vehicle idling, delays in agricultural deliveries and the lack of response by the railway companies to complaints.

[34] GO Transit has also installed bells, lights and gates at all its crossings, at its own expense, for maximum crossing protection and improved public safety.

[35] Switching operations can involve a number of different activities, such as moving railway cars from one track to another, building trains, or placing cars for loading.

[36] Town of Rivers, Manitoba, submissions to the *Railway Safety Act* Review (May 2007).

> [O]ur street can be used for hours a day … with locomotives pulling forward and backing up, working outside of the yard, in between our homes, blocking the road and restricting access, often very well beyond the 5 minute legal limit. …. One resident … recalls having her children and a friend in her car, with the tracks blocked for a period of 55 minutes, without anyone attempting to communicate an explanation to her….
>
> Joanne Fisher Submission.

The tendency for motorists and pedestrians to engage in erratic and dangerous behaviour when faced with a potential blocked crossing was also mentioned. Several solutions to the blocking problem and emergency access were suggested, including installing emergency telephones near critical crossings.

It was pointed out by a TCRC representative in Saskatchewan that the five-minute crossing rule is a "farce," and that new 9,500 foot trains, which are almost two miles in length, can block more than one crossing at a time.[37] Conversely, railway companies noted that fewer (but longer) trains actually lead to less blocking of crossings than more numerous (but shorter) trains.

The Panel acknowledges that the blocking of crossings by trains is indeed a valid safety concern. We are satisfied, however, that the RAC/FCM proximity guidelines, as well as the recommendations we have made in the previous chapters, will help railway companies, municipalities and the regulator to address this issue through better consultation and enforcement of existing rules.

7.2.5 Grade Crossing Improvement Program

Transport Canada's Grade Crossing Improvement Program (GCIP) is an important contributor to safety at existing crossings and has invested more than $100 million in crossing safety improvements over the past 15 years.[38] Under section 12 of the *Railway Safety Act*, the GCIP provides contributions of up to 80 per cent of the cost of improvements to railway safety at public crossings in Canada. The balance of the funding is split between the railways (7.5 per cent) and the road authorities (12.5 per cent).

The program has been successful and we feel it should be continued and the funding increased. An examination of crossing collisions since 1990 indicates that virtually all the decline in crossing fatalities has occurred in the group of crossings where

[37] Teamsters Canada Rail Conference, Saskatchewan Legislative Board submission/ presentation, June 6, 2007.

[38] Transport Canada, *Transportation in Canada 2006, Annual Report,* (May 2007), page 25. Because of inflation, this represents a steadily declining amount in real dollar terms.

safety improvements have been funded under the GCIP.[39] The number of collisions at public crossings that were not improved under the GCIP, and at all private crossings, has remained constant or declined only slightly during that period.

The GCIP generated much discussion during our Review, as did the possibility of reintroducing grants for grade separations. Currently, the program applies only to public, federally regulated crossings, and stakeholders feel that many private crossings present similar safety risks. There are approximately 20,000 private crossings in Canada, many of which are used by the general public. As was discussed in the previous section, a crossing that starts out as private in a new subdivision can very quickly become a de facto public crossing. In its draft crossing regulations, Transport Canada has replaced the terms "public" and "private" with "unrestricted" and "restricted," to better reflect the use of the crossing. In the Panel's opinion, the GCIP should apply to private crossings as well as public. Private crossings do present safety issues and should not be excluded from funding, especially if they are used by the general public, an important consideration that would be prominent in the eligibility criteria.

The lack of federal funding to upgrade crossings on provincially regulated railways was raised by several provinces. New Brunswick pointed out that VIA Rail runs most of its distance through the province on provincially regulated track, which is not eligible under current rules for federal crossing upgrade grants.

The Panel found that there is disagreement over the funding formula for the GCIP and who should pay for the maintenance costs of railway infrastructure at crossings - the railways or the road authorities. Submissions from Ontario stated that the process for GCIP funding is divisive. Northumberland County noted, for example, that:

> The RSA and processes associated with the allocation of funding for improvement to railway/road crossings and grade separations is currently an adversarial process that sets local municipalities against railway companies for limited available funding through fewer and fewer sources.
>
> By virtue of this process, the limited available money is used up on legal fees and appeal costs to the Canadian Transportation Agency (CTA); money that would be more appropriately utilized on actual physical improvements to grade crossing improvements, signals and other safety devices intended to protect the public.[40]

[39] According to statistics provided to the Panel by Transport Canada's Rail Safety Directorate, the five-year average collision rate for crossings *funded* under the GCIP between 1989 and 2004 was reduced by 70 per cent. The fatality rate was reduced by 83 per cent. For public crossings *not funded* under the GCIP, the collision rate decreased only moderately, by 4.8 per cent, while the fatality rate *increased* significantly, by 22.7 per cent.

[40] Northumberland County, Ontario, submission to the *Railway Safety Act* Review (July 2007).

Saskatchewan has 25 per cent of all grade crossings in Canada. We were told by Saskatchewan provincial officials that the backlog of planned grade crossing projects due to funding constraints is compromising safety.[41] Often, local governments make funding applications to Transport Canada and have to wait for up to five years for the grant, living with the safety risks in the interim and then discovering that the original construction estimates on which the application was based no longer apply. Although we were told that the department goes through an annual priority-setting exercise each year where each region recommends its most critical crossings for GCIP funds, most provinces have important projects waiting to be funded. For example, three of New Brunswick's five railway crossings on the National Highway System have an average traffic count of more than 20,000 vehicles per day. Funding to assist with the grade separation of these crossings is a high priority for the province.[42]

The recent federal/provincial joint-funding agreement for short line railway infrastructure in Quebec was mentioned by several provinces. Provinces also noted that more research programs are needed to develop incremental safety improvements that can be implemented at grade crossings by local road authorities to maximize the limited resources available.

The *Railway Safety Act*, under section 14, provides the vehicle through which government funding could occur. We support additional funding for federally regulated public and private crossings and recommend that this provision be utilized. Provinces recognize, however, that there is a need for a regional ranking system for crossing improvements to assist in identifying priorities for funding. The Panel is not in favour of making provincial railway crossings eligible for federal funding. The interface between provincial and municipal roads and provincially regulated track is clearly a provincial responsibility.

7.2.6 Proposed *Grade Crossing Regulations*

Many provinces and municipalities commented on Transport Canada's proposed *Grade Crossing Regulations* in their submissions. These regulations and the supporting Technical Standards and Inspection, Testing and Maintenance Requirements (RTD 10), would replace current regulations for the construction, inspection, testing and maintenance of grade crossings and their approaches, and the control of the use of land adjoining crossings as it affects safe railway operations. They would establish safety standards for the construction, inspection, testing and maintenance of all at-grade crossings and road approaches, as well as a requirement for periodic safety assessments (at least once every five years) and other specified assessments.

[41] Saskatchewan Highways and Transportation, *Government of Saskatchewan Submission to the Railway Safety Act Review Panel* (May 2007), page 6.

[42] New Brunswick Department of Transportation, *Submission to the Railway Safety Act Review Panel* (July 2007), page 12.

While Transport Canada began to develop the regulations in 1988, they have not yet been adopted, although we were told that, in practice, provincial road authorities are performing their crossing work functions to meet the new proposed standards, especially for new crossings. Many municipalities are constrained, however, by the resources they can devote to safety assessments, crossing maintenance and upgrading of existing crossings.[43]

Provinces and municipalities appear to have two outstanding concerns about the regulations: cost and process. Under the proposed regulations, railway companies and road owners will be required to conduct safety assessments of all public road crossings within five years. These assessments will result in the systematic identification of all grade crossings with deficiencies, as opposed to the ad hoc identification of such crossings by Transport Canada inspectors.

> Implementing RTD 10 will lead to the identification of a substantial number of crossing improvement projects. Addressing these projects will be delayed due to a lack of funding. Nova Scotia would expect the establishment of a national funding program accessible to all railways where there is a significant change in the regulatory requirements.
>
> Government of Nova Scotia, Submission, page 5.

Manitoba summed up the positions of many of the provinces when it expressed concern that the new RTD 10 requirements will impose even greater cost and other resource burdens than already exist. Like Nova Scotia, Manitoba recommends that Transport Canada improve the GCIP to allow parties involved in crossing safety the means to reasonably deal with the cost of compliance with the proposed regulations.[44] Ontario also commented about the effect of RTD 10 on its short lines, noting concerns that "[the proposed *Grade Crossing Regulations*] will impose a costly burden on short line railways without any concomitant increase in railway safety."[45]

We are struck by the fact that neither the *Grade Crossing Regulations* nor the *Access Control Regulations* (discussed later in this chapter) have yet been adopted. Given their potential impact on provinces and municipalities, these regulations are an example of the kind of strategic issue that should be made a priority for the revived Federal-Provincial Working Group on Railway Safety mentioned in Chapter 3.

As a result of our consultations and our research, and considering the issues discussed above, we are convinced that increased funding is required for grade crossing improvements. It is clearly important to improve crossing safety in Canada

[43] Manitoba, *Submission*, op. cit., page 7.

[44] Ibid., page 7; Nova Scotia Transportation and Public Works, *Government of Nova Scotia Submission to the Railway Safety Act Review Panel* (June 2007), page 5-6

[45] Ministry of Transportation Ontario, *Submission to Railway Safety Act Review Panel* (August 2007).

by strengthening and consolidating existing programs, and we see a need once again for consultation and cooperation among the disparate parties involved. Cost sharing among railways, road authorities and others would help to reduce the backlog of planned grade crossing improvements.

RECOMMENDATION 35

Transport Canada, with the railways and other relevant stakeholders, should develop a program to:

- **identify where crossings can be closed;**
- **limit the number of new crossings; and**
- **improve safety at existing crossings.**

A five-year action plan should be developed and should include a provision for shared funding, including shared funding for improvement of private crossings. The Panel recommends increased funding for grade crossing improvements.

7.3 COMMUNITY OUTREACH BY RAILWAYS

The sight of the railway employee reprimanding the small boy who was trying to crawl under the train in Wetaskiwin reminded us how essential it is for railways and communities to communicate.

The relationships between railways and communities have been significantly changed in recent years by intermodal traffic, 24/7 railway operations to meet just-in-time delivery and ever-increasing transportation demands and, perhaps most importantly, the fact that trains generally no longer stop in small towns to make deliveries or pick up passengers. The railway companies are carrying more freight, transporting more dangerous goods through built-up areas, and passing through towns and villages at higher speeds. Traditional relationships between communities and railways are disappearing and it is thus doubly important that new avenues of communication be developed to garner public trust. Effective community outreach by railways is essential to the safety of the public.

> The lives of our residents are completely impacted by the presence of the railways in our community. Our people work for the railways, stop for the railways, receive tax revenue from the railways, and have grown accustomed to the noise associated with what is one long industrial zone. Generally, the relationship is a happy and symbiotic one, however from time to time there are events which threaten the very life of the community….
>
> Lytton First Nation and Village of Lytton Submission, page 1.

Railway companies themselves, along with municipalities, provinces, affected residents, the general public, members of Parliament, emergency responders, sector associations and land surveyors, raised this issue. The research study on *Rail Transport and the Environment* notes:

> The attitude of railways to communities is not always positive and communities can in some instances be equally suspicious and resentful of the railways. The result is an adversarial relationship and/or a lack of trust between local authorities and the railways… The way forward … is more complicated; attitudes often appear entrenched and may in some cases be long-standing. …. [These issues] should nonetheless be identified and recognized for the impediment they might represent to an effective local response and the willingness of rail companies to notify and respect local authorities.[46]

We received numerous impassioned submissions from the public about train speed, length, noise, vibrations, shunting in yards, whistling, fumes, pollution, crossings, fencing, livestock and property damage. These suggested to us that the lines of communication between railways and communities are not always open and that railway outreach to communities could be improved. Today's public demands transparency and expects to be well informed.

There are concerns about the nature and quantity of goods, dangerous or otherwise, that are being carried through communities, especially areas of dense population.[47] Communities, including Montmagny, Quebec (which has had two major derailments in the past three years), Brandon, Manitoba, and Chilliwack, B.C., are concerned about high train speeds through residential and commercial areas.[48] The maintenance and replacement of fencing is a major issue for B.C. cattlemen and ranchers, who lament the lack of fencing requirements and policy in the RSA.[49] Land surveyors are finding it more difficult to gain access to railway lands to do their jobs.[50] Other communities (for example, Calgary, Alberta, and Salisbury, New Brunswick) are concerned about the potential pollution of their ground water by railway activities. The railways' use of herbicides to control weeds on their rights-of-way is troubling for many.

[46] Liane E. Benoit, Benoit & Associates, *Rail Transport and the Environment in Canada* (August 2007), pages 32-33.

[47] See for example, submissions from Defenders of Wildlife Canada (April 9, 2007), and Eka Chemicals Canada Inc. (June 15, 2007).

[48] Ville de Montmagny, *Demande de réduction de la vitesse du train dans la Ville de Montmagny*, submission to *Railway Safety Act* Review (June 2007); submission of Brian Kayes, Director of Emergency Coordination, Brandon, Manitoba (June 28, 2007); submission of City of Chilliwack (April 18, 2007).

[49] Noted in British Columbia Ministry of Transportation, *Submission to the Railway Safety Act Review Advisory Panel* (September 2007), page 6.

[50] Canadian Council of Land Surveyors, submission to the *Railway Safety Act* Review (August 7, 2007).

The uneasy relationships that result from increasing urban development near railway yards and lines are evident in the number of complaints from the public about vibration and noise from railway yards, often resulting from the shunting and switching of cars and idling locomotives. While in the past, recourse for such complaints was difficult, we are satisfied that the recent amendments to the *Canada Transportation Act* mentioned earlier will help many communities and members of the public to address such concerns.

Another common noise-related complaint, and one that is directly linked to safety, is the issue of trains whistling as they approach a crossing. Currently, train-whistling requirements are set out in the Canadian Rail Operating Rules, and state that trains must whistle as they approach, and until they occupy, public and pedestrian crossings at grade, as a warning to vehicles and pedestrians. Under the *Railway Safety Act*, however, municipalities may pass a resolution prohibiting train whistling in certain areas within their boundaries, provided that the crossings in question meet regulatory safety requirements. Before passing such a resolution, the municipality must consult the railway and obtain its concurrence, notify each relevant association or organization and give public notice of its intentions. Even so, a locomotive whistle will still be used in an emergency if required under railway operating rules, or if ordered by a Transport Canada safety inspector.

Although we realize that the above solution is not always satisfactory, much research is being done in the area of train whistling, and the Panel is satisfied that the issue is being adequately addressed.[51]

The railway companies themselves recognize the problem of communication with the communities they pass through, and have been doing much work in this area. As we have mentioned, railways actively promote reducing the number of level crossings to mitigate risk and are pressing to be included in the design, zoning and planning processes of communities. They also support other initiatives including safe crossing programs, educational websites and collision simulations. CN has developed a railway response template for first responders. The major railways, along with provincial coroners and the Canadian Association of Chiefs of Police, helped to develop the *Canadian Rail Incident Investigation Guidelines*, a work tool that assists police across Canada. The guidelines have helped to expedite the investigative process and get trains moving by putting an end to jurisdictional disputes between railway and local police in cases of deaths on railway lines.[52]

[51] For example, a wayside horn pilot project is being tested in the Saguenay region of Quebec to determine if the technology can effectively reduce noise levels and provide the same, or a higher, level of safety as the locomotive horn. The wayside horn sound is directed towards oncoming road traffic as the train passes, rather than the train sounding its horn as it rolls through the community. Information provided by Ministère des Transports Québec; Railway Association of Canada, *Safety Backgrounder*, op. cit., page 3.

[52] Presentation by Dr. Jim Cairns, Deputy Chief Coroner, Ontario, Operation Lifesaver Conference, September 18, 2007.

Both CN and CP have suicide prevention programs, safety blitzes, 1-800 emergency signs at crossings, and police forces that work jointly with police services across Canada and are active in schools and the community. VIA works regularly with the railway industry and communities to raise awareness of the need for caution around railway tracks and at level crossings. For example, VIA has collaborated with CN in the Officer on Board program, in which a train equipped with track cameras carries law enforcement officers, giving them a first-hand view of the kinds of situations locomotive engineers deal with and creating a better understanding of rail safety issues. VIA also sponsors twice-yearly town hall meetings across the country to address community concerns.

The CP Police Service has been instrumental in a "living fence" initiative that creates a natural barrier (e.g., thorny rose bushes) to deter trespassing, an alternative to traditional fencing that is easily and often cut through and vandalized. In addition, CP Police sponsor community awareness and clean-up programs, as well as a program promoting railway safety in First Nations communities, and its own Officer-On-The-Train program.

Railway companies are strongly involved in Operation Lifesaver and other community outreach and charity fund-raising initiatives. Their employees routinely make presentations to community groups about railway safety. Railway companies are also involved in community investment and corporate sponsorship programs.

The participation of the railway companies in the Canadian Chemical Producers' Responsible Care® safety program, and its Transportation Community Awareness and Emergency Response (TransCAER) community outreach program is to be commended.[53] Both programs serve as excellent examples of initiatives that increase community awareness of railway activities.

We were generally impressed by the existing community outreach programs run by the major railway companies. Nonetheless, we heard from many stakeholders that the railways are not doing enough to inform communities about their activities. Railways are in a unique situation, unlike aviation, marine and road transportation.

> Class 1 railway rights-of-way and yards have historically been, and continue to be, federally regulated lands falling under federal jurisdiction. However, …these railway lands and yards are thinly and sporadically embedded within provincial and municipal territory and represent a ribbon of jurisdictional control literally, in the case of rail beds [railway rights-of-way], a hundred feet wide and several thousand miles long, making ongoing monitoring difficult if not impossible. … Railways have historically taken the position [with respect to environmental issues] that despite the geographic proximity of rail and

[53] Canadian Chemical Producers' Association website, Responsible Care® program: http://www.ccpa.ca/ResponsibleCare/Success.asp.

provincial and municipal lands, they are not obligated to respect provincial or municipal legislation or by-laws with respect to rail operations taking place exclusively on railway property.[54]

In some parts of the country, the Panel heard that the major railways do not always respect or comply with local rules and requirements, or work with local authorities on emergency response planning, an issue that is discussed again in Chapter 8. Better cooperation and consultation by all parties concerned was called for.[55]

As we noted earlier, railway police sometimes take actions that affect provincial and municipal roads. We heard from Alberta and B.C. that railway police have sometimes denied access to local emergency personnel at accident sites.[56]

> It is [Jasper] Council's view that the importance of an active CN commitment to local emergency planning initiatives can not be over emphasised. .... To date, however, railway officials have demonstrated little interest in working with the Municipality or in addressing the very real safety and liability concerns caused by increased activity of all kinds – not just vehicles and pedestrians, but rail traffic as well – at the level crossing.
>
> Municipality of Jasper Submission, page 2.

One city councillor recommended that "railways should be required to participate in the emergency preparedness committees of the cities in which they operate and should be obliged to provide these cities with regular (monthly) reports of dangerous products which they carry and accidents and or derailments within their territorial limits."[57]

In other places, for example, the District of North Vancouver, railways and communities are working together to resolve problems and the relationship appears to be a good one. The City of Salaberry-de-Valleyfield and the Agglomération de Longueuil, both in Quebec, stressed the importance of bringing railway companies, customers and the community together to discuss shared solutions to mutual problems of a public safety nature.[58]

[54] Benoit, op cit., section 3.

[55] City of Kamloops, submission to the *Railway Safety Act* Review (May 14, 2007).

[56] "The practice of the railways to routinely fail to engage the local or provincial responders in the response, at times by way of a very adversarial approach, is alarming." Province of Alberta, *Submission to the Railway Safety Act Review Panel* (July 2007), page 7. Also see submission from the Union of B.C. Municipalities (July 20, 2007) and District of Chetwynd submissions (May 2 and 18, 2007).

[57] City of Côte Saint-Luc, *Submission of Dida Berku*, op. cit., page 2.

[58] Submissions to the *Railway Safety Act* Review from Ville de Salaberry-de-Valleyfield (June 15, 2007), and l'Agglomération de Longueuil (August 7, 2007).

> The railways should review how they communicate with key stakeholders adjacent to their lines and properties. As noted previously, participation in federal, provincial and regional meetings and conferences of fire, police and municipal officials would help to raise awareness among senior levels of municipal governments and to build the communications lines and trust that are essential during times of crisis.
>
> Canadian Association of Fire Chiefs Submission, page 4.

While railways have established many local outreach initiatives in the numerous communities they pass through across the country, [59] there is clearly a need for more direct and regular communication with ordinary citizens, not just elected officials. This could be achieved through face-to-face town hall meetings or online consultations using Internet technology. Best practices and solutions should be shared. Liaison should be improved, lines of communication should be opened, and active partnerships should be developed with local authorities.

Mock scenarios are regularly staged by government and industry, and the September 20, 2007, "Operation Mile Marker 265" disaster scenario exercise near Cobourg, Ontario is an encouraging example of government and industry groups working together in a unified command system.[60] The railway industry should be encouraged to better promote and publicize such initiatives. Media coverage and cooperation are key. The Great Canadian Railtour Company pointed out in its submission that it is important for the government to counter the effects of negative media coverage of the railway industry and restore confidence that Canada has a safe rail transportation system.[61] We would argue that railway companies have an equally important responsibility to actively promote rail safety in the media.

Finally, the Panel also sees a need for improved compliance by the railways with existing regulations and rules (on blocked crossings, for example). This would certainly go a long way towards gaining public trust and improving relationships with communities.

RECOMMENDATION 36

The railway companies should expand their outreach programs to encourage better communication with the entire community.

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[59] CP, for example, passes through some 600 communities in Canada, see Canadian Pacific Railway Company, "Safety Demands Community Involvement and Participation," *Second Submission* (May 2007).

[60] Railway Association of Canada, "Operation Mile Marker 265," *News Release* (September 20, 2007).

[61] Great Canadian Railtour Company, *Submission to the Railway Safety Act Review Panel* (August 2007).

7.4 TRESPASSING AND PUBLIC EDUCATION

The children we saw at the crossing in Alberta reminded us that the public's attitude towards railway lines and property has traditionally been somewhat casual. Everyone has a story about walking down the tracks, but trespassing on railway property is against the law and is a serious safety problem in North America. There is regular coverage in Canadian media of people being injured or killed while trespassing on railway property. Public education is of great importance in addressing this most serious proximity issue.

7.4.1 Trespassing

Unauthorized access to railway rights-of-way, or trespassing, is a leading cause of loss of life and disabling injury. As we have mentioned, crossing and trespassing accidents remain the cause of almost all railway fatalities and serious injuries. Trespassing accidents increased by 11 per cent in 2006 over 2005, and were 15 per cent higher than the average for 2001-2005.[62]

Fatalities from 1996 to 2006 constitute a much higher proportion of the serious injuries and fatalities in the case of trespassing accidents (70 per cent) than in the case of crossing accidents (43 per cent).[63] Between 1996 and 2006, there were 392 crossing fatalities and 655 trespassing fatalities in Canada.[64]

What are the reasons for this difference? One is that trespassing is not confined to grade crossings, but occurs in cities, towns, municipalities and "hot spots" across the country. As we have seen, new urban development near railways means that more people are tempted to trespass on railway property. Many people take short cuts across or along a railway line, whether on foot or on a snowmobile or all-terrain vehicle. The difficulty of changing human behaviour is a major element in addressing trespassing issues. Fences, signs, policing and regulations, no matter how restrictive, are not completely effective when human behaviour is concerned. Multiple factors are often involved.

Trespassers – human beings – exposed on a railway track are far more vulnerable than human beings inside cars or trucks at crossings. There are regular reports in the media of trespassers who are killed while walking along railway lines, often listening to music on headphones, oblivious to the sound of the approaching train.[65]

[62] Schulman, *State of Rail Safety*, op. cit., section 2.3.

[63] Ibid, section 3.2.1.

[64] Ibid, section 3.9.

[65] For example, an October 2, 2007 article from the *Hamilton Spectator* reported on the death of an 18-year old Grimsby student walking along the tracks wearing his MP3 player earphones; in July, according to a Canadian Press report, a 24-year old was killed by a freight train in Toronto while sitting on the tracks listening to music.

Trespassers sit on railway tracks; they crawl under, climb onto or between railway cars, as we saw.

The third reason for the high number of trespassing fatalities is that a large proportion of them are suicides. Although statistics on suicide are difficult to obtain and substantiate, it is generally accepted that about 50 per cent of trespassing fatalities are suicides.[66] This is an issue of great concern to all the major railways, particularly those involved in passenger transit. A train cannot stop nearly as quickly as a motor vehicle when faced with a trespasser on the track. Fencing and other physical barriers are usually not enough to prevent someone from committing suicide, but studies are revealing that public education programs can be effective. Transport Canada's Transportation Development Centre and the Federal Railroad Administration in the U.S., along with representatives from major railways, are part of a steering committee that is studying the issue of trespasser suicides on railways, including the trauma to train crews of such incidents. The study will undertake a causal analysis of rail-related suicide, assess available countermeasures and provide recommendations for the prevention of suicide along railway rights-of-way.

As mentioned earlier in this chapter, Transport Canada has been working on new *Access Control Regulations*, which will help to control trespassing by restricting unauthorized access to railway rights-of-way and establishing the responsibilities of railway companies and adjacent landowners. Since 1995, there have been no formal requirements for the protection of railway rights-of-way, and this has resulted in provision of access control along some sections of right-of-way but not along others with similar adjacent land-use and population characteristics.[67] The regulations have been drafted and are awaiting implementation. Again, as in the case of the *Grade Crossing Regulations*, this will require cooperation and consultation among the multitude of parties concerned.

Trespassing and vandalism are ever-present concerns for railways, and the "four E" approach (education, enforcement, engineering and evaluation) is often used to address them. Evaluation of the trespassing site by municipalities and railways is important so that properly engineered access control methods can be developed, including fencing, signage and video alarm systems. Railways and communities are making attempts to plan trespass-free design in existing and new urban development near railway property.

Enforcement by railway and local police is also key, and deterrents such as fines are important in underscoring the safety risks of trespassing and crossing violations. Local police are responsible for investigating crossing and trespassing accidents,

[66] Information provided by Transport Canada – Rail Safety Directorate.

[67] See Transport Canada, *Draft - Access Control Regulations* (Version 16, dated November 15th, 2002); Transport Canada, *Railway Right of Way Access Control Policy* (July 2006).

but railway police officers, with their expertise in railway matters, often assist them. We heard, however, that there tends to be a lack of enforcement of trespassing and dangerous behaviour at crossings. VIA Rail, for example, noted that the enforcement powers of railway police regarding trespassing and vandalism should be extended to all law enforcement agencies.[68] The Huron Central Railway, in its submission, underlined the need of short line railway companies for better support from municipalities and police forces to help control trespassing issues.[69]

Finally, rigorous public education programs have been proven to be very effective in preventing trespassing and vandalism, especially in combination with other methods.

7.4.2 Public Education

The Panel learned that the cycle of education, outreach and enforcement of railway safety in each community is an ongoing process that must be continually strengthened. Public education is very effective in reducing trespassing and accidents at crossings, and a wide cross-section of stakeholders have made many efforts in this area. The town of Airdrie, Alberta, for example, has built a pedestrian pathway to deter rail trespassers, and regularly raises the issue of railway safety in council meetings to increase community awareness.[70] In 2004, Safe Kids Canada, the national injury prevention program of the Hospital for Sick Children in Toronto, published an educational resource entitled *On the Right Track for Rail Safety*, with the assistance of Operation Lifesaver, Direction 2006 and CN.[71]

The RAC/FCM proximity initiative provides model guidelines and policies for dealing with trespassing, and many of the railways' community outreach educational initiatives have already been discussed in this chapter. An excellent example is GO Transit's program of using video cameras in every locomotive and cab car. These not only provide invaluable evidence of crossing and trespassing violations and near misses, but are also used as outreach tools. GO Transit regularly contacts commercial enterprises involved in near misses to provide training and information on railway operations.

Another major initiative that has significantly improved public awareness of rail safety is Operation Lifesaver, a North American public education program, which began operating in Canada in 1981 and is sponsored by the Railway Association of Canada and Transport Canada. It works in cooperation with the Canada Safety Council, provincial safety councils and leagues, railway companies, unions, police

[68] VIA Rail, *Submission*, op. cit., pages 12-13.

[69] Submission of Huron Central Railway (August 2007).

[70] "Mayor sends message about railway safety," *Airdrie Echo* (July 11, 2007).

[71] Safe Kids Canada, *On the Right Track for Rail Safety* (August 2004).

forces, emergency responders and public and community groups to reduce the needless loss of life, injuries and damage caused by highway/railway crossing collisions and train/pedestrian incidents.[72]

A national focal point for information on rail safety, the program focuses on the four "Es" and creates safety awareness through the promotion of safe driving skills, and attention and adherence to railway signs and warnings. It cooperates with businesses, governments, railways and civic leaders across the country, and produces printed material and audio-visual presentations in support of its message. There is a network of volunteer presenters, including railway company employees, who visit schools, malls and community groups to raise public awareness of the dangers surrounding grade crossings and trespassing on railway property. They have found that despite all of the warning devices and trespassing enforcement strategies that exist, there is still a lack of knowledge about the hazards that railways present.[73]

Operation Lifesaver has been a most successful program, and was unanimously praised by stakeholders we talked to across the country. The 1994 Railway Safety Act Review Committee also praised the initiative and recommended that it be given higher priority.[74]

Direction 2006 was a related program, which originated in a recommendation made by the same committee in 1994.[75] This 10-year national initiative was intended to halve the grade crossing and railway trespassing accident rate from 1996 to 2006. Partners included Transport Canada, provincial and municipal governments, law enforcement agencies, safety organizations, and railway companies and their unions. The program focussed on research, education, enforcement, legislation, resources, outreach, performance measurement, and communications. Direction 2006 developed the *Community Trespassing Prevention Guide*, and was instrumental in establishing the TDC Highway-Railway Grade Crossing Research Program, as well as initiatives to include rail safety awareness in provincial driver education programs. Although the program did not meet its target of a 50 per cent reduction in accidents, it did reduce them by 26 per cent and is considered to have been successful in raising rail safety awareness.

With the demise of Direction 2006, the Panel was pleased to learn that Transport Canada is establishing a new and permanent outreach program to eliminate crossing collisions and trespassing incidents. The department will integrate its Operation

[72] Operation Lifesaver website: www.operationlifesaver.ca

[73] Ibid.

[74] Railway Safety Act Review Committee, *On Track: The Future of Railway Safety in Canada*, Report of the Railway Safety Act Review Committee (December 1994), page 89.

[75] Ibid, page 104.

Lifesaver involvement and continued partnerships with stakeholders, including provincial governments, regional offices and provincial safety leagues into the program. Interim funding from the department has been approved and industry partners will contribute in-kind resources. This will certainly help to strengthen and consolidate public awareness of railway safety.

There is a need to take pride in accomplishments in the public education area. Many excellent programs are being carried out and more are being planned. Federal funding for these critically important public safety initiatives is essential and should continue and be enhanced. In addition, we feel that provincial governments, which sponsor massive advertising campaigns for road safety awareness programs, should take more of an educative role in promoting rail safety. The two are, after all, closely related. With the changing nature of rail operations and urban development in this country, possibly leading to many more incidents of the type we witnessed, and worse, the importance of the funding of public safety education cannot be underestimated.

RECOMMENDATION 37

Public education programs, such as Operation Lifesaver and Direction 2006, to reduce trespassing and accidents at crossings, have been successful and should be renewed where necessary, and enhanced.

CHAPTER 8
ENVIRONMENTAL PROTECTION AND RESPONSE

Protection of the environment was introduced as an objective of the *Railway Safety Act* at the time of the 1999 amendments. Section 3 of the Act now refers to "… protection of property and the environment, in the operation of railways" as an underlying principle. Despite the addition of this environmental objective, railway accidents that have a serious effect on the environment continue to occur. Such accidents attract a great deal of attention when lives and property are put at risk, and when natural habitat is destroyed. It is clear that the public expects the government to act to protect the environment. It was also clear from our consultations that much of the public concern expressed about railway accidents relates to the damage caused to the environment by products spilled as a result of derailments.

The Panel is very concerned about railway accidents and their impact on the environment, especially those involving commodities that can be severely harmful to populations that straddle railway lines across the country. It is important for Transport Canada to fulfill the environmental objective set out in the Act and to hold the railway industry accountable for its environmental performance. In this respect, it is evident that the authority granted to the department has not been fully applied. In our opinion, Transport Canada falls short of embracing its full environmental oversight responsibilities with respect to railway safety.

At the same time, the railway industry needs to build on its efforts beyond preparing for, and responding to, railway accident spills, and adopt a broader environmental and sustainable transportation approach. While we are confident that implementing the recommendations contained in this report will lead to a safer railway transportation system, there remains an obligation on the part of industry and the regulator to ensure railways are performing in an environmentally responsible manner in all aspects of their operations.

8.1 ENVIRONMENTAL LEGISLATION

The framework of environment-related legislation governing the railway industry is shared among federal authorities, mainly Environment Canada and Transport Canada, and with provincial ministries of the environment. Within this framework, numerous pieces of environmental legislation focus on protecting air, water, soil, wildlife, and, of course, the public interest. Generally speaking, Environment Canada has jurisdiction over spills on railway rights-of-way that are federally regulated and the provinces have jurisdiction over materials that end up on provincial lands.

Transport Canada maintains the RSA for safe railway operations and legislation covering the transportation of dangerous goods.

8.1.1 Transport Canada

The movement of certain materials, ranging from chemicals to manufactured goods, can pose a threat if such goods are not handled properly and safely. The transportation of such products, whether by rail, air, water or road, is regulated under the *Transportation of Dangerous Goods Act* (TDG Act) and its regulations. In addition to the federal statute, each province and territory has enacted legislation to regulate the transportation of dangerous goods. While the jurisdictional coverage varies, the intent is consistent and each piece of legislation adopts the TDG regulations made under the federal statute. While one might expect problems with overlapping roles and responsibilities, in fact, "at a federal-provincial level, there seems to be little ambiguity or dissent over respective roles and the two branches of government appear to have achieved an appropriate and constructive working relationship."[1]

The classification of dangerous goods is dealt with in the *TDG Regulations*. The products fall into one of nine classes and each class is further broken down into divisions. There may be references to the flashpoint[2] of flammable liquids, the sensitivity of explosives or the danger associated with compressed gases. The regulations include requirements for carrying documentation and also prescribe labels and placards for each classification of dangerous good. Such measures are intended to inform handlers and accident responders so that they may take the necessary precautions. The regulations also discuss requirements for emergency response assistance plans (ERAPs), training, means of containment, and rail-specific requirements.

As one would expect, not all commodities fall under the TDG Act. When it comes to their handling and transportation, there are many unregulated goods (those not covered under the TDG Act). Unregulated goods not requiring commodity-specific response plans or special preparedness measures can include such things as sulphur pellets, coal, potash, canola oil, lubricating oils, latex paints, and higher flashpoint solvents and hydrocarbons such as Varsol, and unheated Bunker C fuel. As we discuss later in this chapter, these unregulated goods can pose a significant environmental and human health threat if spilled in sufficient quantity and/or in an ecologically sensitive area. For the purposes of this report, we will refer to these unregulated goods as environmentally hazardous goods.[3]

[1] Liane E. Benoit, Benoit & Associates, *Rail Transport and the Environment in Canada* (August 2007), section 3.

[2] Flashpoint means the lowest temperature at which the application of an ignition source causes the vapours of a liquid to ignite near the surface of the liquid or within a test vessel.

[3] While not federally regulated as to their safe handling and transportation under the TDG Act, there may nevertheless be other regulatory requirements that apply.

The *Railway Safety Act* has as its general purpose the safe operation of railways, and is intended to protect people, property and the environment. In support of its environmental objective, the Act contains a number of provisions specifically dealing with this topic. Section 47.1(2) authorizes the Governor in Council to make regulations restricting or otherwise governing the release of pollutants into the environment from the operation of railway equipment. Despite having this regulatory authority, no attendant regulations have been developed and implemented.

The RSA also makes provision for regulations relating to the removal of trees, brush and weeds, and the use of alternatives to chemical pesticides, under section 24. Stemming from this provision, the *Rules Respecting Track Safety* contain a few references to controlling (i.e., removing) vegetation to improve visibility and reduce the risk of brush fires. In the *Rules for the Control and Prevention of Fires on Railway Rights-of-Way*, procedures are outlined addressing responsibilities with respect to the prevention of fires, as well as the control of fires that may be started along railway rights-of-way. In terms of noise pollution, section 23.1 of the Act deals with the use of whistles in municipalities – a topic that was discussed in Chapter 7.

Transport Canada's stated mission is to serve the public interest through the promotion of a safe and secure, efficient, and environmentally responsible transportation system in Canada. On the basis of our work, we find that protection of the environment, as set out in the RSA in 1999, requires more attention than it has received from Transport Canada.

8.1.2 Environment Canada

Environment Canada is responsible for the federal government's portfolio of environmental legislation dealing with such things as national standards, control of toxic substances, interprovincial matters and international treaties. The *Canadian Environmental Protection Act* (CEPA), the *Canada Water Act* and the *Species at Risk Act* are but a few of the pieces of legislation that contribute to the mandate of preserving and enhancing the quality of the natural environment, conserving and protecting Canada's water resources, and environmental change.

Environment Canada has a lead role for land-based pollution on federal lands under CEPA, but puts the onus on those responsible for the pollution to act. The Act states that if a person releases a regulated toxic substance into the environment, or owns the substance, this person must take all reasonable emergency measures to remedy any dangerous condition or reduce or mitigate any danger resulting from the release. While one would expect that environmental oversight of railway property, as federal lands, comes under the jurisdiction of Environment Canada, in reality, there is a degree of ambiguity since the day-to-day operations of railways fall under Transport Canada and the RSA. For large spills, Environment Canada will be on site. Even small spills of dangerous or environmentally hazardous goods in rail yards, however,

can build up over time and contaminate the soil. It appears little is being done by either Environment Canada or Transport Canada to monitor or control this situation.

An example of the shared environmental mandate between Environment Canada and Transport Canada is the recent renewal of the memorandum of understanding (MOU) involving the two departments and the Railway Association of Canada on the voluntary control of air emissions from locomotives. The MOU illustrates that Transport Canada is slowly moving on its environmental responsibility through this voluntary approach, even though section 47.1(2) of the RSA (regulating the release of pollutants from railway equipment) has been in effect since 1999. We were informed by Environment Canada that its intention is to move from these voluntary guidelines under the MOU to an enforceable regulatory regime under the RSA by the time the MOU expires at the end of 2010.

8.1.3 Provinces and Territories

Provinces and territories have numerous pieces of legislation covering the environment, including their own dangerous goods transportation statutes, and generally have responsibility for environmental matters that occur within their territory. Provincial legislation covers spills on provincial land and into waterways and may also include air quality legislation and provincial rules for the control and use of pesticides. Nevertheless, provinces operate on the basis of a shared framework of environment-related legislation with the federal government when it comes to the railway industry.

Given this array of apparent overlapping authorities and jurisdictions, we were not surprised by the fact that the railway industry feels it is highly regulated on environmental issues. In practice, the "legislative regimes under which rail transport falls appear to be reasonably harmonized and/or complementary and their application largely coordinated by the federal and provincial departments tasked with their administration."[4] As pointed out to the Panel by Environment Canada and others, responding to environmental emergencies is not "black and white," as there are unique circumstances surrounding almost every accident.

A specific area in which both federal and provincial legislation appears to exist is that of the transportation of dangerous goods. As discussed earlier, Transport Canada administers the federal *Transportation of Dangerous Goods Act,* and provinces maintain their own legislation but rely on the federal *TDG Regulations.* The federal TDG Act applies across Canada over all jurisdictions; however, in the case of TDG spills, federal officials generally defer to their provincial counterparts. Both levels of government may intercede and impose orders or levy penalties. Environment

[4] Benoit, *Environment*, op cit., section 3.

Canada normally assumes the role of providing assistance and/or expertise, while the province affected becomes more directly involved in the response effort. Environment Canada has the final say on when the clean-up has been completed at a site on federal land.

To help coordinate federal-provincial responses to environmental emergencies, Regional Environmental Emergency Teams (REETs) have been established as multi-agency, multi-disciplinary groups to provide coordinated advice, information and assistance in responding to emergencies. Membership may also include local government officials, the private sector, aboriginal communities and local residents.

Provinces generally also have railway safety legislation covering other aspects related to the environment, such as the use of pesticides, protection of clean air and water, and contaminated sites.

In terms of response to a railway accident at the local level, other than the train crew, it is normally the local police, ambulance, or fire department that are first on the scene to assess, respond and/or control access to the site of the accident or emergency. However, small and remote communities have limited resources who may have received less-than-adequate training on how to respond to environmental emergencies.

Local governments may adopt by-laws restricting the use of pesticides to control noxious weeds in their communities, but these by-laws would not apply to federal railway lands. The RSA also provides municipalities with an avenue to curtail train whistles within their boundaries, provided that the railway company has been consulted and Transport Canada has given approval.

8.2 ACCIDENTS: PREPAREDNESS AND RESPONSE

While the first priority in a railway accident will always be consideration of the lives put at risk, another priority is protection of the environment. As mentioned above, specific federal and provincial legislation covering the transportation of dangerous goods is well spelled out, generally understood by the railway industry and effectively executed. In most instances, processes and procedures to respond to incidents work well, given the wide variety of interested parties that have to be mobilized to respond. At the federal level, the *Transportation of Dangerous Goods Act* and the Canadian Transport Emergency Centre (CANUTEC), operated by Transport Canada, provide a framework for emergency response to accidents involving dangerous goods.

CANUTEC is a national advisory service provided by Transport Canada to assist emergency response personnel in handling dangerous goods emergencies covering all modes of transportation. It can draw upon a database of chemicals that are manufactured, stored and transported in Canada. The CANUTEC staff of professionals, experienced in interpreting technical information, provides advice when

called upon to do so. The Centre can be reached by telephone seven days a week and 24 hours a day. Federal regulations require that CANUTEC be contacted in the event of a dangerous goods accident or incident, as well as incidents involving infectious substances.

In the case of a train derailment involving a spill, the railway owner is accountable for emergency preparedness and incident management that includes assessing the initial hazard to determine the scope and nature of the response, supervising operations in the field, ensuring an integrated response, and meeting stakeholder needs with regard to information dissemination. The responsibility to respond, coordinate and monitor is shared with provincial authorities. While there could be an overlap of jurisdiction between the federal and provincial governments when federal legislation is involved, cooperation and delineation of responsibilities have been spelled out, in some cases, in formal agreements so that effective coordination and cooperation is achieved. The REETs, mentioned earlier, also play an important role.

Responding to accidents involving spills of dangerous goods has largely been addressed through response plans and procedures established by railway companies. One of the important requirements under the TDG Act and its regulations calls for emergency response assistance plans covering certain harmful dangerous goods that necessitate special expertise and response.

ERAPs are intended to assist local emergency responders in mitigating the consequences of an accident, by providing them with technical experts and specialized equipment at an accident site. ERAPs must include a number of items, such as a description of the emergency response capabilities, and information on the number of qualified individuals available to give technical advice, the number able to assist at the scene, a list of specialized equipment available for use at the scene, the communication systems expected to be used, and copies of any agreements with a third party for the provision of assistance. These mandated plans supplement the emergency response plans of carriers, as well as local and provincial authorities and the REETs. Approval of the ERAP by Transport Canada is required before certain dangerous goods can enter the transportation system.

Emergency response exercises and community outreach activities add to the degree of success that can be expected when an actual incident occurs. Railway companies and industry associations, such as the Canadian Chemical Producers' Association (CCPA), provided us with a number of examples of response preparedness and outreach initiatives that they undertake with responders and local communities that endeavour to mitigate the effects of accidents involving dangerous goods and other types of railway emergencies.

The industry has shown leadership, and two programs in particular are worth mentioning. Responsible Care® and TransCAER are initiatives whereby producers

and carriers take stewardship over their products during their lifecycles and transportation in order to protect people and the environment. Responsible Care, launched by the CCPA in Canada in 1985, and supported by codes of practice, is a unique ethic for the safe and environmentally sound management of chemicals. TransCAER (Transportation Community Awareness and Emergency Response) is focussed on public awareness, dealing with chemical hazards and providing expertise to communities where and when needed.

In addition, the RAC provides railway dangerous goods specialists to assist smaller railways with respect to all aspects of dangerous goods transportation. Part of this initiative includes training for both railway employees and first responders regarding dangerous goods railway incidents.

8.2.1 Dangerous Goods Accidents

Over the last 10 years, the two major railways have increasingly been carrying more freight classified as dangerous goods, in terms of both revenue ton miles and thousands of freight cars moved – both measures have risen by close to 60 per cent.[5] Dangerous goods carried by rail are almost always marshalled in trains consisting of mixed freight.

Regulations made pursuant to the TDG Act set out criteria that define reportable accidents. These criteria include the quantity of dangerous goods released, and the potential for dangerous goods to be released. When more than the minimum quantity specified is released, an immediate report to Transport Canada is required. A report to Transport Canada is also required in the case of a potential release (e.g., when certain cars on a train have derailed, but the dangerous goods cars themselves have not).

According to the Transport Dangerous Goods Directorate of Transport Canada, TDG reportable railway accidents ranged from a low of 45 (in 1997), to a high of 100 (in 2003), for the period from 1997 to 2006. The data showed no tendency for the number of accidents or quantities released to have risen over this period.[6] It is interesting to note that over the five-year period 2002-2006, only 48 of the total of 391 TDG reportable railway accidents (representing 12 per cent) occurred while the dangerous goods were in transit.[7] This demonstrates that the focus needs to be on railway cars in railway yards, on sidings and at loading/unloading facilities.

[5] Joseph Schulman, CPCS Transcom Limited, *The State of Rail Safety in Canada* (August 2007), section 6.1.

[6] Ibid., section 6.2.

[7] Ibid., section 6.2.

TSB regulations[8] for reporting railway accidents and incidents involving dangerous goods use broader reporting criteria than regulations pursuant to the TDG Act. Accidents are reported to the TSB when dangerous goods are involved or rolling stock is known to have carried dangerous goods but the residue has not been purged. It is not necessary to have an actual release of dangerous goods for the accident to be reported to the TSB. Further, under TSB regulations, a railway incident is reportable if rolling stock is not involved in an accident, but dangerous goods have been released, with no minimum quantity stipulated. The number of accidents and incidents reported under the TSB regulations in any given year is significantly higher than those reported in keeping with TDG reporting requirements.

TSB data demonstrates that the combined number of reportable railway accidents and incidents involving dangerous goods fell approximately 50 per cent, from close to 600 to fewer than 300, from 1997 to 2006.[9] An increase in the volume of freight by 60 per cent between 1997 and 2006 (see Figure 2.5), coupled with a decrease in occurrences, demonstrates the extent to which the system is working - and that is due, in large part, to cooperation between the industry and government.

It is the view of the Panel that the TDG program is working well. This is indicated by TSB statistics that are linked to reporting requirements tracking a broad range of railway accidents and incidents involving dangerous goods. There are a number of key success factors for the program, including the requirement for emergency preparedness plans and response protocols, significant improvements to tank cars so that they can withstand collisions, a regulatory framework that allows for provinces to incorporate federal TDG regulations, rigorous enforcement, and railway and industry participation in programs such as Responsible Care.

Nonetheless, there is still great potential for serious harm to people and the environment, and there is always room for improvement in the transportation and handling of these dangerous goods. We expect that, through the implementation of recommendations in this report, railway safety in Canada will improve, and that this will translate into even fewer occurrences involving dangerous goods.

The TDG Act is not designed to prevent railway accidents and cannot ensure that accidents do not happen. Rather, its value is in the legislative framework it provides in terms of planning and prevention, response to dangerous goods accidents, and mitigation of the consequences of accidents.

Despite the best efforts of all involved, railway accidents continue to occur. We heard from many stakeholders that emergency response to major spills has yet to achieve the level of effectiveness and timeliness the public expects. Two contrasting examples

[8] *Transportation Safety Board Regulations* (SOR/92-446), s. 2(1).

[9] Schulman, *State of Rail Safety*, op. cit., section 6.3, Figure 6.4.

most often mentioned to us were the accidents at the Cheakamus River crossing in British Columbia and at Lake Wabamun, Alberta, both of which were investigated and reported by the TSB.

8.2.2 Cheakamus River Accident

On August 5, 2005, nine cars were derailed on a CN freight train proceeding north, adjacent to the Cheakamus River. Eight of the cars were empty and one was loaded with sodium hydroxide (also known as caustic soda). Approximately 40,000 litres of caustic soda spilled into the river, causing extensive environmental damage and killing thousands of fish. In its report, the TSB determined that "although damage to the environment and wildlife in the Cheakamus River was extensive, the multi-agency response to the incident was well coordinated and effective."[10] The contributing factors that led to the unfortunate accident included training issues, the operation of longer trains in mountainous terrain, the marshalling of rail cars, and the impact of distributed locomotive power on braking.[11]

In terms of the multi-agency response, the unified command (UC) system was employed by CN, as called for in its Dangerous Goods Emergency Response Plan, which also serves as its ERAP. The plan facilitates mobilization and efficient and effective use of resources for dangerous goods derailments. Implementation of the UC section of CN's response plan brought together provincial and regional response organizations, federal representatives, the shipper and other resources.

Cheakamus, British Columbia, August 2005

UC is a management concept for coordinating responses to emergency incidents by two or more organizations and provides guidelines for agencies to work together and jointly provide management direction to an incident through a common set of objectives and strategies. The UC system is similar to the internationally recognized emergency or incident response management system known as the incident command system

[10] Transportation Safety Board, Railway Investigation Report R05V0141, Derailment, CN Freight Train Squamish Subdivision, Garibaldi, British Columbia, 05 August 2005 (July 11, 2007), page 24.

[11] Ibid.

(ICS). The ICS model is designed to ensure that leadership, whether jointly or individually held, is quickly established and recognized by all parties, that the jurisdictions of all responders are appropriately respected and their efforts coordinated, and that communications are centralized, accurate and consistent. The ICS model also encourages communities to identify and establish an emergency operations centre that can quickly become functional to provide communications equipment, office supplies and other resources required by responders to manage the emergency. In British Columbia, the ICS model has been adopted by the provincial government and mandated to be used by all provincial government agencies and Crown corporations since 1992. Through the British Columbia Ministry of Environment, two incident management teams have been established, one coastal and the other interior, which are responsible for the delivery of spill response plans.[12]

8.2.3 Lake Wabamun Accident

On August 3, 2005, 43 cars derailed on a CN freight train heading west from Edmonton, adjacent to Lake Wabamun. Twenty-five of the cars were loaded with Bunker C (heavy fuel oil), and one contained pole-treating oil. As a result, approximately 700,000 litres of Bunker C and 88,000 litres of pole-treating oil were spilled, some of which found its way into the lake, and resulted in property and environmental damage. The cause of the accident was determined to be a broken rail. In this case, although CN implemented its Dangerous Goods Emergency Response Plan, the UC section of the plan was not used and response agencies were not brought together as partners. The TSB determined that "the lack of an EOC (emergency operations centre) under the ICS unified command resulted in poor organization and communication, as well as poorly defined roles, responsibilities, and a lack of overall effective joint planning and coordination with emergency responders and government agencies."[13] Further, the TSB notes that "there was considerable confusion among first responders in the first few days, due in part to the lack of a UC structure."[14]

The province of Alberta maintains a Dangerous Goods Incident Support Plan providing a framework for public and private sector responses to incidents that have an impact on the public or the environment. However, at the time of the accident, resources were not in place to support the plan and "in order to protect against the possibility of having to deal with other environmental spills, not all emergency

[12] BC Railway Sector Review on Environmental Emergency Preparedness and Response Capacity: A preliminary analysis of environmental emergency preparedness for train derailments. Jointly produced by the BC Ministry of Environment and Environment Canada; December 2006, page 17.

[13] Transportation Safety Board, Railway Investigation Report R05E0059, Derailment, CN Freight Train Edson Subdivision, Wabamun, Alberta. 03 August 2005 (October 25, 2007), page 23.

[14] Ibid., page 31.

equipment available in Alberta was deployed to the Lake Wabamun accident site."[15] In the aftermath of the accident, the Alberta government established a commission to look into how to improve its handling of environmental protection.[16] Most importantly, the commission made a number of recommendations designed to strengthen the province's emergency management system, including adopting the ICS across Alberta to ensure effective coordination during emergencies.

A comparison of the Cheakamus River and Lake Wabamun accidents reveals that the response differed, in part, due to the nature of the spilled commodities. The caustic soda spilled in the British Columbia accident involved a dangerous good as described under the TDG legislation. Neither the Bunker C nor the pole-treating oil spilled in Alberta were classified as dangerous goods.[17] This important difference may have affected CN's decisions about, and responses to, the two accidents.

Under the TDG legislation, precise procedures and protocols must be followed and when dangerous goods are involved in a transportation accident the federal government becomes involved. The response protocol for environmentally hazardous goods (i.e., unregulated goods that pose a significant threat to the environment and/or human health) is less clear. For accidents not involving a dangerous good, the CN Dangerous Goods Emergency Response Plan did not automatically invoke the establishment of a unified emergency operations centre that would have included a wider array of provincial and federal representatives. This was one of the problems at Lake Wabamun, as pointed out by the TSB in its investigation report.

> At the Wabamun derailment there was confusion over what the train was carrying that led to confusing messages to our members and increased anxiety.
>
> United Steelworkers Submission, *View From The Track*, page 11.

Other TDG requirements, such as placards on the rail cars identifying their contents, something that would be important to first responders, are also not required for the transport of environmentally hazardous goods. As the TSB found, "the hazardous properties of Bunker C and pole-treating oil were not understood and effectively communicated to enable preventive mitigation of the associated risks to residents, workers and the environment."[18]

[15] Ibid., pages 24, 31.

[16] Alberta Environment, Alberta Environmental Protection Commission, *Learning the Lessons and Building Change: A Review of Alberta's Environmental and Emergency Response Capacity* (2005).

[17] The Bunker C was not classified as a "dangerous good" under the TDG Act because it was never at a temperature greater than or equal to its flashpoint at any time while in transit.

[18] TSB Wabamun Report R05E0059, op. cit., page 27.

It should be pointed out that since the two accidents mentioned above, CN has taken additional measures such as ensuring additional response equipment capabilities are available, strengthening its dangerous goods program, including enhanced public outreach, and extending its various emergency response plans to cover all emergencies and not just those involving dangerous goods.

8.2.4 Towards a New Protocol

Through the two examples of accidents in British Columbia and Alberta, and as a result of our public consultations, we learned that there is a robust regime for responding to spills involving dangerous goods as defined by the *Transportation of Dangerous Goods Act,* but that a gap exists with respect to environmentally hazardous goods. Whether a dangerous good or an environmentally hazardous good is involved, other factors, such as the remoteness of the spill location, the weather, slow or incomplete communication of facts, or the lack of available resources can also hinder the response and clean-up efforts. A common complaint we heard from many stakeholder groups was not knowing "who's in charge." Clear and accurate information is needed in cases when many participants from various levels of government are activated to respond to an accident.

We were quite surprised to learn that the Lake Wabamun accident did not involve dangerous goods and that the response and role of authorities was not as vigorous as it could have been. The commission established by the Alberta government to review the accident found that "the [provincial] Dangerous Goods Incident Support Plan was never triggered for the spill … because it didn't involve products regulated as dangerous goods," and that "this contributed to a situation where resources weren't activated."[19] This observation also recognizes a major gap between responses to dangerous goods accidents and those involving environmentally hazardous goods.

In both the British Columbia and Alberta spills, provincial authorities were involved in the response effort, but to varying degrees and with different levels of success. As a Panel, we did not look into the response effort for these two spills in great detail apart from the reports already quoted, but note there were significant differences between the two responses, even though they involved the same railway company, and on the surface, appeared to be of a similar type. There were differences in the initial assessment of the accident; the identification of the product and the determination of how much of it had spilled; the speed with which resources were deployed to contain and clean up the spill; and the extent to which provincial, federal and local communities were kept informed. At the Lake Wabamun spill, it appeared to some in the local community that the railway devoted too much effort to re-opening the rail line and not enough on clean-up activities. This has been attributed to the fact that CN had to wait for additional clean-up equipment to be brought from afar.

[19] Alberta Environmental Protection Commission, *Learning the Lessons*, op. cit., page 11.

As noted above, organizing a response effort is critical, albeit for a dangerous goods incident or other railway emergency. Some provinces and many organizations employ a form of uniform command or incident command system to coordinate activities of more than one party.

Another emergency response model worth mentioning is the Canadian Standards Association Emergency Response Standard, established to inform businesses and public organizations about planning, administration, training, resource utilization, auditing and other aspects of emergency preparedness and response.[20] The standard is designed to establish minimum criteria for the effective response to emergency situations and could also be used as a point of reference in developing response plans to all types of derailments and spills. The basic premise of this standard is the need for prior agreement on how a response effort is to be organized between parties. These issues must be addressed in the planning and preparedness stage of any successful response plan and then must be tested through exercises, and regularly updated.

As pointed out in the discussion above, environmentally hazardous goods carried in rail cars do not require an ERAP or other protocols provided for the transportation of dangerous goods under the TDG Act. Basic procedures, such as accurately tracking the contents and location of an individual rail car that could be carrying an environmentally hazardous good, and placarding these rail cars, are not currently required.[21] Railway personnel and first responders must be able to readily identify what each rail car contains, in the event of an accident.[22] Such a gap is certainly troubling when one considers the risk to first responders as well as to railway personnel. This situation should be remedied through the development of a new protocol dealing with the transportation by rail of environmentally hazardous goods.

The lack of a regulatory regime governing the transportation of environmentally hazardous goods is one of the greatest concerns to the Panel. When accidentally released from a rail car, environmentally hazardous goods can pose a serious risk to people, property and the environment. The Lake Wabamun spill is a good example. Given that some of the properties of pole-treating oil are detrimental to human health, we had expected it to be classified as a dangerous good. Further, the spill of Bunker C resulted in the death of many birds and contamination of the lake. Even goods not thought of as hazardous in small quantities can be potentially lethal to fish and wildlife when spilled into the environment in large amounts. Considering

[20] Canadian Standards Association website: www.csa.ca.

[21] Under the TDG Act, identifying dangerous goods on the outside of a railcar (marking with approved signs, or "placards") is a legislated requirement; placarding is not required for environmentally hazardous goods that are not subject to the Act.

[22] Manifests are normally carried in the locomotive that should contain information on the contents of each railcar in the train.

that great lengths of the national rail system follow rivers and lake shores, and pass through countless communities, it is especially important to ensure that all spills are accorded a high level of preparedness and response.

The treatment of environmentally hazardous goods that do not come under protocols, such as those imposed under the *Transportation of Dangerous Goods Act,* needs to be addressed. We see an urgent requirement for the development of a federal protocol that can attend to assigning roles and responsibilities designed to improve the planning, preparedness, reporting and response to accidents and incidents involving the transportation of environmentally hazardous goods. Such a protocol should use the TDG Act as a model, and involve consideration of possible legislation, regulations and standards that would provide comprehensive direction to the railway industry and shippers. Hazard assessment, response structure and incident management, roles and responsibilities, product response plans (similar to an ERAP), emergency response plans, training and awareness, as well as sharing information and best practices, are elements of the protocol that would need to be addressed through a collaborative effort involving federal, provincial and industry stakeholders.

The TSB investigation report into the Lake Wabamun spill expressed concern that "Environment Canada has not established environmental response protocols with its provincial counterparts to ensure an adequate and comprehensive early response to environmental damage as a result of rail transportation accidents."[23] Care needs to be taken to coordinate any efforts on the part of Transport Canada and Environment Canada in this regard.

RECOMMENDATION 38

Transport Canada, in conjunction with all stakeholders, should develop a protocol for emergency response to spills of environmentally hazardous goods that are not designated as "dangerous goods" under the *Transportation of Dangerous Goods Act*.

8.2.5 Environmental and Emergency Response Standards

During many of our consultation sessions, and in written submissions, the capacity of local emergency personnel to respond to derailments and environmental spills was a recurring issue. This was particularly the case for derailments and spills that occur in small communities or remote areas where the response capacity can be overwhelmed. While preparedness of communities is a provincial matter and outside the purview of the RSA, the railway industry must take into account such eventualities and plan for all types of responses. For instance, if the railway regularly carries predictable quantities of products, it should conduct a risk assessment and have a plan in place for deploying response resources necessary to contain and clean up any

[23] TSB Wabamun Report R05E0059, op. cit., page 32.

spill. Developing plans, exercising them and communicating with others who would be involved with the response should be an ongoing responsibility of the railway companies.

We heard from the railway industry and others that railways have emergency plans and undertake outreach and awareness efforts with local communities and first responders to provide them with information, courses and briefings. Railways and industry associations certainly should be commended for taking proactive measures such as these, and for attempting to build partnerships. We understand the difficulty of reaching every community, given the magnitude of such an effort and the many different community groups that take an interest in public safety and protection of the environment. Yet many informed us that they feel there is a lack of communication and awareness regarding emergency preparedness and response to railway emergencies.

> At the end of day one, residents had yet to receive any direct communication from CN officials, Transport Canada, Environment Canada, Alberta Environment or Capital Health (the regional health authority), regarding the nature of the spill, the safety of our water or the disaster control plan.
>
> Lake Wabamun Residents Committee Submission, page 3.

In some regions of Canada, we sense that there is a lack of confidence in the ability of railways to ensure that the right things are done at the right time – responses to a few incidents that do not meet the level of expectation of the public can quickly destroy trust in the railways. In other locations, there may be a sense of apathy until some accident or emergency affects the community, and then a sense of outrage emerges when the impression is that more could have and should have been done. Building lines of communication and trust between railways, communities and local citizens is essential in preparing for and responding effectively to emergencies.

When an accident happens, the first to be informed and to arrive on the scene are usually the railway operator (including the train crew) and local authorities, such as police, ambulance and fire departments. Other resources and agencies arrive as required in due time. In a CP submission,[24] the company sets out the four priorities that guide its response to train accidents. The first is ensuring the safety of railway employees and of the community affected. Protecting the environment is second. Identifying and preserving all key evidence for future cause-finding and corrective action is the third priority. Finally, safely restoring railway operations takes place after the safety of people and the environment has been assured. Such priorities should be evident in all response plans and in the protocol recommended above.

[24] Canadian Pacific Railway Company, "Safety Demands Continuous Improvement," *Opening Submission* (April 2007), page 14.

> There are a much wider variety of train incidents/ emergencies of concern to a municipality – through their emergency services and public – than those falling under dangerous goods legislation.
>
> Strathcona County Submission.

Many local government authorities and others brought to our attention their concerns for the safety of their responders and citizenry. It appears that the railways have taken many initiatives, but that things can always be improved, such as identifying the environmentally hazardous goods contained in rail cars. Railways and authorities also need to quickly and accurately evaluate the extent of a spilled commodity, or likelihood of a spill, so that the response effort can be mobilized to deal with the maximum amount of material potentially involved, not the minimum. It is better to assume the worst-case scenario until evidence to the contrary is confirmed. Full disclosure of known facts to the authorities and the public as soon as possible can allay fears of environmental calamity or human health risk.

At the federal level, there is room for action under the *Railway Safety Act* to help guide the industry and other stakeholders towards a state of readiness to deal with environmental accidents involving both dangerous goods and environmentally hazardous goods in the railway mode. Building on our recommendation above, we feel that Transport Canada should develop a standard of emergency response to spills of dangerous goods, environmentally hazardous goods and other goods, in conjunction with the railway industry and other interested parties. The standard should consider such things as performance standards for railway and third-party responses to a spill, target response times in rural and urban locations for specific numbers of personnel and quantities of equipment to be on-site, worst-case scenarios, and timetables for training and exercising of plans.

For example, in the marine mode, Transport Canada has enabled the creation of certified response organizations and set standards for responding to oil spills. Ships operating in defined Canadian waters must have an arrangement with a certified response organization capable of responding to ship-source oil spills. Depending on the amount of oil spilled and its location, a specified response capability, in terms of time and effort, has been established by response organizations and approved by Transport Canada. When developing a railway response standard, it would be worthwhile to examine the marine example and others that may be found in the different modes of transportation and jurisdictions. At the same time, it would be worthwhile to consider passenger rail preparedness and response to accidents to ensure that resources and procedures are in place and up-to-date for this sector as well.

RECOMMENDATION 39

Transport Canada, in conjunction with the industry, should establish a Canadian standard of emergency response for the railway industry (for dangerous goods, environmentally hazardous goods and other goods).

8.3 OTHER ENVIRONMENTAL ISSUES

In addition to the obvious environmental issue of dealing with railway accident spills, a number of other environment-related issues were raised during our consultations. Some of these issues warrant attention, and while we have not made individual formal recommendations on each subject, nevertheless, we would expect our suggestions to be carefully considered for possible action.

8.3.1 Pesticide Use

The RSA authorizes the removal of vegetation and trees from railway rights-of-way as a safety precaution to improve visibility and reduce fire hazards. The legislation is not prescriptive in how this should be accomplished. Using pesticides is likely the least expensive and most effective means available and is widely used by the railway industry. At present, railways must apply for permits from each province in which they operate to undertake spraying. This has resulted in a patchwork of regulatory requirements, as rules are not consistent across all provinces. Railways would welcome federal regulation that would standardize the rules governing the application of pesticides and eliminate the requirement for provincial permits.

As with lawn spraying, many people and some municipalities oppose spraying on railway lands, particularly along municipal corridors. A number of municipalities across Canada have banned spraying of lawns in their communities and have asked railways to comply with the ban. Because railway lands fall under the jurisdiction of federal authorities, municipalities have little influence over railways in these matters. The RSA provides for the Governor in Council to make regulations respecting the use of alternatives to chemical pesticides for removing brush and weeds along railway lines (section 24.1(e)(iii)), but no regulation has been created. The issue of pesticide use could be a topic for discussion at the Federal-Provincial Working Group on Railway Safety, or as a proximity related item between the Federation of Canadian Municipalities and the railway industry. The Rail Safety Directorate may also consider making regulations on the use of alternatives to chemical pesticides in collaboration with the railway industry and other interested parties.

8.3.2 Railway Yard Spills

A result of the many years of railway operations is the impact on the soil and water in and around railway yards. Accumulated spills of relatively minor quantities of products, such as those used in the maintenance of railway rolling stock, and the occasional leakage or spill of dangerous and environmentally hazardous goods in railway yards, may result in a contaminated site over time. Environment Canada has jurisdiction over land and water contamination on these federal lands, while Transport Canada oversees railway operations. Large reportable spills are normally subject to specific clean-up protocols and timetables according to either federal or provincial requirements.

Numerous small spills that may not be required to be reported to regulatory authorities may build up over a long period and can become a problem. Railways try to contain and clean up such spills through a variety of measures, but are not always completely successful. It is highly likely that site remediation of railway yards would be necessary to reduce the toxic substances in the soil and water table - something that would not normally be required until their use as railway yards changes. Certainly, the owner of the land is responsible for operating in an environmentally sustainable manner and for site remediation.

We have perceived a gap between federal authorities in monitoring leakages and spills of dangerous goods and environmentally hazardous goods in railway yards. In most cases, Environment Canada expects the transportation regulator to intercede, since it is related to train operations, while the Transport Canada railway safety inspector is not sufficiently trained or knowledgeable to assess site contamination. As a result of this dichotomy, we believe that more can and should be done by the industry to prevent occurrences in railway yards, including responding quickly to clean up any spilled material that threatens the environment. The federal government also needs to become more proactive in performing a monitoring role and should clearly establish a lead authority on this matter.

8.3.3 Air Emissions

Transport Canada has the potential to regulate the release of pollutants from the operation of railway equipment into the environment (section 47.1(2) of the RSA). However, no regulations under this provision have been promulgated. Climate change is a major concern these days, and the Panel is pleased to give credit to the railway industry, Transport Canada and Environment Canada for the May 2007 renewal of the memorandum of understanding on reducing railway air emissions that contribute to greenhouse gases.

Under the MOU, voluntary targets have been established for major freight railways, short line railways, intercity passenger rail and commuter rail services. The 2010 greenhouse gas reduction target for the major freight railways represents a 44 per

cent improvement from 1990-2010.[25] Part of the action plan calls for the major railways to purchase only new locomotives certified by the U.S. Environmental Protection Agency (EPA), and to upgrade existing in-service locomotives when they are overhauled, beginning in 2010, to the EPA standards in effect at that time. The MOU, with its voluntary targets, which expires on December 31, 2010, is expected to be replaced by regulations under the RSA.

Given the length of time required to develop regulations, especially in the area of environmental protection, the Panel feels it would be appropriate for Transport Canada and Environment Canada to commence stakeholder consultations with the railway industry in this regard, with the expectation that enforceable regulations can be put in place beginning January 1, 2011, when the MOU expires.

8.3.4 Grain Spills and Other "Littering"

During our consultations, we received numerous verbal and written submissions pointing out that the contents of many grain cars leak onto railway tracks. Animals attracted to the spills are then exposed to the danger of being hit by a train. In addition, grazing wildlife, such as grizzly bears in national parks, pose a risk to railway employees who have to leave the locomotive and walk the length of train to inspect rail cars. The problem is not confined to grain, but extends to other commodities, such as wood chips, coal dust or plastic pellets. If these commodities are not handled and treated appropriately, they can be released from railway cars either en route or in railway yards.[26] We are concerned about this sort of "littering."

Approximately 12,000 railway hopper cars in the Government of Canada fleet are used by CN and CP railways, free of lease costs to the railway, to move regulated western grain to ports. The railways have day-to-day control of the cars and allocate them to grain shippers on a commercial basis. Under new agreements between the railway companies and the Government of Canada, both CN and CP have agreed to undertake a hopper car inspection and refurbishment program addressing both safety and non-safety components. In particular, because cars operated by CP had an inadequately designed gate, CP will be replacing poor-performing discharge gates on the federal grain cars it operates, thereby reducing leakage. CN is also obligated under the new agreement to inspect all discharge gates and make repairs, as required. Each year of the first five years of the refurbishment program, Transport Canada will conduct an inspection of refurbished cars to assess that all necessary work has been performed.

[25] Transport Canada, "On Track Towards a Cleaner, Greener Rail System," *News Release No. GC 018/07* (May 15, 2007).

[26] The railways sometimes use vacuum trucks to pick up spilled materials but such attempts cannot be employed across the vast rail network with complete success.

8.3.5 Noise

There is no legislation or regulation dealing with noise levels created by railway operations except for the RSA provisions on whistling. Apart from whistling, most railway noise, except the noise of a passing train, is generated from level crossing bells and shunting operations in and around railway yards. Discussion of this topic can be found in Chapter 7.

8.3.6 Environmental Management Plans

The issues we have discussed need to be addressed in a more disciplined fashion. The RSA provides for the regulator to make regulations or rules governing the protection of the environment in a number of areas, and Transport Canada, Rail Safety Directorate should be giving greater attention and priority to dealing with its environmental objectives.

To ensure that the railway industry is operating in an environmentally responsible manner, Transport Canada as regulator, should take appropriate action. The Panel is of the view that environmental management plans should be submitted by railway companies to the department. In collaboration with Environment Canada, Transport Canada should review the content and scope of such plans in order to establish common, basic criteria. Consideration of how to monitor and/or audit these plans also needs to be addressed. Such plans would be reviewed and updated annually by railway companies with changes being submitted to the regulator. Companies would be expected to audit their plans periodically and provide audit results to Transport Canada. This process could be incorporated as a new requirement under the existing safety management system regulations. Environmental management plans should focus on current issues and be "forward looking."

RECOMMENDATION 40

Railway companies should file annual environmental management plans and regular compliance audits with Transport Canada. These plans should address, among other issues, pollution of railway property (i.e., yards and railway rights-of-way).

8.3.7 Fires Caused by Railways

Forest fires and other brush fires, including those caused by railway operations, can become a serious threat to the public and the environment. Fires along railway rights-of-way can be caused by a number of railway activities, including rail grinding and welding, braking operations or the exhaust of locomotives. Fires can also be caused by non-railway activities, such as by campers or lightning strikes.

Forest fire management responsibilities reside with natural resource management agencies of provincial and territorial governments. In national parks, Parks Canada has a forest fire management mandate.

According to the Canadian Interagency Forest Fire Centre (CIFFC), more than 140 fires associated with railway operations are started each year in territory outside municipal areas.[27] CIFFC is a non-profit corporation that represents a partnership among provincial, territorial and federal government agencies responsible for forest fire management in Canada. The Centre has an operational arm that gathers, analyzes and disseminates fire management information to facilitate sharing of forest firefighting resources across Canada, including equipment, personnel and aircraft. Planning and preparation, as well as education and awareness activities, are important for success in fighting forest fires.

Most of the railway-caused fires are extinguished while they are still small, but some cannot be contained and grow to cause significant damage. CIFFC estimates that railway fires are responsible for roughly 17,700 hectares burnt on average each year, and it has spent approximately $6.4 million per year over the last 10 years suppressing such fires.[28] Railways have not been complacent and have taken several measures over the years to reduce the probability of fires along their rights-of-way, including equipment and operating practice modifications. An example is the installation of spark arrestors on locomotive exhaust stacks.

While fire suppression agencies will normally pursue recovery of costs associated with fires they attribute to railway companies, we were informed that railways often challenge such action. Perhaps one of the motivations for companies to challenge cause determination is that such determinations are carried out by fire authorities without the participation of railways, and railways are not always convinced that their rail operation was indeed the cause.

We understand that, in many cases, railways do rely on public firefighting agencies to combat fires attributed to them. However, we also heard that these firefighting agencies are obligated to pursue cost recovery. Court challenges create delays and added costs which are borne by both parties. While the Panel certainly supports due process in legal proceedings, we are very concerned that processes surrounding the determination of cause, and the forum by which resolution of disputes is arrived at, have not been made clearer.

Under the RSA, *Rules for the Control and Prevention of Fires on Railway Rights-of-Way* were developed in 1995 by the Railway Association of Canada on behalf of railway

[27] Canadian Interagency Forest Fire Centre (CIFFC), *Wildland Fires Resulting From Railway Operations - A Public Safety Threat, Submission to the Advisory Panel, RSA Review* (July 2007) page 2.

[28] Ibid., pages 4-5.

companies. The rules require railway companies to ensure that suitable measures are in place to prevent and control fires on railway rights-of-way through training of personnel, fire prevention and control plans, prevention and hazard reduction practices and sufficient personnel for fire patrol and firefighting requirements. The rules clearly state that it is the responsibility of the railway company to extinguish all fires on railway rights-of-way, irrespective of the manner in which the fires were started, and fires off the right-of-way that were started or presumed to have been started as a result of railway operations.

These rules appear to be lacking in several respects. There are no compliance or enforcement provisions and no penalties or incentives. Although the rules clearly state that the railway company is responsible for extinguishing the fire, they are open to interpretation as to liability and associated costs. Further, the rules are silent on cost recovery, a process for determination of cause, and a forum for deciding apportionment of cost. The rules assign no role to railway safety inspectors. Fire service inspectors (provincial authorities) are cited but they are not sufficiently familiar with railway operations to take effective action.

Clearly, there is a requirement for these rules to be revisited. Given that fires caused by railways affect third parties, well beyond the purview of Transport Canada and the railways, it would be more appropriate to rewrite the rules pertaining to the prevention and control of fires associated with railway operations as a new regulation. This should be a collaborative effort involving railway companies, firefighting agencies and the regulator, and should take into account provisions for apportioning firefighting costs and settling disputes, if they were to occur.

RECOMMENDATION 41

The *Rules for the Control and Prevention of Fires on Railway Rights-of-Way* are neither effective nor enforced, nor do they provide for an adequate process for compensation. Since these rules involve third parties, they should be replaced by regulations.

To sum up, the Panel concludes that Transport Canada needs to increase its capacity to fulfill its environmental obligations under the RSA and needs to be more proactive. Environmental issues are destined to become even more important as the challenges they present become more pronounced. As discussed in Chapter 11, resources will need to be devoted to fulfill this important role.

RECOMMENDATION 42

Transport Canada should develop sufficient capacity and expertise to ensure appropriate oversight of the railway industry with regard to all aspects of environmental protection.

CHAPTER 9
OPERATIONAL ISSUES

Over the course of the public consultations, the Panel heard comments on a number of operational issues and safety concerns. Submissions were received outlining concerns from many presenters on issues such as fatigue management, locomotive design, event and voice recorders, rail traffic control locations, track and infrastructure, training, train dynamics and drug and alcohol programs.

For the most part, operational issues stem from the operation of trains and the impact on their crews. As we discussed in Chapter 5, the rail industry has evolved, but it still remains rule-driven. These rules have been the mainstay for controlling train movements and reducing or preventing accidents and, in many cases, have become the basis for determining accident causation. As the science of human factors has grown, however, this approach, as a primary way to prevent human factor-related accidents, is in question.

Accidents and incidents are rarely the result of a single cause. Rather, they occur as a result of the combination of failures or deficiencies in organizational policy and procedures, human actions and equipment.[1] This complexity necessitates that both the proximate and underlying causes, as well as their interrelationships, be considered in investigations. Unfortunately, conventional accident investigation processes tend to stop when a proximate cause is found, such as a rule not being followed.[2] We believe that improving the overall safety culture of an organization is, ultimately, a better approach than simply correcting a single operator's localized behaviour. We are convinced that this will have a positive impact on addressing many of the operational issues that were brought to our attention.

9.1 FATIGUE MANAGEMENT

Fatigue within the railway environment is a significant problem. The Panel heard that, in some cases, locomotive engineers are reporting for work insufficiently rested and are worried for their safety. We have recognized that there is a clear relationship among the regulated *Work/Rest Rules*, the collective agreements between operating employees and companies, and the need for effective fatigue management plans. Given the complex operating environment of the railway system, these relationships must be in harmony.

[1] Maury Hill and Associates, Inc., Adaptive Safety Concepts, *A Study of the Role of Human Factors in Railway Occurrences and Possible Mitigation Strategies* (August 2007), section 2, "Conceptual Frameworks for the Human Factor;" section 3, "A Definition."

[2] Ibid., section 3.

Until the 1980s, the hours of work for railway operating employees were not subject to regulation. These employees were exempt from Part II of the *Canada Labour Code* and there were no restrictions on their hours of work and rest other than their collective agreements. This changed after a passenger train and freight train collided head-on outside Hinton, Alberta in 1986. Crew fatigue was found to have played a major role. In 1987, the Canadian Transport Commission issued interim orders mandating minimum off-duty time for railway operating employees. The interim orders were replaced with a railway-written *Rule Respecting Mandatory Off-Duty Time*, which was approved by Transport Canada in July 1993, on the condition that the industry, through the Railway Association of Canada (RAC), develop a second rule setting out the maximum hours of work for such employees (i.e., the *Work/Rest Rules*). A working group was struck which included members of the RAC and union representatives.

The rail mode is unique in the world of transportation because of the difficulty for the major freight railways in scheduling work assignments in advance. Throughout our consultations and research, we were informed that work scheduling can have positive effects on fatigue management. We learned that such positive effects were more noticeable in eastern than in western Canada, due to better scheduling.

Some of the causes of fatigue are uncertainty about the time of one's next assignment, excessive working hours, long commutes and waiting times before beginning work, unsatisfactory conditions for sleeping at some "away-from-home" terminals, and personal decisions not to rest during the day, even when subject to call the next night. The working group considered all of these factors.

THE CANALERT '95 STUDY RECOMMENDED THAT THE FOLLOWING FATIGUE COUNTERMEASURES BE PUT INTO PLACE:

- Provide regular and predictable duty periods;
- Require rest after outbound night runs and prior to overnight return runs;
- Implement napping strategies system-wide;
- Exempt napping train crews from train inspection responsibilities;
- Install reclining seats in locomotive cabs;
- Modify bunkhouse rooms for improved daytime sleep;
- Install locomotive cab audio systems;
- Conduct and extend lifestyle-training programs; and
- Train rail traffic controllers and crew callers in fatigue strategies.

During the development of the *Work/Rest Rules*, working group members found that the issue of fatigue was much more complex than first anticipated. The working group realized that it would need a more thorough understanding of fatigue and its impact on train crew alertness. A wide-ranging study was undertaken to provide greater understanding and insight into the issue of crew alertness and, if possible, to develop a set of fatigue countermeasures, which would enhance alertness levels without affecting operations.

The report produced by this study, entitled *Alertness Assurance in the Canadian Railways* or CANALERT '95,[3] was completed in 1995 and published in 1996. In brief, this comprehensive study concluded that even in the unique environment of the railway industry, there are fatigue countermeasures that, when implemented and complied with, would significantly reduce the negative effects of fatigue on safe train operations. These countermeasures, in fact, resulted in a corresponding improvement in job satisfaction for the group of engineers involved in the study.

The CANALERT '95 study used a sample of locomotive engineers from two subdivisions (one from CP and one from CN) who operated trains under typical but stressful mountainous railway operating conditions. These engineers were scientifically monitored during both awake and operational periods, as well as during rest and sleep periods, to establish a baseline and then to assess any gains of a proposed fatigue countermeasure. The study found that a significant improvement to alertness was possible and concluded that fatigue is a real issue in Canadian railways; hours of work and rest regulations cannot guarantee protection against fatigue; fatigue countermeasures can be successfully implemented in railway operations; circadian sleep and alertness principles are effective in addressing employee fatigue in railway operations; countermeasure effectiveness requires countermeasure compliance; and maintaining alertness is a joint responsibility of employees and management.

Armed with the CANALERT '95 study results, the working group, led by the Railway Association of Canada, developed the *Work/Rest Rules*, which attempted to balance the interests of the railways (safe and cost-effective crewing of their trains), of employees (quality of life and incomes) and the public interest in safe railway transportation.

The working group, which was joined by a representative of Transport Canada's Rail Safety Directorate, finalized the *Work/Rest Rules for Rail Operating Employees* and an interpretation document, known as *Circular 14 – Recommended Procedures and Practices for the Application of Work/Rest Rules.* These finally came into effect in April 2003, some seven years after the publication of the CANALERT '95 recommendations. Transport Canada, Rail Safety Directorate immediately began to hear

[3] Moore-Ede, Martin et al., *Alertness Assurance in the Canadian Railways: Phase II Report (CANALERT '95)*, Circadian Technologies, Inc. (May 1996).

concerns from the industry and railway employees about inadequate features of the rules and attempted to correct them.

Following subsequent work and several meetings between the RAC and Transport Canada, Rail Safety Directorate, the *2005 Work/Rest Rules for Railway Operating Employees* (the "*Work/Rest Rules*") were developed and implemented, replacing the 2003 version.

While examining this issue, the Panel learned that recent research into the effects of fatigue in an occupational setting involving continuous operations has led to several key findings.[4] Some of these findings can assist in the effective management of fatigue issues and should be considered in the establishment of safety minimum rules that are meant to apply across an entire sector or industry. For example, sleep deprivation will result in cognitive performance deficits; disruption of circadian rhythms will lead to a decrease in performance; human beings are not very good at estimating their current level of alertness; and most importantly, time off, by itself, may not guarantee a rested workforce.

Further, research has found that the magnitude of the negative effects of fatigue will vary by individual. While fatigue research provides a variety of measures to illustrate the magnitude of the performance decreases, one of the more interesting – or alarming – comparisons was presented to the Panel in a research paper,[5] which pointed to tests that demonstrated that the effects on performance of working for 18 hours can be equivalent to the effects of a blood alcohol level of 0.05 per cent or greater.

EIGHT IMPORTANT FATIGUE MANAGEMENT CRITERIA

1. Time of day
2. Circadian rhythms
3. Duration of opportunity for sleep
4. Sleep quality
5. Predictability (of start time)
6. Sleep debt (extended sleep period)
7. Time on task
8. Short breaks

A 2005 Australian study on *Working Hours Regulation and Fatigue in Transportation* compared the regulations applying in four modes of transportation in four countries, and outlined eight important fatigue management criteria for such regulations.[6]

Given the research on this subject, the Panel shares some of Transport Canada's reservations about the content of the 2003 *Work/Rest Rules*. Common sense causes us to question the safety value of legislated rules allowing, or one could say encouraging,

[4] Maury Hill, *Human Factors*, op. cit., section 4, "Summary of Effects of Fatigue on Performance."

[5] Ibid., section 4.

[6] Harvey Sims, Sussex Circle Inc., *The Development of Work/ Rest Rules for Railway Operating Employees: A Case Study Prepared for the Railway Safety Act Review Panel* (August 2007), paragraphs 43, 204 and Annex 6.

railway engineers and other operating employees to work two shifts in a row (up to 18 hours in a 24-hour period) with as little as a coffee or meal break between shifts.[7] Further, the 2005 *Work/Rest Rules* still allow for a maximum combined on-duty time of 18 hours. Requirements for rest are expressed in terms of "off-duty" times, rather than opportunities for sleep. This distinction is important because expressing requirements in terms of opportunities for sleep would support the principle that sleep is the important element, not just time "off duty."

The *Work/Rest Rules* also rely on the ability of operators to judge their own level of fatigue, when the research is clear that people (especially sleep-deprived individuals) are very poor judges of their fatigued state and do not reliably estimate their alertness and performance.[8]

Given these research findings, it is the Panel's opinion that the current version of the rules needs improvement.

In conjunction with the *Work/Rest Rules*, the working group intended that some of the fatigue countermeasures to improve alertness levels would be addressed in railway companies' fatigue management plans. The rules require fatigue management plans to be implemented by railway companies and considerable importance was initially placed on the development of these plans. They were to address key issues such as work scheduling, training, on-the-job alertness strategies, rest environments, work environments and unusual circumstances.

In fact, *the Work/Rest Rules* require that these plans be developed collaboratively between management and unions and be designed to reduce fatigue and improve on-duty alertness. They are also to reflect the nature of a specific operation such as "work trains" on a particular territory, and consider significant detail such as traffic patterns, traffic density, train length and geographic considerations, to name just a few.

We learned that fatigue management plans have been developed and submitted to Transport Canada, Rail Safety Directorate by all railway companies. To be effectively implemented, an evaluation of the plans would assess their comprehensiveness and whether or not all requirements provided in the *Work/Rest Rules* and the conclusions of fatigue science are being considered. These assessments would include an evaluation of human factors.

While there appears to be strong acceptance within the Transport Canada, Rail Safety Directorate for the role of human factors, there is equally clear acknowledgement that the Directorate does not have adequately qualified people to assess

[7] Circular 14, pages 7-9, quoted in Sims, Sussex Circle, *Work/ Rest Rules Case Study*, op. cit., Annex 1.

[8] Maury Hill, *Human Factors*, op. cit., section 4, "Fatigue in Railway Operations."

human factors science with respect to fatigue issues. Although railway companies have filed these plans with Transport Canada, we are not clear whether the plans meet the requirements of current human factors science and have been thoroughly evaluated by the Rail Safety Directorate. Furthermore, we do not believe that the content of these fatigue management plans has been incorporated in the Rail Safety Directorate's ongoing compliance monitoring program to ensure that the plans are being applied and are effective.

Given that some of these research findings are counterintuitive, it is imperative that education, planning and predictability are instilled within an organization to maximize utilization of work/rest schedules. If these factors are considered from the outset, developing work programs or basic rest standards will then be complementary to working conditions and to sound collective agreement negotiations that can lead to agreements providing for adequate rest periods. Any difficulties and problem areas can be dealt with in functional fatigue management plans developed in keeping with current fatigue science.

There is a shared responsibility between railway management and unions to ensure that collective agreements do not compromise any positive alertness level gains that may be forthcoming from the fatigue management plans or provisions of the *Work/Rest Rules*. Issues such as time away from work, and rates of pay must complement the *Work/Rest Rules* and the provisions of the company's fatigue management plans.

It seems that at the time of the CANALERT '95 study, Canada was on the leading edge of incorporating the key elements of fatigue research into the railway-operating environment; however, it would appear that Canada has since lost momentum.

RECOMMENDATION 43

Fatigue management is dealt with in complementary ways, such as work/rest rules, fatigue management plans, and terms and conditions of employment.

- **The current *Work/Rest Rules* do not provide a satisfactory baseline framework for managing the risks associated with fatigue in rail operations. The rules should be amended to better reflect current science on fatigue management.**
- **A robust system of fatigue management plans is needed. Transport Canada should audit them as it does for safety management system plans.**
- **Fatigue management is also an issue that railways and employees should address in the establishment of terms and conditions of employment.**

9.2 LOCOMOTIVE EVENT AND VOICE RECORDERS

Electronic data recording equipment is required to some extent in all transportation modes in Canada, with the exception of highways. At this time, data event recorders are required on a locomotive by regulation (rather than voice recorders which are used in the aviation industry).

Event recorders continuously record speed, throttle settings and other information, and are used on all main track locomotives. In the United States, this data has been recorded, typically, on magnetic tape. In Canada, however, we have been using an improved solid-state electronic memory module to store this data. Accident investigators use the data to provide valuable insight into the circumstances leading to railway accidents and incidents. The data is easily accessible to the railway company for operational and/or maintenance purposes. In both magnetic tape and solid-state modules, however, the memory medium is vulnerable to damage from fluids, fire and impact.

Transport Canada recently incorporated in the *Locomotive Inspection and Safety Rules,* the U.S. Federal Railroad Administration (FRA) 'aviation-equivalent' criteria for the survivability of data recorders. These rules now require that all new locomotives be equipped with an event recorder that meets survivability standards and records sufficient, useful parameters for recreating events prior to and, if possible, after an accident or incident. As part of a phased-in approach, existing locomotives will be required to have crashworthy event recorders on the lead locomotive.

The Transportation Safety Board (TSB) has expressed reservations about using existing aviation mode survivability standards in the railway environment. Although it is encouraged by almost all of the other improvements, the TSB still raises concerns about the survivability of the memory when involved in a fire. Aviation crashes typically involve intense heat for short durations, whereas railway accidents may involve fires of much longer duration.

> A requirement to ensure survivability and require voice recording on locomotives would enhance TSB's ability to investigate and bring more safety deficiencies to light.
>
> W. Tadros, Chair of the TSB, Remarks to the *Railway Safety Act* Review, April 2007

Although event recorders must be manufactured to meet the new Canadian and U.S. requirements, thus providing for significantly enhanced survivability in a fire situation, the recorders are only required to remain intact for a period of 60 minutes. The TSB is concerned that this is not a long enough period and that, in such situations, even the data on new recorders may be lost.

Following an investigation of a VIA Rail occurrence in January 1999 near Kingston, Ontario, the TSB recommended in July 2003 that Transport Canada and the railway industry develop comprehensive national standards for locomotive event recorders and that those include "a requirement for an on-board cab voice recording interfaced with on-board communications systems."[9] In its response, Transport Canada indicated partial acceptance of the recommendation, and initiated a project to provide advice on the establishment of standards. To our knowledge, there are no provisions for voice recorders in Canada other than in the aviation mode.

The Panel believes that the use of voice data can make an important contribution to the determination of causes and contributing factors to accidents and incidents by providing insight into the conduct and capacity of the locomotive crew.

RECOMMENDATION 44

Transport Canada should require the application of voice recorders on all new and existing locomotives, with survivability provisions similar to those for locomotive event recorders.

9.3 RAIL TRAFFIC CONTROL

Rail traffic controllers (RTCs) supervise all train movements throughout the Canadian railway system, over numerous main tracks and for the various railway companies. Different control systems governing train movements are used. Centralized traffic control governs train movements on signalled track. On non-signalled tracks, often referred to as "dark territory," RTCs are responsible for the safe and efficient movement of various types of trains, including freight trains, passenger trains and commuter trains, along with many of the tourist trains that operate throughout the Canadian system.

The primary responsibility of the RTC is to ensure the safety of trains and personnel on or near the tracks, including both railway workers and the general public.

A rail traffic controller is required to maintain a specified level of medical fitness, and this position is designated, therefore, as a railway safety critical position by the *Rules Governing Safety Critical Positions.* These rules require RTCs to submit to extensive medical exams prior to being appointed. They must maintain this level of medical fitness and be subject to periodic medical exams.[10]

[9] Transportation Safety Board, Railway Investigation Report R99T0017, Train Passed a Signal Indicating Stop, VIA Rail Canada Inc., Kingston Subdivision, Trenton, Ontario, 19 January 1999 (July 29, 2003), Recommendation R03-02, page 30.

[10] Also, RTCs must achieve a 90 per cent passing grade on their final operational and rules qualification exam. This is the only front-line position required to obtain such a high mark.

RAIL TRAFFIC CONTROLLERS:

- Control and route passenger and commuter trains safely and expeditiously to maintain their scheduled performance;
- Control and route freight trains on their railways which can include passenger-carrying tourist railways;
- Control and route special trains and tourist trains while intermixed with freight trains;
- Communicate and plan with other rail traffic controllers on adjacent territories and control centre locations for trains passing from one territory to another;
- Maintain and plan safe access track times for track maintenance work or inspections of signals and turnouts;
- Authorize train movement by way of train orders for reduced track speeds, planned train meets and train bypassing etc.;
- Advise train crews of improper track conditions, defective crossings and, when notified, provide advance notice to train crews of obstacles on the tracks, such as abandoned vehicles, trespassers, high water conditions, and fires;
- Coordinate and plan with emergency response personnel, such as police officers and firefighters when required to deal with emergency situations, train derailments and crossing accidents.

Currently, Transport Canada, Rail Safety Directorate conducts audits of all the rail traffic control centres in Canada for compliance with the operating and medical rules that are applicable. Given that all RTC centres are physically located in Canada, railway safety inspector powers provided under the *Railway Safety Act* (RSA) remain in full force, ensuring access to all information related to this safety-critical rail operation. New technology has made it feasible to centralize RTC locations, or to locate their operations outside Canada. This would limit the ability of Transport Canada, Rail Safety Directorate to fulfill its oversight obligations under the RSA. The Panel recognizes the important role that the RTC position plays in railway safety and the importance of keeping the compliance monitoring of this position within Canada.

RECOMMENDATION 45

The Government of Canada should ensure that rail traffic control in respect of operations in Canada be physically located in Canada in order to ensure appropriate regulatory oversight.

9.4 ENGINEERING

The Panel is aware that some clarity concerns have been raised pertaining to specific engineering sections in the RSA. For example, under section 11 of the RSA, all "engineering work" concerning rail infrastructure must be done in accordance with "sound engineering principles." Neither of these terms, however, is defined in the RSA, which some have asserted may lead to problems with interpretations, resulting in unclear expectations and making enforcement difficult. The Panel understands that these phrases lack clear definition, but believes it is important that they remain as a baseline in the Act and be complemented by rules and regulations that provide for clarity in terms of their application.

In addition, regulations have not addressed all of the main components of railway works. There are currently no regulations respecting the construction, repair, inspection or maintenance of bridges.

RECOMMENDATION 46

The reference to "sound engineering principles" in section 11 of the *Railway Safety Act* should be maintained and, where appropriate, specific standards or rules for construction, alteration and maintenance of a railway work should be developed.

Section 11 of the RSA requires that all engineering work related to railway works (design, construction, evaluation or alteration) be done "in accordance with sound engineering principles" and that a professional engineer must be responsible for the work. There is no mandated general duty of care, however, with respect to maintenance of works, which requires the ongoing repair, inspection and maintenance to also be conducted under the responsibility of a professional engineer.

Regulations respecting the maintenance of a railway work should be established, where appropriate. These regulations could include engineering standards that clarify maintenance requirements throughout the life span of the railway work.

As set out in the *Railway Safety Management System Regulations*, SMS plans are required to outline the processes and manner in which a railway company will provide for compliance with the RSA and the rules and regulations that are developed under its authority. The *SMS Regulations* require that a railway company submit an SMS plan and annual updates. Such plans should include how a railway company will ensure that its engineering maintenance programs are designed and implemented in accordance with sound engineering principles.

RECOMMENDATION 47

A general duty of maintenance of a railway work, in accordance with "sound engineering principles," should be included in the *Railway Safety Act*. The railway company's SMS plan should demonstrate how that company ensures that its maintenance conforms with "sound engineering principles."

9.5 TRAINING FOR OPERATING CREWS

The Panel heard from a number of presenters that the quality of the current training in place to educate and qualify locomotive crews has declined over a number of years and that some crew members are not as qualified as they need to be to take charge of a train.

The *Railway Employee Qualification Standards Regulation* has been in effect since March 16, 1987. Although the regulation has not been updated since it was implemented, it contains provisions to ensure that the training and certification of locomotive crews are being maintained at a significantly high level. The regulation specifies not only the operating crew positions that must meet the requirements of the regulations, but also criteria to be met by each candidate along with the passing grade that must be achieved. The positions specified are locomotive engineer, conductor, and hostler, or yard person.

The *Railway Employee Qualification Standards Regulation* also outlines the requirements for an instructor responsible for training and certifying candidates for a position specified in the regulations. It specifies that a training program must be filed with Transport Canada, Rail Safety Directorate, along with any changes or alterations to the program. The training and qualification programs can differ from railway company to railway company, and have been evolving to meet the needs of the industry.

The Panel learned that Canadian railway companies administer and update their training programs on an ongoing basis. Instruction in, and testing on the rules is conducted and the re-qualification of employees occurs continually. On some railways, new operators are assigned mentors who are responsible to coach newly qualified operating crew on the interpretation and application of rules. Even though the regulation itself has not been updated to reflect the current nomenclature, training and certification programs administered throughout the industry have been updated. Transport Canada monitors these training programs and, through audits, ensures that a crew member has the appropriate qualifications to fulfill the duties of the position.

In the United States, the FRA certifies all locomotive crews. As well, the Department of Transportation in the U.S. certifies all aviation and marine crew members. In

Canada, Transport Canada also certifies all aviation and marine crew members, but there are no provisions for Transport Canada certification of railway operating employees.

Transport Canada, Rail Safety Directorate has programs in place to address the qualifications of locomotive crews and rail traffic control positions. Nonetheless, there is a perception that because sole responsibility for certification of the candidates rests with the industry, there may not be sufficient objectivity. While consideration was given to recommending alternative approaches to the certification of the running trades, we understand that the current regulation will be superseded by new training rules and that these rules will address this issue.

9.6 TRAIN DYNAMICS

Several aspects of train dynamics were brought to the Panel's attention as having safety implications. These included train marshalling, distributed power, and dynamic brakes. We had discussions with the railway companies and, coupled with our independent research, we learned how these issues are being and should be managed.

Train marshalling is a term used to describe the placement or location of the cars in a train. The safety aspects of marshalling were brought to the attention of the Panel by the TSB[11] and were raised in some presentations to the Panel as part of the public consultations. Improper train marshalling can escalate even minor component failures, such as brake valve malfunctions triggering an emergency brake application, into serious derailments. Trains can typically be marshalled one of two ways – "marshalling for train dynamics" or "destination marshalling."

CP Alyth Yard, Calgary, Alberta, April 2007

[11] Wendy A. Tadros, Chair, Transportation Safety Board of Canada, *Opening Remarks to the Railway Safety Act Review Panel* (April 2, 2007).

Marshalling for train dynamics involves a structured approach to reduce in-train forces. Marshalling a train for improved train dynamics is accomplished by placing the loaded cars or heavier cars towards the head end of the train, and the empty or lighter cars towards the tail end, regardless of destination. This type of marshalling can dramatically reduce negative in-train dynamic forces that can be generated, for example, from an emergency brake application. Excessive forces can be generated as the heavier cars brake at a slower rate than the lighter cars. If the heavier cars are placed behind the lighter cars, a "run-in" occurs, which can result in an excessive build-up of longitudinal forces. If the build-up of forces is sufficient, it can lead to a derailment.

Also, marshalling for train dynamics reduces in-train forces for trains operating over territory with steep grades and sharp curves, thus lowering the risk of derailment. It reduces a build-up of lateral forces in a curve, for example, which can have the tendency to straighten the train ("stringlining") and cause a derailment. Stringlining was a contributing factor in the derailment and spill of a dangerous commodity into the Cheakamus River in British Columbia.

Destination marshalling groups cars together in blocks that are destined for the same location and eases the workload of en route switching activity required along the train route. Destination marshalling involves a reduced crew workload, fewer train delays and greater cost savings, while minimizing handling of cars. It is the marshalling method most often used in the industry today. As a simple example, a train departing Toronto can be marshalled with cars destined for Sudbury first in line, Thunder Bay second in line, Winnipeg third in line and so on. The destination blocks of cars can easily be uncoupled from the train. Destination marshalling, however, can lead to a disproportional distribution of loaded cars at the tail end of the train and empty cars at the head end, which is counter to optimal train dynamics.

One method to offset any negative effects of a destination-marshalled train is the use of distributed power. This places some of the locomotives that are required to pull the train either in the middle of the train or at the tail end, pushing the train. These locomotives are controlled by a locomotive engineer at the head end of the train through a remote control system, which provides full access to the braking and power systems on every locomotive in the train. Distributed power is especially useful to move larger, heavier trains as it distributes the longitudinal in-train forces throughout the train rather than focussing them at one end.

Distributed power also results in better brake response times, reducing the build-up of run-in longitudinal forces. It is being used extensively in mountainous regions, where the grades and curvatures of track are the most severe, and where it can mitigate dangerous "stringlining" forces that can be created throughout a train.

Locomotive engineers can be provided with a computer-generated "tonnage profile" which highlights the placement of heavy and light cars in the train. The engineer can then use this information to adjust his train handling to help counteract the build-up of negative train forces.

Using software developed by the Association of American Railroads, CP simulated derailments to determine how train marshalling may have been a contributing factor in accidents, and followed this work by developing countermeasures. Building on this, CP developed its own software, naming it TrAM (Train Area Marshalling). TrAM helps to detect marshalling issues that would impact train dynamics. The concept is intended to assist in the building of trains at major marshalling yards and reduce the build-up of negative in-train forces, thus improving train dynamics. The locomotive engineer is provided with improved information about how the train is marshalled, which permits more informed train-handling techniques.

There have also been significant improvements to the airbrake valves in use today. Brake control valve malfunctions have been significantly reduced. The newer valves are much less likely to trigger an emergency brake application unless initiated by the locomotive engineer. Also, railway companies now have better testing methods to isolate and remove cars that are prone to this problem.

Airbrake valve manufacturers and the railway industry are testing new technologies, such as electronic/pneumatic braking systems, that will lead to even better and quicker brake applications throughout the train, along with significant reductions in undesired emergency brake applications. This decreases the likelihood of excessive in-train dynamic forces being generated.

Dynamic brakes, which use the locomotive traction motors to generate stopping power, are considered to be a vital component for train control, especially in mountainous terrain. Transport Canada, Rail Safety Directorate has ordered the use of dynamic brakes under certain conditions, as they provide additional braking and train control options for the locomotive engineer to assist with downhill operations.

The Panel is satisfied that the railway industry in Canada is actively engaged in improving train dynamics for safety purposes. Given that this is a purely operational issue, the Panel feels that the solution should come from the industry. Nonetheless, the issue is vital to the safe operation of trains in the mountainous regions of Canada, and should be monitored closely by Transport Canada, Rail Safety Directorate.

9.7 DRUG AND ALCOHOL TESTING

In Canada, there are no regulatory requirements for mandatory random drug and alcohol testing of railway employees in safety sensitive positions. Such requirements do exist in the U.S., however, and it has been suggested to the Panel that we should align with our neighbour on this question.

Railway companies generally test for drugs and alcohol in pre-employment and post-accident situations, as well as for reasonable cause. With the agreement of their employees, railway companies could also institute random testing for drug and alcohol for employees in safety critical positions, since being free of drug or alcohol intoxication can be considered a *bona fide* occupational requirement under the *Canadian Human Rights Act*. If random testing were implemented, the *Canadian Human Rights Act* would require railways to accommodate employees who were found to be alcohol or drug-dependent.[12]

Given that unions generally object to random testing for drugs and alcohol for privacy reasons (thus making it difficult for employers to institute testing), we were asked by some stakeholders to recommend that such testing be made mandatory by regulations under the *Railway Safety Act*. In effect, the Act (section 18 (1) (c) (iv)) does provide enabling powers to control the consumption of alcohol by employees in positions critical to the safe operation of railways, and to prohibit the consumption of alcohol and the use of drugs by these persons.

Given the human rights issues raised by instituting mandatory random drug and alcohol testing, the Panel considers that a convincing case has not been made for pursuing this suggestion.

Regulations providing for mandatory random testing for substances would infringe on rights protected under the *Canadian Charter of Rights and Freedoms*. Sections 7 (right to life, liberty and security of the person), 8 (right to be protected from unreasonable search or seizure) and 15 (equality rights) of the Charter could be invoked to challenge the regulations.

In the present state of science, random testing for drugs would likely not withstand a Charter challenge because of the absence of a correlation between testing positive for drugs and having been impaired while on duty. This explains why the *Railway Safety Act* allows for regulations for the control of alcohol consumption but not for the control of drug use.

While mandatory alcohol testing could not be met with the same objection, it is far from clear that it would withstand a Charter challenge. Once it is established that a regulation infringes on a Charter right, it is inoperative unless the government can establish that the infringement is justified under section 1 of the Charter. Many factors would make this demonstration difficult in the case of mandatory alcohol random testing. Companies already test for alcohol when there is reasonable cause or after an accident, so they are not without means of controlling alcohol abuse. Although statistics provided to the Panel would tend to indicate that substance abuse

[12] Canadian Human Rights Commission, *Draft Policy on Drug and Alcohol Testing* (June 2007), pages 1-2.

is more prevalent in Canada than in the U.S., at present, there is no evidence that substance use is more of a factor in railway accidents in Canada than in the U.S.

The Panel also notes that there is no consensus in the industry in favour of government-imposed random alcohol testing. Unions are against the measure and, while the Railway Association of Canada is recommending it, the Panel's meetings with individual companies would indicate that there is not wide consensus on the issue.

For the preceding reasons, the Panel is not prepared to recommend that mandatory random drug and alcohol testing be instituted by way of regulations under the *Railway Safety Act*. Considering the importance of controlling substance abuse by persons employed in positions critical to the safe operation of railways, however, the Panel strongly encourages employers and employees to continue to work together on the establishment or enhancement of programs to deal with drug and/or alcohol dependence.

CHAPTER 10

SCIENTIFIC AND TECHNOLOGICAL INNOVATION

Science and technology have been used extensively throughout the railway industry to improve operating conditions and advance the safety of Canadian railways. Innovations have permitted longer trains and led to improved rail cars that are not only easier to load and unload, but also more crash-worthy. Innovations have also led to improved freight car truck assemblies, which have permitted increased train speeds, and to the development of a new dangerous goods tank car design that improves derailment survivability. On the track side, innovations have significantly improved wayside scanning and track inspection and rail flaw detection. The easy transfer of containers from one transportation mode to another has been facilitated by the use of new rail car technology, container cranes and modern container terminals.

Rail Flaw Detection Vehicle (CN Symington Yard), Winnipeg, Manitoba, June 2007

10.1 NEW TECHNOLOGIES – RESEARCH AND DEVELOPMENT

Main track derailments are generally associated with track and equipment failures. Between 1999 and 2006, over 60 per cent of main track derailments reported to the TSB were attributed to either track or equipment failures. Further, if consideration is given only to those derailments where a contributing factor is cited (excluding the 29 per cent where a cause was not assigned), equipment and track deficiencies account for 89 per cent of all main track derailments.[1]

[1] G.W. English and T.W. Moynihan, TranSys Research Ltd., *Causes of Accidents and Mitigation Strategies* (July 2007), section 2.2.1.

As a result of these statistics, there have been significant technological advancements related to track and equipment safety issues, many of which are newly emerging. The Canadian railway industry has been adopting various types of technologies that have been developed to specifically target equipment and track-related derailment causes.

In its presentation to the Panel, CN noted that "...virtually every aspect of railway industry operations has experienced significant technological improvement in the 13 years since the last *Railway Safety Act* Review."[2] CN has invested significant effort in developing and implementing new technologies with a view to improving safety and is committed to continuing these efforts. Examples of new technologies being used by CN include ultrasonic rail flaw detectors, track geometry cars, slide detection/roadbed stability detection, hot bearing detectors, wheel impact load detectors, and locomotive control systems – to name only a few.

To illustrate the technological change that has taken place, in 1994, CN had about 250 hot bearing detectors spaced approximately every 25 miles along its track. The information from detectors was sent to a dispatching centre where an analyst would check it and call for the train to be stopped if necessary. That network has expanded to 683 hot bearing detectors with spacing of 12-15 miles over the core network. These devices have been augmented with strategically placed derailment detectors. Detectors are linked to a central computer to allow for pre-emptive maintenance. Immediate information can also be provided to train crews for their action.

CP also recognizes the importance of research and development and the role that new technologies play in advancing safety. In its submission to the Panel, CP stated that "technology initiatives also form an important component of CP's drive for increased safety in its operations."[3] CP has been using technologies such as rail grinding and testing, wheel impact load detectors and technology-driven maintenance inspections – to name just a few. Along with others in the railway industry, CP is testing other technologies, such as electronically controlled pneumatic brakes.

[2] CN, "Integrated Safety Plan - Technology," *Submission to the Railway Safety Act Review Panel* (May 2007), page 1.

[3] Canadian Pacific Railway Company, "Safety Demands Continuous Improvement," *Opening Submission* (April 2007), page 12.

TECHNOLOGIES BEING USED BY RAILWAY COMPANIES

EQUIPMENT IMPROVEMENTS:

- Wheel profile monitoring, using digital imaging;
- On-board sensors (Smart Car concept) linked electronically to satellites and web-based databases;
- Track side acoustic bearing failure detectors;
- Track and truck mounted performance detectors;
- Wheel tread conditioning brake shoe, which removes a small portion of the wheel tread with each brake application;
- New generation tank car, which incorporates new tank and car crashworthiness construction.

TRACK-RELATED IMPROVEMENTS:

- Real-time track performance evaluation;
- Clean steel initiative;
- Rail grinding for track re-profiling;
- Rail lubrication in curves;
- More focussed and targeted rail replacement programs;
- Wheel impact load detectors;
- Elastic track fasteners.

OVERALL TRAIN OPERATIONS AND REDUCED ACCIDENT FREQUENCY:

- Positive train control, which electronically ensures correct spacing between trains travelling in the same direction on the same track;
- Switch position indicators that can alert an oncoming train to a misaligned switch.

As mentioned in Chapter 9, CP mitigates the negative effects that train marshalling can have on in-train forces. CP developed TrAM software to easily permit data on the train consist[4] to be entered into the program. This allows for potential trouble areas to be highlighted so that corrective action can be taken. With this up-to-date information, the locomotive engineer can either adjust the train make-up or adjust handling techniques to compensate for potential trouble spots. It is clear that CP is supportive of enabling the use of technologies to improve railway safety.

The Panel learned, however, that short line railways may have difficulty implementing technological innovations due to a lack of financial capital. Nonetheless, innovations developed and implemented on a system-wide basis are available for all railways to use. For example, short line railways receive benefits from freight car innovations because they are often the end users of Class 1 railway equipment and operate over Class 1 territory.

The Panel is confident that the railways are investing responsibly to develop new technologies for track and equipment and that these have, and will continue to have, a positive impact on safety.

[4] In this context, "train consist" refers to the list of locomotive units or cars in the train. It can also refer to the make-up of the train, with respect to car types.

10.2 THE ROLE OF GOVERNMENT

In considering the impacts of technological advancements on railway safety, the Panel recognized that the government has an important role to play, primarily in creating an environment that is conducive to developing and implementing new technologies. It is crucial to support the ongoing efforts by railway companies in many different areas because they will lead to significant safety improvements.

With respect to railway crossings, for example, Transportation Safety Board (TSB) data shows that railway-crossing accidents have been exhibiting a downward trend since 1989. In 1989, there were 469 crossing and trespasser accidents reported to the TSB, which dropped to 248 reported accidents in 2006.

Separating the grade of these crossings would undeniably be the best way to reduce this accident rate further; however, given the vast number of crossings and the sparseness of the population surrounding the majority of them, building a grade separation is not, generally, economically feasible. Nonetheless, a number of crossing innovations and new technologies have contributed to reducing the accident rate and some of these are less expensive solutions.

In 2002, a human factors analysis of highway-railway grade crossing accidents in Canada carried out by Cognitive Ergonomics Research Laboratory[5] (*Caird Report*) found that a number of accidents had more than one action or factor associated with them (i.e., multiple contributors). This provided the opportunity for more detailed consideration of how driver behaviour interacts with various conditions to cause an accident.

Transportation Safety Board information pertaining to railway crossing accidents suggests that "driver unsafe" acts (which have the potential to be reduced through technology) may have been directly responsible for some of the reported accidents.

Median barriers and four quadrant gates are two examples that restrict "driver unsafe" acts. The TSB data for January 1999 to July 2007 revealed that many of the same actions and issues predominate. The most common unsafe acts were:

- Intentionally driving around the gate;
- Driving through the gate;
- Skidding onto the track;
- Stopping, then proceeding.

[5] Jeff Caird, Cognitive Ergonomics Research Laboratory, *A human factors analysis of highway-railway grade crossing accidents in Canada* (2002).

Summaries of 86 accidents were reviewed in the *Caird Report*. This review revealed that an intentional action by the vehicle operator was a contributing factor in each of the accidents. Some of these intentional actions included driving around the gates, attempting to beat the train, slowing then proceeding, alcohol impairment and fatigue. Other factors included driver distraction, failing to see the train or signals, cellphone use and other distractions, such as adjusting a radio or tape player.

It has been brought to our attention that crossing safety can be significantly advanced with the use of moderately priced scientific innovation or technology to mitigate accidents where intentional action is a contributing factor. For example, centre line concrete medians, in conjunction with crossing gates or four-quadrant gates, can provide significant barriers to prohibit vehicles from driving around gates, or stopping and then proceeding.

Given that drivers frequently disregard stop signs in open areas with clear sightlines, the *Caird Report* also revealed that the effectiveness of stop signs in reducing railway crossing accidents had not been established.[6] Depending on circumstances, other technologies could be implemented at some locations and crossing safety improvements would be immediate. Examples of these technologies include:

- converting passive crossings to active crossings by using flashing lights, bells and gates;
- upgrading flashing lights and gates with other countermeasures, such as photo-enforcement, median barriers, and four quadrant gates; and
- installing supplementary advance warning signs that indicate what drivers should do (e.g., "look for trains" and "do not stop on tracks") as they approach a crossing.

> Technology alone rarely accounts for an improvement in safety performance. To ensure that quality assurance is in place and that we are realizing the full benefits, every new technological advance at CN is linked with the necessary training, procedures, supervision, monitoring and analysis. In other words, we ensure that the other two elements of the CN Integrated Safety Plan – people and process – support technology.
>
> CN Submission, *Integrated Safety Plan - Technology*, pages 2-3.

As mentioned, the railway companies appear to be investing significantly in new technologies aimed at improving the safety of their operations. The Panel feels that there is also a need to increase focus on scientific and technological advancements that would improve crossing safety. Transport Canada has the opportunity to be a leader in this area. While scientific research in human

[6] See also Neil D. Lerner, Robert E. Llaneras, Hugh W. McGee and Donald E. Stephens, *Traffic-Control Devices for Passive Railroad-Highway Grade Crossings*, NCHRP Report 470, Transportation Research Board-U.S. National Research Council (2002), a study of the use and effectiveness of traffic control signs at passive crossings in the U.S.

factors and technology is important, efforts to improve crossing safety must be undertaken in conjunction with effective public outreach programs, such as Operation Lifesaver.

RECOMMENDATION 48

Transport Canada should take a leadership role in any and all technological and scientific advances that would improve public safety.

Even though the railway industry has a significant impact on the Canadian economy, there are limited public resources available to initiate research and development (R&D) that could improve railway safety.

Technology designed to affect safety issues in the U.S. can lead to improving the overall rail safety picture in both Canada and the U.S. The Panel learned that technological advancements are widely shared because of the inter-relatedness of rail networks across North America.

It is of interest that the U.S. Federal Railroad Administration (FRA) has an annual R&D budget of US$35 million and provides funding to the Association of American Railroads (whose annual R&D budget is US$13.5 million). In Canada, Transport Canada's Transportation Development Centre is responsible for developing R&D projects aimed at improving Canada's evolving transportation system through enhancing knowledge in railway safety and researching technological innovation. In 2006-2007, the Transportation Development Centre's R&D funding for the rail mode was $460,000, which represents 10 per cent of the overall $4.6 million R&D budget for modal and program areas within Transport Canada. This is considerably lower than the funding provided in the U.S.[7]

The Panel was also made aware of the Transportation Technology Center (TTC)[8] in Pueblo, Colorado, and at least one Canadian railway company mentioned that it was "...doing a good job looking at new technologies."[9] The Center is a 52-square-mile facility and includes laboratories and 48 miles of test tracks. This facility allows for testing of locomotives, cars, track structures and various components for freight, passenger, transit and high-speed rail operations. Apart from the FRA, other government agencies, the railroad industry, individual railroads, transit operators and suppliers have all utilized these testing facilities. The TTC's aim is to focus on technologies that will enhance railroad safety, reliability and productivity. The

[7] Transport Canada, Transportation Development Centre *Annual Review 2006-07*.

[8] The TTC is operated by the Transportation Technology Centre Inc. (TTCI) through a contractual arrangement with the FRA. TTCI is a wholly owned subsidiary of the AAR.

[9] Information provided by CP during a meeting with the *Railway Safety Act* Review Panel (August 9, 2007).

Center also has facilities for training emergency personnel in response procedures for accidents involving hazardous materials.

The ability to influence the direction of the U.S. Transportation Technology Center's R&D program, however, is proportional to the amount of money expended by contributors. As a result of minimal federal funding in this area, it is difficult for Canada to influence the development of new technologies to enhance safety issues specific to the Canadian operating environment.

RECOMMENDATION 49

In view of the importance of railways to the Canadian economy, the Government should strengthen its contribution to innovation and technological advancements in railway safety.

Once new technologies have been developed and tested, commercially viable options may require regulatory change. In its submission to the Panel, CN notes that "a significant number of old regulations and orders that pre-date the RSA have led to delays and frustration in implementing improved safety technology."[10] Further, attempts by railway companies to implement new technologies can be delayed or result in additional costs because of the need to obtain regulatory exemptions to outdated provisions. We recognized this concern and have made a recommendation in Chapter 4 to address the issue of obsolete regulations or rules.

THE TRANSPORTATION DEVELOPMENT CENTRE NOTED THE FOLLOWING:

Detailed engineering/operational specifications imbedded in regulations are generally viewed as tending to stifle innovation. This is based mainly on past worldwide experience that shows regulatory change to be usually a slow process.... The preference for ...performance approaches appear[s] to be based on the perception that [this] will facilitate technological and operational changes desired by the railways while at the same time ensuring that government safety objectives will be met in a timely manner.

TDC, *Use of Performance Standards In Railway Safety Regulation,* page 3.

The Panel has concluded that the *Railway Safety Act* (RSA) is not an impediment to the adoption of new technologies to improve safety as the Act allows safety regulations and rules to be updated to reflect new technology. Section 22 of the Act also provides for an exemption to rules and regulations developed under its authority, so that the implementation of new technology can be facilitated.

Even though the RSA is not seen as a direct impediment to the adoption of new technologies, the shift to performance-based regulations and standards has not advanced quickly enough. Performance-based

[10] CN, "Integrated Safety Plan - Technology," op. cit., page 10

regulations and rules (as opposed to prescriptive ones) are conducive to the implementation of technological advances.

To be fully effective, performance-based rules and regulations must clearly define the nature of required performance. They leave room, however, for many different options to attain the specified performance. Performance-based rules and regulations should facilitate the implementation of new technologies.

To illustrate why this is so important, we cite the example of the *Canadian Railway Track Safety Rules*, first issued in 1992 when both CN and CP had very different operating environments. At that time, each company was utilizing track maintenance standards that suited its specific needs. Developing an agreed upon "safety minimum" standard to be incorporated into a Canadian industry-wide set of rules became very difficult to achieve. CN and CP were compelled to keep their own standards and best practices. Without agreement by the railway companies, Transport Canada, Rail Safety Directorate developed a rule that was based on a U.S. equivalent, which resulted in prescriptive rules and criteria.

Through their use, the industry has found that the majority of the criteria pertaining to defects defined under the *Track Safety Rules* are not considered to represent a hazardous condition.[11] Since they are listed in the rules, however, Transport Canada requires railway companies to maintain the track to this specified level and enforces compliance. If the Canadian *Track Safety Rules* were based on minimum performance standards, they would encourage the development of new technologies to meet or exceed these standards, rather than the current requirement to comply with criteria pertaining to specific defects.

> CP views the current regulatory framework as limiting and certainly not encouraging Transport Canada's ability to work cooperatively with railways on newer, better, and creative approaches to railway safety. Coupled with this limitation is the current lack of resources devoted to safety-oriented research and development by Transport Canada. An expansion or amendment of Transport Canada's mandate would be required to allow effective participation by the federal government in safety research and development.
>
> CP Submission, *Safety Demands Continuous Improvement*, page 15.

In the U.S., the Panel heard that the FRA and the Association of American Railroads (AAR) are both proactive in pursuing technological innovations. The Panel also heard from Canadian railway companies that the attitude in the U.S. towards innovation and technology is one that encourages their use. The U.S. considers this to be critical for safety. The Panel heard that this attitude is not always evident in Canada.

[11] See T.W. Moynihan and G.W. English, Research and Traffic Group, *Railway Safety Technologies* (July 2007), section 2.2.3: "Railways need minimum safety standards, to safeguard interchanged equipment and to preserve the public image/confidence in the industry. However, only an estimated 20% of existing defined defects under the Track Safety Rules are considered to represent a hazardous condition."

Industry expressed the view that the regulator's current attitude towards research and development, its lagging recognition of the advantages of new technologies, and a lack of meaningful funding are barriers to making progress with respect to safety. We heard that the industry is more than willing to dedicate additional funds to research and development but that such additional funding must be accompanied by a shift in the regulator's stance, both with respect to regulatory incentives and the capacity to assess and facilitate the implementation of new technologies.

The newly developed electronic braking system is one example of technology that would provide a significant benefit to Canadian railways and the industry as a whole. This system can result in brakes being simultaneously applied on all train cars, and reduces the build-up of negative train forces that can lead to equipment damage and, in extreme cases, to derailments. It can also improve train handling and result in less equipment and product damage, improved cold weather braking, and a safer operating environment. It is faster and more reliable than the current pneumatic system, which can be negatively affected by the cold temperatures experienced in Canadian winters. Given that all freight cars operating in North America must be standardized to facilitate the simple interchange from one country or railway to another, such a redesign would require that every car be similarly equipped. This comes at a significant cost.

Not only does the U.S. devote considerable funding to research, it has also implemented regulatory incentives on the issue of electronic braking. The FRA has developed a separate set of brake-testing rules that apply specifically to the use of electronic braking systems and work in conjunction with the rules in place for pneumatic braking systems. These rules provide relief from en route brake tests that are currently required for pneumatic brake systems. Eliminating this en route test can directly lower train inspection costs and reduce train delays. Given their stance on funding and regulatory incentives, U.S. railways are in a better position to adopt this advanced technology.

The electronic braking system is only one example that could provide benefits to the Canadian operating environment. There are many other technologies and innovations that provide widespread improvements to railway safety and some of these innovations are discussed later in this chapter. Given the significant impact that the railway industry has on the Canadian economy and the importance of safety, current funding and regulatory incentive programs for research and development of new technologies appear to us to be disproportionately low.

The facilitation of technology development involves human and financial resources that the Panel feels are lacking in the Transport Canada, Rail Safety Directorate. If Transport Canada wishes to have an influence on technology related to safety

issues, especially those pertinent to the Canadian operating environment, it must invest in both people and research.

RECOMMENDATION 50

Transport Canada should increase its capacity to assess new technologies, and facilitate their implementation.

Generally, the private sector initiates research independently. Given that the potential market is much larger in the U.S., however, suppliers undertaking research and development do so with that market in mind. A product designed to work well in warmer weather will have a larger market in the U.S. and Mexico. It may be difficult for the same product to operate safely throughout its service life in the Canadian climate.

As an example, the steel used in the manufacture of freight car wheels and the rail used in the track are more prone to brittle failures in Canada's colder temperatures. Even though there are areas where weather may be a factor in the U.S., winters are generally milder and there are fewer track failures because of cold temperatures. Given that it is not as pressing a safety issue in the U.S., it is difficult to garner support for it to be a high priority in terms of overall safety priorities.

Both CN and CP invest in research and development. However, given the specifics of their operations, they tend to focus on those research and development projects that target their own urgent safety issues, rather than those that may benefit the entire railway industry in Canada. We see this as a role for the regulator and believe that efforts should be aimed at meeting the unique needs of the Canadian operating environment.

RECOMMENDATION 51

Transport Canada and industry should jointly fund scientific and technological innovation to address rail safety issues that are specific to the Canadian operating environment.

10.3 HUMAN-TECHNOLOGY INTERFACE

With respect to the design of locomotive control stands and panels, our research indicated that design standards of these components have not kept pace with conventional standards of human factors engineering. Such standards explicitly recognize that human error does occur and require that systems be designed with such a possibility in mind. Design principles should be based on an understanding of causes of errors, and solutions should be developed to minimize the likelihood of their recurring.

There are many examples of occurrences where equipment design has contributed to an accident. Some of the issues identified have included the placement and layout of communications equipment in the locomotive cab. One example was outlined in the TSB report on the investigation into a freight train derailment at Carlstadt, Ontario in October 2003. The report stated that the locomotive engineer inadvertently tuned the locomotive radio to the incorrect channel. The location of the radio in the locomotive likely contributed to the selection of the incorrect channel. The TSB recognized that locating controls where they are difficult to operate can increase the probability of error.

It should be noted that, in the U.S., the FRA has developed human factors guidelines specifically for application in locomotives.[12] The FRA recognizes that locomotive controls can be manufactured to reduce errors. This includes placing controls within the engineer's reach and designing alarms to provide immediate operator feedback. The Panel encourages consideration of these guidelines as they have the potential to improve operating conditions in locomotives.

The Panel concludes that future locomotive equipment must consider the operator from the earliest design stages. The operator must be the focus and design specifications must take account of human capabilities and limitations in locomotive design. Good technological design must allow people to concentrate on performance. By incorporating human performance and behaviour principles into the locomotive design, it will be possible to improve safety while enhancing performance.

RECOMMENDATION 52

New locomotives should be designed to conform with acceptable standards of human factors engineering. Corrective strategies should also be developed to minimize any negative impact on safety resulting from poor design of existing locomotives.

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[12] U.S. Federal Railroad Administration, *Human Factors Guidelines for Locomotive Cabs* DOT/FRA/ORD-98/03 (November 1998).

CHAPTER 11
RESOURCES

Changes in the railway industry structure, the implementation of a new regulatory framework and the current economic environment have put pressures on the financial and human resources dedicated to managing rail safety. These pressures will increase with the projected growth in the railway industry. The Panel's recommendations for improvements impose additional resource requirements that must be addressed if Canada's railway safety regime is going to realize the intended benefits.

11.1 RAILWAY COMPANIES

Many factors can affect a railway company's safety performance. Among the most important are recruitment and retention of employees, their training, their reporting culture, and financial investment.

11.1.1 Recruitment and Retention

The number of qualified employees and their demographics will likely raise safety-related challenges in the future. Over the past several years, employment in the rail sector has declined significantly, in part because of the adoption of new technologies, from more than 67,000 employees in 1990 to about 35,000 in 2005, representing an average 4.3 per cent decrease per year.[1] Because the industry curtailed hiring in the 1980s, the age demographic of the North American railway workforce is now slanted towards older workers, many of whom are approaching retirement. Furthermore, the Panel heard that potential applicants are dissuaded by the difficulty of the work, the challenging work conditions and frequent, sometimes extended, absences from home.

> Another common (but not universal) view was that companies are operating with fewer and fewer employees and that those employees are being pushed hard in all areas of railway operation.
>
> Sussex Circle, *Governance*, section 4.

Throughout the course of the Review, the Panel repeatedly heard concerns that new technologies were replacing workers and that, where safety is concerned, technology is not always a substitute for people. The Panel believes that the introduction of new technologies that make operations safer should be complementary to a railway company's well-qualified workforce. Nonetheless, the possibility always exists that the introduction of certain technologies will result in some reduction in the workforce.

[1] Transport Canada, *Transportation in Canada 2006, Annual Report* (May 2007), page 49.

The staffing of trains has already become a problem because of a shortage of employees. Having fewer employees in critical positions is creating an additional set of challenges. We heard of several instances in which this situation is causing employees and supervisors to work longer hours with less rest and less time off. In turn, this can lead to fatigue and reduce alertness, which increases the risk of accidents.

If not addressed, the shortages will be exacerbated by an increase in absenteeism and in the rate of departures. The Panel has been advised that railway companies are making concerted efforts to address this matter.

11.1.2 Training

Recruitment and retention challenges could bring pressure to rush employees through necessary training. The Panel heard of situations where supervisors or managers were operating trains or performing switching functions because of staff shortages, or being used as replacement workers during strikes. We are concerned that if replacement workers with limited operational background or current experience have not received sufficient training, it could present a safety risk.

> The very limited experience and training that these replacement workers had was a very real concern to the locomotive engineers that were required to work with them.
>
> Brian Martin Submission.

Since the railway industry is responsible for its own training and the certification of running trades, there is a perception that the industry may not be entirely objective and that there is insufficient oversight and monitoring of training by government. While consideration was given to recommending alternative approaches to the delivery of training and the certification of the running trades, we are aware that the current initiative to develop rules for training, being discussed by the Railway Association of Canada and Transport Canada, is intended to address this issue.

11.1.3 Reporting Culture

Conceptually, the implementation of an effective safety management system (SMS) not only improves safety in a railway company's organization, but also provides economic benefits. The foundation for an effective SMS is a strong safety-conscious culture throughout the entire organization.

A significant number of railway accidents result from human decisions. These may be avoided in the future by having a better understanding of why certain decisions led to the accidents. Rather than promoting a culture that lays blame on employees for errors or failure, we strongly believe that railway companies need to create an environment in which employees can report incidents and accidents without fear of reprisal. This takes time and effort because it involves developing and implementing

initiatives that will contribute, over time, to the culture change required for an effective SMS.

The sustained effort that will be required over an extended period may require resources to be expended in training and educating managers and staff of railway companies on how to create a climate in which people feel comfortable reporting problems. The Panel observed that some railway companies are currently more advanced than others, but there will be a continued need to expend resources and develop commitment on the part of management and employees in all companies to achieve a blame-free reporting culture.

11.1.4 Investment

While many factors, such as longer and heavier trains, and improper train handling, may contribute to main track train derailments, wheel and rail failures are the two principal causes. Sufficient investment in infrastructure, proper maintenance and new technology are major measures to mitigate these failures. Both CN and CP, which operate about 75 per cent of the domestic network, are reinvesting in their main track infrastructure.

Concerns were expressed that since its privatization in 1995, CN has focussed on reducing costs and increasing productivity to the detriment of safety; however, the Panel saw no evidence that CN was not investing adequately in its main track infrastructure. In 2007, CN will invest approximately $1.6 billion in technological enhancements or improvements in rail infrastructure or equipment.[2]

Short line companies are generally faced with a different situation. Certain short line companies have limited financial ability to maintain and reinvest in track, bridges and rolling stock. However, when they operate over the track of CN and CP, the larger companies are responsible for their safety conditions. Because the majority of short line operations are providing feeder services to CN and CP and frequently operate over the larger companies' track, these larger companies monitor the short line operations. Although the Panel did not conduct a detailed financial review of short line companies, we found no safety issue as a result of insufficient investment by short line operators.

The Panel noted that the high number of non-main track accidents may indicate that more emphasis needs to be placed on investing in facilities that are not part of the main track and on addressing factors that lead to non-main track accidents.

[2] CN, "Safety – A CN Core Value, An Overview" *Opening Submission to the Railway Safety Act Review Panel* (April 2007), page 8.

11.2 TRANSPORT CANADA

The necessity for more resources dedicated to rail safety in Transport Canada was a theme that the Panel heard repeatedly and independently from many sources with a variety of interests. While no specific study was conducted for us on Transport Canada's resource requirements, the Panel was made aware of Transport Canada internal reviews that supported this finding, and we are convinced that this is a significant challenge that needs to be addressed.

Transport Canada is challenged to maintain and reinforce its capacity to oversee a modern railway safety system. For example, the increase in the number of short line railways and the shift to SMS has had an associated impact on workload for Transport Canada inspectors. This fact was noted in the Rail Safety Service Line Resource Review of 2005. It recognized that inspections and audits must be increased to cover all companies. It also noted that Transport Canada, Rail Safety staff often needs to invest a significant amount of time in assisting short line companies to better understand the regulations and take the necessary corrective actions to be compliant.

In addition, while minimal resources have been provided to assist with the development and implementation of the SMS framework, its integration into the broader rail safety program continues, as do the traditional inspection activities. This operating environment has been recognized as posing particular problems from a resource perspective. There is a need for Transport Canada to develop the capacity to provide effective oversight of SMS while maintaining appropriate inspection functions.

The Panel's view is that Transport Canada is inadequately resourced to carry out its many responsibilities in the area of railway safety. The problem is essentially one of inadequate financial and human resources compounded by the rapid loss of experienced people through retirement and other causes.

> Finally, lack of resources, both financial and human, to carry out the Transport Canada rail safety mandate was a matter of widespread concern within the department and elsewhere. There was a general sense that the ability of Transport Canada to create and manage an effective railway safety regime is limited by a shortage of the right people (and the financial resources to support them). Replacing those who are retiring and getting people with the right skills, experience and attitudes to deal effectively with new approaches such as safety management systems and risk management is seen as a critical and difficult challenge.[3]

[3] James Mitchell and Nigel Chippindale, Sussex Circle Inc., *The Governance of Railway Safety in Canada* (September 2007), section 4, "From the Federal Players."

In providing a strategic overview of the 1999 amendments to the *Railway Safety Act* (RSA), Transport Canada recognized the burden that these new authorities would place on the institutional capacity of its organization. It wrote:

> These new and enhanced functions will require new competencies, shifts in resource allocation and, potentially, additional resources. New competencies in statistical analysis and auditing will be required for program staff. However, traditional technical skills will continue to be important to ensure the credibility of the program in the eyes of industry. Resource shifts will be necessary at headquarters and in the regions in order to take on new functions and increase the emphasis on selected existing functions. Because Rail Safety staff are already stretched and no current activities are going to be entirely abandoned, at least in the short-term, it is expected that additional resources will be required.[4]

The Panel is convinced that these requirements for new and enhanced competencies and resources still exist. For example, Transport Canada, Rail Safety Directorate has introduced a risk-based business planning initiative to assist its staff in identifying, evaluating and developing risk control strategies for safety issues with regard to railway operations. This approach is being implemented nationally and is, by nature, resource-intensive, involving a combination of mitigation strategies such as enforcement, education, development of new rules or regulations, and focussed audits.

There will also be added pressure to take on the new responsibilities recommended in this report. Resources will be needed in order to consult widely and effectively, support the regulatory framework, enhance the data collection and analysis capacity, enhance public education programs, develop sufficient capacity and expertise in aspects of environmental protection, further contribute to improvement of grade crossings, contribute to research and development and work with the U.S. on harmonization matters.

11.2.1 Consultations

A rigorous, structured consultation mechanism is essential to making the RSA regulatory framework function effectively. A well-managed consultation process provides transparency and builds confidence among all the participants. The Railway Safety Consultative Committee, however, needs to be revived. We also feel that there is a need to enhance consultation with the provinces and that the Federal–Provincial Working Group on Railway Safety should be used more deliberately to share information. In order to support the ongoing consultation activities, a permanent secretariat should be funded and established in Transport Canada's Rail Safety Directorate.

[4] Transport Canada, *Railway Safety Program Strategic Overview* (2001), section 4, at www.tc.gc.ca/railway/RSSO/RSSO_e.htm.

11.2.2 Regulatory Framework

The RSA framework is built on a foundation of collaboration and, throughout the Review, the Panel observed how people and institutions are working together, how they communicate and what processes are used to make decisions. One area where there are issues to be resolved is the rule-making process. Both the Railway Association of Canada and Transport Canada, Rail Safety Directorate have stated that they work well together and are in general agreement on many issues, except for rule making.

The Panel firmly believes that Transport Canada, Rail Safety needs to participate actively in the rule-making process. In order to fulfill this role, the Rail Safety Directorate should develop and enhance its expertise in the legal aspects of rules and in the technical safety issues respecting individual topics covered by rules.

The introduction of performance-based *SMS Regulations* in 2001 necessitated a significant shift in the traditional roles and responsibilities of industry and Transport Canada. This shift requires a change from substantive testing to an audit-based approach in which audits will be carried out at the system level rather than the purely operational level. With this come new criteria for skills and capabilities.

In the Panel's opinion, Transport Canada, Rail Safety was not provided with sufficient human and financial resources and the appropriate skill sets at the outset of the SMS program. This impeded the transition to a regulatory oversight program that focuses on risk assessment and performance-based auditing at the safety management system level. The Rail Safety Directorate in Ottawa is responsible for SMS program development and has created a small unit to oversee the program. Program delivery is the responsibility of Transport Canada regional offices, and only two additional staff members were added to each regional office on a temporary basis when the SMS program was introduced, although use of these resources differs from region to region.

New resources and skills are required for Transport Canada to accelerate the transition from inspection to audit, ensure audits are performance-based, and collect and analyze the information required to monitor and/or audit performance. This point was underscored in a research study commissioned by the Panel, which summarized views expressed on the issue:

> The view was that rail safety is a complex and serious matter that requires substantive expertise and staffing for the long term. Moreover, the need is not just to find or train people to provide the traditional skills and knowledge of rail safety management; rather, new types of expertise are needed for the evidence-based, risk-management approach of a modern safety management system.[5]

[5] Mitchell and Chippindale, Sussex Circle, *Governance*, op. cit., section 5-C, "Issue 6."

The Panel also heard that Transport Canada should develop a better understanding of the short line operating environment, especially in the context of SMS implementation, to ensure effective delivery of services called for under its MOUs with provinces.

11.2.3 Information Collection, Analysis and Dissemination

Under the SMS framework, the regulatory oversight model requires a systems analysis of safety-related data and information. Transport Canada must focus on being a data-driven, analytical organization. It must be more proactive in identifying priorities and using analysis to drive policies, regulations and compliance activities.

Currently, the railway companies collect data for internal use and SMS reporting, the Transportation Safety Board (TSB) collects information on accidents and incidents for publication and Transport Canada collects data for regulatory oversight. The Panel heard from the major railways that they collect activity data to effectively manage their safety programs. As we outlined in Chapter 6, however, such information is not reported to or collected by Transport Canada and is, therefore, not being used as effectively as it could be for assessing the safety of the system.

In Chapter 6, we also outlined our concerns about the TSB data and how results are reported. The data may not provide an accurate representation of overall safety performance of the railways. Additionally, TSB accident reporting needs to be strengthened so that critical safety information is provided in a timely manner.

Transport Canada must work with the industry to assess the data required, enact the regulatory authority to collect it, and establish a system to analyze and disseminate it appropriately.

11.2.4 Public Outreach

Outreach programs such as Operation Lifesaver and Direction 2006, which are cooperative efforts among all levels of government, railway companies, public safety organizations, police, unions and community groups, have been successful in educating the public and promoting railway safety. However, more needs to be done. The government needs to limit the number of new crossings, increase funding for grade crossing improvements, and give consideration to the creation of grade separations, wherever feasible.

The Grade Crossing Improvement Program (GCIP), which provides grants of up to 80 per cent of the cost of improvements to railway safety at public crossings in Canada, has been successful. However, the Panel feels that the GCIP should apply to private crossings as well as public ones. We also heard that there is a backlog of planned crossing improvements and that more research is needed in this area. We support additional funding for safety improvements at federally regulated crossings.

11.2.5 Environmental Protection

Along with the safety objective, in 1999 the RSA introduced environmental protection as one of the Act's objectives. This created a need for Transport Canada, Rail Safety to work within the broader environmental legislative framework under which the railway industry is governed. This framework includes Environment Canada, the provincial governments and Transport Canada's Transport Dangerous Goods Directorate. These different organizations appear to be relatively well harmonized and complementary.

To effectively fulfill its environmental protection role, Transport Canada, Rail Safety will require increased expertise and resources. Additional effort will be needed to carry out these responsibilities. Resources will be required to oversee the development and implementation of a protocol for emergency response to environmentally hazardous goods, as well as the standard for response to dangerous goods, environmentally hazardous goods and other goods. Additional resources will also be needed to monitor the annual environmental plans and audits submitted by the railway companies.

11.2.6 Research and Development

The Federal Railroad Administration (FRA) in the U.S. sponsors a significant amount of research and development that benefits all railways operating in North America, and both CN and CP invest in new technologies that address issues particular to their own operating environments. Nonetheless, additional research and development are required to address safety issues that apply broadly to the Canadian operating environment, such as research into better materials for manufacturing wheels and rail that can withstand Canadian winters. The Panel has recommended that the railway industry and Transport Canada should jointly fund scientific and technological innovation to address safety issues that are specific to the Canadian operational and physical environment.

We noted that Transport Canada, Rail Safety needs to recognize the importance of assessing and facilitating the implementation of new technologies. An increased capacity will be required to carry out this role effectively.

Furthermore, the Rail Safety Directorate lacks the specialized expertise in human factors to ensure that the human element of accident causes is well understood. This capacity needs to be developed. Consideration should be given to hiring technically competent personnel and providing introductory training in human factors to existing staff.

11.2.7 U.S. Harmonization

In our discussions with the U.S. FRA, officials stressed that mutual respect had been built up with their Canadian counterparts, and referred repeatedly to how their collegiality had facilitated the resolution of a number of cross-border issues. The main way to resolve such issues is to have more opportunity to work and spend time together. Financial constraints, such as a shortage of human and financial resources in Transport Canada's Rail Safety Directorate, can make this difficult. The Government of Canada should increase its contribution to joint research and development activities with the United States.

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Addressing Transport Canada's resource problem will take considerable time and money. Staffing levels of the department's Rail Safety organization should be reviewed in order to ensure that it has sufficient people with the right expertise to address the demands placed upon it. Transport Canada can then plan to create new capacity and renew its staff and expertise.

RECOMMENDATION 53

Transport Canada should:

- develop a multi-year human resources plan for the renewal of staff and expertise in the Rail Safety Directorate with particular emphasis on recruiting and developing the skills required for a modern performance-based safety management system;
- develop a related plan to ensure adequate provision of inspection and other services in the regions, and to the provinces, pursuant to their harmonization arrangements with the federal government;
- make a commitment to re-think its approach to inspection and audit so that the skills and time of the inspectors and other professional personnel in Transport Canada are appropriately allocated to meet the safety needs of the industry and the public under a performance-based safety regime; and
- give high priority to recruiting and developing within the Transport Canada, Rail Safety Directorate or regions, the analytical and management skills necessary for a modern risk-based safety management system.

Essentially, the federal government needs to provide the funds required to adequately resource the railway safety function in Transport Canada. Lack of available government funds is not a valid argument. We note that not only does the increase in rail traffic result in the need for more regulatory oversight, but it also generates additional revenue for the railway companies and an accompanying increase in tax revenue for the Government of Canada.[6]

RECOMMENDATION 54

The Government should provide the necessary resources to renew and expand railway safety capacity in Transport Canada.

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[6] The Railway Association of Canada states that the total taxes paid by their member railway companies have increased to $1.1 billion in 2006, from just under $0.5 billion in 1997, *2007 Railway Trends* (October 2007), page 13.

CHAPTER 12
BUILDING RELATIONSHIPS

In this report, we have examined the national railway safety framework in Canada. We have recommended improvements through amendments to the *Railway Safety Act* (RSA) itself, and other changes to governance, regulatory procedures and practices, guidance for safety management systems (SMS), information collection and dissemination, resolution of proximity issues, environmental protection and response, operations, support for innovation and the need for additional resources. We have also pointed out where we found that the existing framework is functioning well and should be maintained.

Over and above the processes and systems, effective functioning of the RSA requires the collaboration and participation of all interested stakeholders. We note many good examples where stakeholders have established cooperative processes aimed at educating the public and promoting railway safety. Operation Lifesaver and Direction 2006 are successful cooperative efforts involving railway companies, Transport Canada, other levels of government, public safety organizations, police, emergency responders, unions, and public and community groups. The joint proximity initiative between the Railway Association of Canada and the Federation of Canadian Municipalities is building a common approach to the prevention and resolution of issues that arise when people live and work in close proximity to railway operations.

We learned that in organizations with effective safety management systems, a healthy safety culture is key, and that such a culture cannot be developed and maintained without mutually supportive, collaborative working relationships. We observed that the relationships developed in well-managed occupational health and safety committees contribute to a spirit of collaboration and an atmosphere of mutual trust and respect.

As a Panel, we firmly believe that improving railway safety depends on building and maintaining strong and effective relationships among the many institutions, organizations and individuals responsible for railway safety. Particular attention must be paid to the important relationship between the railway industry and the regulator, Transport Canada.

The restructuring of the railway industry, the introduction of the industry-led rule-making process, the implementation of the SMS approach and the resource pressures have all affected the relationship between the regulator and the industry. We observed frustration on the part of both. The industry feels that Transport Canada lacks transparency, is not respecting the rule-making provisions of the RSA

as they were intended, and does not recognize a company's responsibility for the safety of its railway operations. On the other hand, Transport Canada feels that the industry does not understand or respect its ultimate responsibility for a safe national railway system.

Despite the challenges, we observed that all players were highly committed to acting in the best interests of railway safety. We are convinced that this provides a sound basis on which to build.

It is important to reiterate here that the RSA was designed to foster a spirit of cooperation between industry and government. As we have noted, we find that the framework of the Act and its general principles are fundamentally sound. In its objective, the Act very clearly provides that the railway companies are responsible for ensuring the safety of their operations. The Act also encourages the collaboration and participation of interested parties in improving railway safety.

The Panel is convinced that openness, transparency and accountability are key to restoring trust. The cooperative and collaborative approaches that we recommend for regulation and rule making, as well as for consultation, are intended to encourage and reinforce relationships. The success of safety management systems depends on trust, commitment and solid relationships.

The way in which the current rule-making process is functioning is probably the single, most important contributor to the loss of mutual trust and respect between the regulator and the railway industry. There is a pressing need for Transport Canada and the industry to re-establish an effective approach to rule making. Transport Canada must be more transparent in its actions, so that its perspectives are clear and surprises can be avoided. A key issue for the rule-making process will be for the department to provide industry with the rationale for requiring it to file a new rule, or for a condition it wishes attached to a rule. For its part, the railway industry needs to listen carefully to the input provided by the department before submitting any proposed rule for approval by the Minister.

We recommend that Transport Canada, in consultation with stakeholders, establish the process to formulate and adopt rules and that this process be entrenched as a regulation. Such a regulation should clarify the processes, roles and accountabilities required in the rule-making process. The need for both parties to work collaboratively to develop the regulation should provide spin-off benefits.

Another area in which transparency can be improved is the delegation of powers under the *Railway Safety Act.* Railway companies told us that they could not ascertain which powers under the RSA are delegated to whom. Transport Canada should provide written confirmation to the industry of this delegation.

We have recommended how Transport Canada should revive and improve its consultation processes to achieve collaboration and participation at all stages. We regret the near disappearance of the Railway Safety Consultative Committee. Furthermore, we are struck by the fact that the committee that undertook the 1994 review of the RSA recommended "implementation of a robust formal consultation mechanism."[1] That committee also provided the rationale for such a process.

> If the government is to concentrate its efforts on ensuring public safety while allowing the safety of railway operations to be handled primarily by the railway companies, information dissemination, including the results of safety audits and safety performance, should take on more prominence. Moreover, increased reliance on the railways to manage their own affairs should be balanced by the responsibility of listening to more feedback from the general public and interested parties on issues of public concern and perceptions of rail safety.[2]

The Panel strongly believes that the relationship of mutual trust and respect requires the industry to recognize Transport Canada's ultimate responsibility for a safe national railway system. Railway companies must accept that there is a limit to collaboration. Acting on the advice of departmental officials, it is the Minister who has the final decision-making authority in the public interest.

The effective implementation of the *Railway Safety Act* requires the collaboration and participation of interested parties in improving railway safety. Effective collaboration hinges on building an atmosphere of mutual trust and respect.

RECOMMENDATION 55

The industry and Transport Canada must work at restoring mutual trust and respect. In particular:

- **Transport Canada and the industry must be more open and transparent in their dealings with each other; and**
- **Transport Canada must recognize the railway's responsibility for safe railway operations and conduct itself accordingly, while the industry must fully recognize and respect the regulator's ultimate responsibility for a safe national railway system.**

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[1] Railway Safety Act Review Committee, *On Track: The Future of Railway Safety in Canada*, Report of the Railway Safety Act Review Committee (December 1994), page 54.

[2] Ibid, page 54.

We note that it is quite common in the Canadian parliamentary system to have a provision in new legislation requiring it be reviewed, usually five years after it comes into effect. The objective of these reviews is to assess the appropriateness and currency of new legislation.

The form of review varies from statute to statute, but the practice itself is normal. The use of an independent Panel to conduct these reviews provides impartiality and has been the traditional practice for the transportation sector, most recently with the reviews of the *Canada Transportation Act,* the *Canada Marine Act (CMA)* and the *Canadian Air Transport Security Authority (CATSA) Act.*

The original RSA that came into force in 1989 had a review clause and an independent committee reviewed the operations of the Act and submitted its report, *On Track: The Future of Railway Safety in Canada,* to the Minister with recommendations for change. We reviewed this report and were struck by the depth of analysis and quality of the recommendations. We are surprised that when the Act was modified in 1999 it did not contain a review clause.

Based on our experience with this Review of the RSA, we are convinced that the review process provides significant benefits. Not only does it ensure that the Act and its provisions are current, the process itself provides the opportunity for many stakeholders to present their challenges, successes and views with respect to improving safety of the railway industry. We observed that many positive actions were initiated during the Review. We believe that they stemmed directly from this process, which created the opportunity for stakeholders and, in particular, the industry and the regulator, to hear, reflect on, and respond to the views of others.

Discussions with representatives from other countries at an international conference on railway safety revealed that they had used Canada's *Railway Safety Act* as a model. These representatives noted the positive aspects of the Act and were impressed that it had undergone two reviews by independent panels.

RECOMMENDATION 56

A review of the *Railway Safety Act* should occur before the expiration of a period of five years after the coming into force of the amendments that follow from the present review.

APPENDIX A

TERMS OF REFERENCE: RAILWAY SAFETY ACT REVIEW

BACKGROUND

The *Railway Safety Act*, which came into effect in January 1989, was designed to advance rail safety in Canada by giving the Minister of Transport responsibility for rail safety regulation; providing a modern regulatory framework, together with a streamlined regulation development and approval process; and providing railway companies with greater freedom to manage their operations safely and efficiently.

Since then, changes have occurred in the railway industry (e.g., there has been an increase in the number of federally regulated railway companies and CN has been privatized) and exceptional productivity gains have been achieved.

Since 2002, there has also been an increase in railway accidents and main-track train derailments in Canada. In 2005 - 2007, derailments have led to fatalities, serious injuries and significant environmental damage in British Columbia, Alberta and Quebec. Concerns have been expressed by private citizens and a number of groups including provincial governments, railway employees, aboriginal and environmental groups with respect to railway safety in Canada. In addition, Transport Canada officials have identified deficiencies with the Act during their day-to-day administration of legislative provisions.

Although Transport Canada has taken significant safety enforcement action across Canada over the past years to address these problems, there is a view that the current regulatory framework does not provide the full set of tools to effectively deal with them. There is also a view that the current framework needs to be modernized and better aligned with safety legislation in place for other modes of transport in Canada.

Accordingly, the government announced the *Railway Safety Act* Review to further improve railway safety in Canada and promote a safety culture within the railway industry while preserving and strengthening the vital role this industry plays in the Canadian economy.

PROCESS

An Advisory Panel of four part-time members appointed by the Minister of Transport, Infrastructure and Communities will conduct independent study and analysis, undertake consultations, and prepare a report with findings and recommendations.

The Panel will consult a wide range of stakeholders, including the public, railway companies and their industry associations, railway company employees and their unions, railway customers (e.g., travellers and shippers), provinces and territories, municipalities, aboriginal and environmental groups as well as Transport Canada and other federal government departments and agencies. The Panel will hold meetings across Canada where individuals and groups can present their views and will have a website to accommodate input from the public. To assist those who wish to make a submission, the Panel will prepare a Guidance Document setting out key issues of interest.

SCOPE OF THE PANEL'S WORK

The Panel will prepare a report for the Minister of Transport, Infrastructure and Communities with findings and recommendations to improve railway safety, including possible amendments to the *Railway Safety Act*. The report is to be submitted by October 2007.

The Panel will assess the working and overall efficiency of the *Railway Safety Act* and examine a number of specific issues including:

- enforcement powers with respect to administrative monetary penalties;
- baseline safety requirements ensuring that new rail companies are willing and able to meet minimum safety requirements before starting operations in Canada;
- consistency of rule application given that rules apply to an individual railway company;
- delegated powers to railway safety inspectors directly, bypassing the Minister entirely;
- defining engineering requirements based on the phrase "sound engineering principles" which is undefined within the *Railway Safety Act*; and
- establishing a complete legislative authority that applies to railways within Canada's constitutional authority.

The review will not address the limited number of security-related provisions that were added to the *Railway Safety Act* in 1999, as they do not relate to the concerns that have provided the impetus for the review.

RESPONSIBILITIES OF THE REVIEW SECRETARIAT

A full-time Secretariat of eight to 10 people will be established within Transport Canada under the direction of an Executive Director. The Secretariat will have key responsibilities in support of the Panel's mandate and in the assessment and implementation of the Panel's recommendations and observations.

1. PROJECT PLANNING AND ADMINISTRATION

Under the panel's guidance, the Secretariat will develop and manage the overall project work plan to ensure all timelines are met and products are delivered to complete the Panel's review by October 31, 2007. In addition to providing support to the Panel, the Secretariat will provide the link to Transport Canada, other government departments and agencies, external stakeholders and international organizations. The Secretariat will also coordinate the drafting, publication and submission of the Panel's report.

2. CONSULTATION AND COMMUNICATION

The Secretariat will be responsible for managing the consultation program. A guidance document setting out key issues will be drafted for the Panel's approval and circulation to interested parties. The Secretariat will manage the stakeholder submissions and ensure the Panel members are briefed and prepared for their meetings. The Secretariat will also be responsible for managing communications associated with the Review.

3. RESEARCH AND ANALYSIS

All stakeholder submissions will be reviewed, summarized and tracked. Policy issues will be analyzed and submitted to the Panel. The Secretariat will develop a Research Plan for the Panel's approval and undertake studies and analysis on key subjects.

Reporting and Timing

The Panel will prepare a report for the Minister of Transport, Infrastructure and Communities that includes findings and recommendations on the provisions and operation of the *Railway Safety Act* and on other issues falling within the scope of these Terms of Reference. The Panel will submit its report by October 31, 2007.

TIMELINES:	
January 3 – January 31, 2007	*Railway Safety Act* Review Secretariat established and Panel members appointed
February 1 – March 31, 2007	Prepare Consultation Plan, Guidance Document and Research Plan
April 1 – July 31, 2007	Panel conducts consultations, research and analysis
August 1 – September 30, 2007	Panel deliberations and initial draft report
October 1 – October 31, 2007	Panel develops final report and submits to the Minister

APPENDIX B

BIOGRAPHIES OF ADVISORY PANEL MEMBERS

The Honourable Doug Lewis (Chair) is a Chartered Accountant and lawyer. Mr. Lewis served as the Member of Parliament for the riding of Simcoe North (Ontario) for the period from 1979 to 1993. During that time he served as Government House Leader, Attorney General and Minister of Justice, Minister of Transport and Solicitor General. Mr. Lewis currently practices law in Orillia, Ontario.

Mr. Pierre-André Côté holds a bachelor in law from the University of Montreal and a post-graduate diploma in public law from the Université de Toulouse. He was Professor of Law at the University of Montreal from 1970 to 2005, and has authored numerous articles and a major treatise on the interpretation of statutes. Mr. Côté is with the firm of Bélanger Sauvé, in Montreal. His fields of expertise include administrative law, judicial review of government actions, and civil rights and freedoms.

Mr. Martin Lacombe worked as a professional executive, manager, policy developer and leader in the railway industry in positions ranging from front-line operations supervision, to short line President and CEO capacities. As well as working with CN, VIA Rail, the Canadian Transport Commission, the Railway Association of Canada, and Genesee and Wyoming Railway, Mr. Lacombe has worked in the railway industry in Australia and Brazil.

Mr. Gary Moser is the former Chief Executive Officer of the Health Employers Association of British Columbia. He was previously a Deputy Minister in the Provincial Government of British Columbia. He currently operates a private consulting practice focusing on labour relations.

Gary Moser, Pierre-André Côté, Doug Lewis and Martin Lacombe, March 2007

APPENDIX C

CHRONOLOGY OF PUBLIC CONSULTATIONS, MEETINGS AND SITE VISITS

WEEK OF...	LOCATION	PUBLIC CONSULTATIONS, MEETINGS AND SITE VISITS
February 25	Ottawa	- Transport Canada - Rail Safety Directorate - Railway Association of Canada - Transport Canada - Communications Group - Transport Canada - Deputy Minister, and Associate Deputy Minister, Safety and Security
March 11	Ottawa	- Transport Canada - Departmental General Counsel, Legal Services
	Montreal	- CN, CP, VIA, Genesee Wyoming, AmeriRail and Agence métropolitaine de transport (AMT) - Site visits to CN Taschereau Yard, CP Côte St-Luc Yard, CN Champlain Sub-dispatching Centre and VIA Rail Operations Centre and Maintenance Facility
April 1	Ottawa	- Transportation Safety Board - Transport Canada - Civil Aviation Directorate - Canadian Chemical Producers' Association - Transport Canada - Rail Safety Directorate - Railway Association of Canada - Transport Canada - Transport Dangerous Goods Directorate
April 8	Huntsville	- Transport Canada - Rail Safety Directorate National Management Team
April 22	Calgary	- Public Consultation - CP - Tour of Network Management Centre and site visit to CP Alyth Yard - Trip aboard CP Track Evaluation Car (Calgary to Edmonton)
	Edmonton	- Public Consultation - Site visit to CN Network Operations Centre - Alberta Infrastructure and Transportation and Emergency Management Alberta
April 29	Ottawa	- Mervin Tweed, M.P., Chair, Standing Committee on Transport, Infrastructure and Communities - The Honourable David Collenette, P.C., former Minister of Transport

WEEK OF...	LOCATION	PUBLIC CONSULTATIONS, MEETINGS AND SITE VISITS
May 6	Vancouver	- Helicopter tour of Port of Vancouver including inter-modal transfer and Deltaport - Site visit to CN North Vancouver Yard - Trip by rail and highway to Whistler via Squamish subdivision through Cheakamus Canyon (hi-rail vehicle and track geometry car) - Trip by rail to Darcy, Lillooet and Kelly Lake (return trip to Vancouver via Boston Bar and Fraser River Canyon)
May 13	Vancouver	- Public Consultation - British Columbia Safety Authority and British Columbia Ministry of the Environment - Transport Canada - Prairie and Northern Region railway safety managers/inspectors - Transport Canada - Pacific Region railway safety managers/inspectors - CAW-TCA (formerly Canadian Auto Workers)
	Kamloops	- Public Consultation - Site visit to Rocky Mountaineer operations
	Prince George	- CN Health and Safety Committee (chairs) - Public Consultation
June 3	Saskatoon	- Public Consultation
	Regina	- Public Consultation
	Winnipeg	- Manitoba Infrastructure and Transportation - Site visit to CN Symington Yard (locomotive testing and track evaluation car) - Former Regional Director General, Prairie and Northern Region, Transport Canada - Public Consultation
June 24	Montreal	- VIA Rail - CN - Transport Canada - Quebec Region railway safety managers/inspectors - Agence métropolitaine de transport (AMT) - Transportation Development Centre - Transport Canada - Regional Director General, Quebec Region - Public Consultation - E. Hunter Harrison, CEO, CN
	Quebec City	- Ministère des Transports Québec
	Montmagny	- Site visit (scene of derailments)
	Quebec City	- Montreal, Maine and Atlantic Railway - Public Consultation
July 8	Ottawa	- Railway Association of Canada

WEEK OF...	LOCATION	PUBLIC CONSULTATIONS, MEETINGS AND SITE VISITS
July 15	Moncton	- New Brunswick Ministry of Transportation
	Saint John	- New Brunswick Southern Railway Company
	Moncton	- Public Consultation - Transport Canada - Atlantic railway safety managers/inspectors
	Dartmouth	- Transportation Safety Board
	Halifax	- Public Consultation - Nova Scotia Transportation and Public Works
July 30	Victoria	- British Columbia Ministry of Transportation
August 5	Thunder Bay	- Canadian Interagency Forest Fire Centre and Ontario Ministry of Natural Resources - Public Consultation
	Toronto	- GO Transit - Ontario Ministry of Transportation - Transport Canada - Ontario railway safety managers/inspectors - CP Health and Safety Committee representatives - CP - Public Consultation
August 19	Ottawa	- Environment Canada - Canadian Transportation Agency - Teamsters Canada Rail Conference - Public Consultation
	Washington, D.C.	- American Short Line Railroad Association - Government Accountability Office - Federal Railroad Administration - CN and CP - The Honourable Michael Wilson, Canadian Ambassador to the United States of America - National Transportation Safety Board - American Association of Railroads
August 26	Ottawa	- Human Resources and Social Development Canada - Labour Program
	Labrador City/ Wabush	- Mayors and community officials
September 2	Ottawa	- Transport Canada - Rail Safety Directorate - Transportation Safety Board - CN - CP
September 9	Montreal	- Air Transat
September 16	All regions	- Validation visits with a cross-section of stakeholders
September 30	Goa, India	- International Railway Safety Conference
October 14	Vancouver	- Railway Association of Canada Annual General Meeting

APPENDIX D

RESEARCH STUDIES

Causes of Accidents and Mitigation Strategies
G.W. English and T.W. Moynihan, TranSys Research Ltd., July 2007

The Development of Work/Rest Rules for Railway Operating Employees: A Case Study
Harvey Sims, Sussex Circle Inc., August 2007

An Examination of the Regulated Requirement for Canadian Railway Safety Management Systems
Terry Kelly, SMS Aviation Safety Inc., August 2007

The Governance of Railway Safety in Canada
James Mitchell and Nigel Chippindale, Sussex Circle Inc., September 2007

The Legislative and Institutional Framework for Railway Safety in Canada
Deana Silverstone, July 2007

Performance Measurement in Railway Safety
Milt Poirier, QGI Consulting Ltd., July 2007

Rail Transport and the Environment in Canada
Liane E. Benoit, Benoit and Associates, August 2007

Railway Safety Technologies
T.W. Moynihan and G.W. English, Research and Traffic Group, July 2007

The State of Rail Safety in Canada
Joseph Schulman, CPCS Transcom Limited, August 2007

A Study of the Role of Human Factors in Railway Occurrences and Possible Mitigation Strategies
Maury Hill, Maury Hill and Associates Inc., Adaptive Safety Concepts, August 2007

Study Pertaining to: Canada-U.S. Harmonization
D.W. Flicker, RRF Consultants Inc., September 2007

APPENDIX E
PROFILE OF RAILWAY COMPANIES AS OF NOVEMBER 2007

1. RAILWAY COMPANIES UNDER FEDERAL JURISDICTION

A railway under the legislative authority of Parliament is one that holds a valid certificate of fitness (COF). This list of federally regulated railways gives the date of the Canadian Transportation Agency decision which authorizes the issuance of each new or most recently amended certificate.[1]

RAILWAY COMPANY	COF ISSUE DATE
Arnaud Railway Company	February 12, 1997
BNSF Railway Company	April 17, 2007
Canadian National Railway Company	April 23, 2007
Canadian Pacific Railway Company	August 9, 2007
Chemin de fer de la Matapédia et du Golfe Inc.	September 28, 2007
City of Ottawa carrying on business as Capital Railway	June 6, 2007
CSX Transportation Inc.	October 31, 2006
Eastern Maine Railway Company	June 30, 1997
Essex Terminal Railway Company	April 21, 1997
Ferroequus Railway Company Limited (Suspended)	May 19, 2005
Goderich-Exeter Railway Company Limited	November 13, 1998
Great Canadian Railtour Company Ltd.	January 17, 2007
Hudson Bay Railway Company	May 9, 2001
International Bridge and Terminal Company	June 27, 1997
Kelowna Pacific Railway Company	February 18, 2000
Kettle Falls International Railway Company	December 10, 2004
Maine Central Railroad Company and Springfield Terminal Railway Company	October 28, 1997
Minnesota, Dakota & Western Railway Company	June 27, 1997
Montreal, Maine & Atlantic Railway, Ltd. and the Montreal, Maine & Atlantic Canada Co.	September 9, 2005
National Railroad Passenger Corporation (Amtrak)	June 26, 1997

[1] http://www.cta-otc.gc.ca/rail-ferro/companies/companies_e.html. CTA Decision No. 197-R-2007 of April 23, 2007 cancelled Certificates of Fitness for Algoma Central Railway Inc., and Sault Ste. Marie Bridge Company (now integrated into CN's operations).

RAILWAY COMPANY	COF ISSUE DATE
Nipissing Central Railway Company	July 11, 1997
Norfolk Southern Railway Company	December 19, 1996
Okanagan Valley Railway Company	October 30, 1998
Ottawa Central Railway Inc.	December 1, 2000
Pacific and Arctic Railway and Navigation Company/ British Columbia Yukon Railway Company/ British Yukon Railway Company Limited *carrying on business as or proposing to carry on business as* White Pass & Yukon Route	November 25, 1997
Quebec North Shore & Labrador Railway Company	November 2, 2007
RaiLink Canada Ltd.	June 5, 2006
St. Lawrence & Atlantic Railroad (Québec) Inc.	November 24, 1998
Sydney Coal Railway Inc.	May 6, 2004
Toronto Terminals Railway Company Limited	July 28, 1999
Tshiuetin Rail Transportation Inc.	April 1, 2005
Union Pacific Railroad Company	June 16, 1997
VIA Rail Canada Inc.	May 6, 2004
Wabush Lake Railway Company, Limited	February 12, 1997

2. RAILWAY COMPANIES UNDER PROVINCIAL RAILWAY SAFETY JURISDICTION[2]

Province	Provincial Railway Safety Legislation	Provincial Railway Companies	MOU with TC	Enforcement
British Columbia	***Railway Safety Act*** (SBC 2004, c. 8)	5 short lines: - BCR Port Subdivision Ltd. - Southern Railway of British Columbia Ltd. - Southern Railway of Vancouver Island Ltd. - Grand Forks Railway Company - International Rail Road Systems 15 tourist/ recreational trains: - B.C. Forest Museum - Westcoast Railway Association - Fort George Railway Society - Fort Steele Heritage Town - Vancouver Board of Parks and Recreation - Prince George Railway Museum - Kamloops Senior Citizens Railway Society - Kimberley Bavarian Society - Nelson Electric Tramway Society - Vancouver Zoological Centre - Alberni Pacific Railway - Kettle Valley Railway Society - Bear Creek Park Railway - Kamloops Heritage Railway Society - Tub Boat Junction Railway 2 transit: - Expo Line - Millennium Line and ~60 industrial lines	No	- Province inspects, audits and enforces

[2] Information provided by provincial authorities; current to November 2007. Note that no railways operate under provincial jurisdiction in Newfoundland and Labrador, or Prince Edward Island.

Province	Provincial Railway Safety Legislation	Provincial Railway Companies	MOU with TC	Enforcement
Alberta	***Railway (Alberta) Act***, (RSA 2000, c. R 4)	2 short lines: - Athabasca Northern Railway - Alberta Prairie Steam Tours 4 heritage railways: - Fort Edmonton Park - Calgary Heritage Park - Central Alberta Railway Museum - Alberta Railway Museum ~275 industrial railways	Yes *(expired)*	- TC inspects and recommends action - Province enforces
Saskatchewan	***The Railway Act***, (1989 c. R-1-2 Statutes of Saskatchewan) amended in 1993, 1996, 2001, 2005	7 short lines: - Southern Railway Cooperative Ltd. - Carlton Trail Railway - Red Coat Road & Rail - Great Western Railway Ltd. - Arborfield Thunder Rail - Wheatland Railway Inc. - Fife Lake Railway Ltd.	Yes	- Province has not yet utilized TC services
Manitoba	***The Provincial Railways Act*** (C.C.S.M. 1995, c. R15)	2 short lines: - Central Manitoba Railway - Keewatin Railway Company 1 excursion: - Prairie Dog Central	Yes	- TC inspects and recommends action - Province has broad enforcement powers
Ontario	***Shortline Railways Act*** (S.O. 1995, c. 2)	12 short lines: - Huron Central Railway - Port Colborne Harbour Railway - St. Thomas and Eastern Railway - Caledonia and Hamilton Southern Railway Co. Ltd. - Ontario Southland Railway - Guelph Junction Railway - Barrie Collingwood Railway - Orangeville Brampton Railway - Arnprior Nepean Railway - Port Stanley Terminal Railway - South Simcoe Railway - York-Durham Railway	Yes	- TC inspects and enforces

Province	Provincial Railway Safety Legislation	Provincial Railway Companies	MOU with TC	Enforcement
Quebec	***Loi sur les chemins de fer*** (L.R.Q., c. C-14.1 1993) for certification to operate ***Loi sur la sécurité du transport terrestre guidé*** (L.R.Q., c. S-3.3 1988) for regulation of safety	6 short lines: - Chemins de fer Québec-Gatineau - La Compagnie du Chemin de fer de Québec Central - Chemin de fer Charlevoix - Corporation du Chemin de fer de la Gaspésie - Compagnie du Chemin de fer de l'Outaouais - Compagnie du Chemin de fer Lanaudière inc. 1 tourist train : - Train à vapeur Hull-Chelsea Wakefield, operating on *Compagnie du Chemin de fer de l'Outaouais track* 3 industrial lines: - La Compagnie de Chemin de fer Cartier - La Compagnie du Chemin de fer Roberval-Saguenay - Compagnie de Chemin de fer de la Rivière Romaine	Yes	- TC inspects and recommends action - Quebec enforces
New Brunswick	***Shortline Railways Act*** (1994 c. S-8.1)	2 short lines (only 1 covered by the MOU): - New Brunswick East Coast Railway - New Brunswick Southern Railway 1 excursion (not operating): - Salem and Hillsborough Railroad	Yes	- TC inspects and recommends action - Province enforces
Nova Scotia	***Railways Act*** Chapter 11 of the Acts of 1993 (amended in 1995-96, 2001)	2 short lines: - Cape Breton & Central Nova Scotia Railway - Windsor & Hantsport Railway	Yes	- TC inspects and recommends action - Province enforces

3. RAILWAYS GOVERNED BY OTHER LEGISLATION

Several railways are operating that do not have certificates of fitness from the CTA, and are not regulated under corresponding provincial railway safety legislation, including:

PROVINCE	PROVINCIAL LEGISLATION	PROVINCIAL RAILWAY COMPANY
British Columbia	***British Columbia Transit Act*** (RSBC 1996, c. 38)	West Coast Express (commuter services in greater Vancouver)
Manitoba	***City of Winnipeg Charter*** (S.M. 2002, c. 39).	Greater Winnipeg Water District Railway
Ontario	***Greater Toronto Transportation Authority Act*** (S.O. 2006, c. 16)	GO Transit (commuter services in greater Toronto)
	Ontario Northland Transportation Commission Act	Ontario Northland
Quebec	***Loi sur l'Agence métropolitaine de transport*** (L.R.Q., c. A-7.02)	l'Agence métropolitaine de transport, AMT (commuter services in greater Montreal)

APPENDIX F
RECOMMENDATIONS

The Panel finds that the *Railway Safety Act* and its general principles are fundamentally sound, but it recommends that a number of improvements be implemented.

Governance

1. Transport Canada, Rail Safety Directorate should assert its existing responsibility to provide functional direction to regions to ensure:

   - clear and consistent guidance on matters of rail safety rules and regulations;
   - effective communication on rail safety objectives within a national framework; and
   - regional managers are held accountable for their actions within that framework.

2. The *Railway Safety Act* should clarify that railway safety inspectors exercise their powers under the authority of the Minister.

3. The Railway Safety Consultative Committee (RSCC) should be revived as a smaller and more focussed group. It should meet regularly for general information sharing and consensus building. It should serve as the key forum for discussion of:

   - future directions in rail safety, rule making and regulation;
   - policy issues of concern to the regulator and the regulated community; and
   - problems and issues of common concern, outside the formal rule-making process.

   A permanent secretariat should be set up in Transport Canada, Rail Safety Directorate to support the ongoing activities of the RSCC. The RSCC may be supported by specific working groups and technical committees.

4. Transport Canada should institute the practice of regular consultation with concerned provinces on all matters to do with railway safety affecting provincially regulated railways. The Federal-Provincial Working Group on Railway Safety should be used more deliberately as an information sharing and consultative forum.

5. The *Railway Safety Act* should be amended to authorize the Minister to enter into agreements with provincial governments or foreign governments or any international organization with respect to all matters relating to railway safety and security.

Regulatory Framework

6. Section 3(c) of the *Railway Safety Act* should be amended to read: "The objectives of this Act are to …(c) recognize the responsibility of railway companies *to demonstrate, through their safety management systems, that they continuously manage their safety risks to a level as low as reasonably practicable.*"

7. Section 2(2) of the *Railway Safety Act* should be amended to provide that the Act applies in respect of all matters of railway safety and security under the legislative authority of Parliament.

8. A definition of "railway company" should be included in the *Railway Safety Act.*

9. A railway should be required to obtain a Rail Operating Certificate (ROC) as a precondition to obtaining a Certificate of Fitness (from the Canadian Transportation Agency) and to commencing or continuing operations. Transport Canada will issue the ROC when satisfied that the railway meets baseline safety requirements determined by regulation. Existing companies would automatically be issued the ROC. Transport Canada would have the power to suspend and/or cancel the ROC if the company fails to meet baseline safety requirements.

10. A process for the formulation and/or adoption of rules, standards and exemptions should be established by regulation. All stakeholders must have an opportunity to be involved in developing the process. This regulation should embody the following principles:

    - transparency and openness;
    - early and meaningful involvement of Transport Canada;
    - appropriate participation of stakeholders;
    - high quality legal drafting; and
    - consistency with section 3 of the *Railway Safety Act* to facilitate a modern, flexible and efficient regulatory scheme.

11. The *Railway Safety Act* should be amended to clarify that a railway company may delegate its power to develop and submit a rule to the Minister for approval.

12. The Minister of Transport should have the power, after appropriate consultation, to extend the application of an existing rule to a given railway company. There should also be a process in the Act for a railway company to adopt an existing rule.

13. An administrative monetary penalty (AMP) scheme should be included in the *Railway Safety Act* as an additional compliance tool. The scheme should include the following elements:

- the decision to impose a penalty should be the Minister's decision;
- before a decision is made, due process should be followed;
- the decision should be reviewable by the Transportation Appeal Tribunal of Canada;
- the level of fines should be consistent with those imposed in the aviation and marine modes; and
- an enforcement policy prescribing parameters for AMPs should be made public.

14. Sections 31.1(4) and 31.2(3) of the *Railway Safety Act* should be amended so as to authorize the Transportation Appeal Tribunal of Canada, in the case of a review of an order of a railway safety inspector, to confirm, revoke or alter the order.

15. Similar amendments should be made in relation to the review of a ministerial order under sections 32.1(5) and 32.2(3) of the RSA.

16. All orders, regulations and rules related to safety should be reviewed and those that are obsolete should be amended or repealed.

Safety Management Systems

17. The Panel supports the safety management system approach and recommends that both the railway companies and Transport Canada focus their efforts to improve its implementation.

18. Transport Canada, Rail Safety Directorate and the railway industry must take specific measures to attain an effective safety culture.

19. The industry must take every appropriate measure to ensure the effectiveness of local occupational health and safety committees. Specifically, they should involve employees in identifying hazards, and assessing and mitigating risks as part of safety management.

20. Transport Canada, Rail Safety Directorate should be organized so as to better integrate safety management systems as the key focus of its oversight activities.

21. In order to better reflect the fact that the current railway safety inspector (RSI) performs both inspections and audits, the title should be changed to Railway Safety Officer.

22. Transport Canada should focus its safety management systems audits to emphasize the assessment of the safety performance of railway companies.

23. Transport Canada, Rail Safety Directorate should ensure that audits of railway companies' safety management systems meet the professional standards of public sector audits.

24. Transport Canada and industry should work together to develop the tools to assist railway companies in improving their safety management systems, including:

    - proactive safety performance measures;
    - identification of the company data needed to support these measures;
    - measurement of safety culture;
    - guidance on company safety-risk profiles and risk assessments of ongoing activities;
    - user-friendly safety management system tools for small railway companies;
    - evaluation techniques to supplement existing audits and inspections; and
    - a means of involving railway employees at all levels and, where possible, through health and safety committees and representatives.

Information Collection, Analysis and Dissemination

25. Transport Canada should be responsible for railway safety data collection and ensure that the needs of government agencies are met and that there is no duplication or confusion for reporting entities and stakeholders. There should be a regular timetable for reporting, and ad hoc demands for information or requests must be accompanied by valid reasons and should be kept to a minimum.

26. Transport Canada should give the highest priority to putting in place a robust program of data collection and analysis in order to measure railway safety performance, and should be provided with the necessary resources to do so.

27. A secure electronic database should be established to enable electronic filing of railway safety data by railway companies.

28. Transport Canada, in consultation with other departments and agencies, should create a one-stop reporting system for immediate reporting of accidents and for disseminating that information throughout all levels of government and agencies.

29. Transport Canada should work with the provinces to develop a comprehensive database, including both provincial and federal railway safety data.

30. Section 28 of the *Railway Safety Act* should be amended to clearly state that:

    - a railway safety inspector, for the purposes of exercising an audit or inspection function, may require any person to provide information or copies of any existing documents in any format (electronic or hard copy) specified by the railway safety inspector;
    - the request may be made from any location for documents stored at any location; and
    - the regulated party must provide the requested information or document in a timely manner.

31. Transport Canada should take a more active role in trend analysis and benchmarking of railway performance. This should involve a collaborative approach with government and industry stakeholders to develop appropriate and meaningful measures of risk and safety performance. To this end, Transport Canada must work with stakeholders to:

    - define data requirements;
    - develop reporting and data sharing mechanisms;
    - develop regulations requiring the industry to report data and performance measures; and
    - publish safety performance results.

32. To ensure that the public is informed on rail safety issues, the Government should make public:

    - purely factual information on a significant rail accident as soon as possible after the occurrence;
    - railway safety performance data (including information by company); and
    - information on enforcement actions.

33. Transport Canada, in consultation with industry, should determine whether, and to what extent, information provided by a railway company under the *Railway Safety Act* should be privileged information.

Proximity Issues

34. The *Railway Safety Act* should be amended to require the developer and municipalities to engage in a process of consultation with railway companies prior to any decision respecting land use that may affect railway safety.

35. Transport Canada, with the railways and other relevant stakeholders, should develop a program to:

    - identify where crossings can be closed;
    - limit the number of new crossings; and
    - improve safety at existing crossings.

    A five-year action plan should be developed and should include a provision for shared funding, including shared funding for improvement of private crossings. The Panel recommends increased funding for grade crossing improvements.

36. The railway companies should expand their outreach programs to encourage better communication with the entire community.

37. Public education programs, such as Operation Lifesaver and Direction 2006, to reduce trespassing and accidents at crossings, have been successful and should be renewed where necessary, and enhanced.

Environmental Protection and Response

38. Transport Canada, in conjunction with all stakeholders, should develop a protocol for emergency response to spills of environmentally hazardous goods that are not designated as "dangerous goods" under the *Transportation of Dangerous Goods Act.*

39. Transport Canada, in conjunction with the industry, should establish a Canadian standard of emergency response for the railway industry (for dangerous goods, environmentally hazardous goods and other goods).

40. Railway companies should file annual environmental management plans and regular compliance audits with Transport Canada. These plans should address, among other issues, pollution of railway property (i.e., yards and railway rights-of-way).

41. The *Rules for the Control and Prevention of Fires on Railway Rights-of-Way* are neither effective nor enforced, nor do they provide for an adequate process for compensation. Since these rules involve third parties, they should be replaced by regulations.

42. Transport Canada should develop sufficient capacity and expertise to ensure appropriate oversight of the railway industry with regard to all aspects of environmental protection.

Operational Issues

43. Fatigue management is dealt with in complementary ways, such as work/rest rules, fatigue management plans, and terms and conditions of employment.

    - The current *Work/Rest Rules* do not provide a satisfactory baseline framework for managing the risks associated with fatigue in rail operations. The rules should be amended to better reflect current science on fatigue management.
    - A robust system of fatigue management plans is needed. Transport Canada should audit them as it does for safety management system plans.
    - Fatigue management is also an issue that railways and employees should address in the establishment of terms and conditions of employment.

44. Transport Canada should require the application of voice recorders on all new and existing locomotives, with survivability provisions similar to those for locomotive event recorders.

45. The Government of Canada should ensure that rail traffic control in respect of operations in Canada be physically located in Canada in order to ensure appropriate regulatory oversight.

46. The reference to "sound engineering principles" in section 11 of the *Railway Safety Act* should be maintained and, where appropriate, specific standards or rules for construction, alteration and maintenance of a railway work should be developed.

47. A general duty of maintenance of a railway work, in accordance with "sound engineering principles," should be included in the *Railway Safety Act.* The railway company's SMS plan should demonstrate how that company ensures that its maintenance conforms with "sound engineering principles."

Scientific and Technological Innovation

48. Transport Canada should take a leadership role in any and all technological and scientific advances that would improve public safety.

49. In view of the importance of railways to the Canadian economy, the Government should strengthen its contribution to innovation and technological advancements in railway safety.

50. Transport Canada should increase its capacity to assess new technologies, and facilitate their implementation.

51. Transport Canada and industry should jointly fund scientific and technological innovation to address rail safety issues that are specific to the Canadian operating environment.

52. New locomotives should be designed to conform with acceptable standards of human factors engineering. Corrective strategies should also be developed to minimize any negative impact on safety resulting from poor design of existing locomotives.

Resources

53. Transport Canada should:

    - develop a multi-year human resources plan for the renewal of staff and expertise in the Rail Safety Directorate with particular emphasis on recruiting and developing the skills required for a modern performance-based safety management system;
    - develop a related plan to ensure adequate provision of inspection and other services in the regions, and to the provinces, pursuant to their harmonization arrangements with the federal government;
    - make a commitment to re-think its approach to inspection and audit so that the skills and time of the inspectors and other professional personnel in Transport Canada are appropriately allocated to meet the safety needs of the industry and the public under a performance-based safety regime; and
    - give high priority to recruiting and developing within the Transport Canada, Rail Safety Directorate or regions, the analytical and management skills necessary for a modern risk-based safety management system.

54. The Government should provide the necessary resources to renew and expand railway safety capacity in Transport Canada.

Building Relationships

55. The industry and Transport Canada must work at restoring mutual trust and respect. In particular:

    - Transport Canada and the industry must be more open and transparent in their dealings with each other; and
    - Transport Canada must recognize the railway's responsibility for safe railway operations and conduct itself accordingly, while the industry must fully recognize and respect the regulator's ultimate responsibility for a safe national railway system.

56. A review of the *Railway Safety Act* should occur before the expiration of a period of five years after the coming into force of the amendments that follow from the present review.

APPENDIX G

LIST OF SUBMISSIONS AND PRESENTATIONS

The following agencies, organizations and individuals made submissions and/or presentations to the Panel.

Aho, John
Alberta, Province of
Anderson, Kevin
Atha, Dennis
Atkinson, Jim
Bankes, Hugh
Barta, Robert
Bell, Don, M.P. (North Vancouver)
Benedict, E. Wayne
Berggren, Gillis
Biggs, Doug
Bilsky, Ray
Borek, Anthony
Brandon, City of
British Columbia Cattlemen's Association
British Columbia Ministry of Transportation
British Columbia Municipalities, Union of
British Columbia Safety Authority
Cameron, Craig
Canada Safety Council
Canadian Alliance of Partners & Employees of the Railroad
Canadian Association of Fire Chiefs
Canadian Council of Land Surveyors
Canadian Industrial Transportation Association
Canadian Interagency Forest Fire Centre – Railway Fire Prevention Task Team
Canadian National Railway Company (CN)
Canadian Pacific Railway Company (CP)
Canadian Wheat Board
Cariboo Cattlemen's Association
Cariboo Regional District
Carroll, Brian
CAW-TCA Canada
CAW-TCA Canada – Local 100 – Atlantic Region

CAW-TCA Canada – Local 100 – Prairie Region
Chartrand Sperlich, Madeleine
Chetwynd, District of
Chilliwack, City of
Chudnovsky, David, M.L.A. (Vancouver-Kensington)
Coldstream, District of
Conway, C.J.
Côte Saint-Luc, City of
Cotie, Todd
Cox, Michael A.
CPCS Technologies Corporation/Transtronic Inc.
Crête, Paul, M.P. (Montmagny-L'Islet-Kamouraska-Rivière-du-Loup)
Cummings, Lori
Daly, Rural Municipality of
Davidson, Don
Davies, Libby, M.P. (Vancouver East)
Defenders of Wildlife Canada
Delap, Rose
Demers, Greg
Eka Chemicals Canada Inc.
Eka Chemicals Canada Inc., Standing Advisory Committee
Elder, Susan
Engel, Edward
Engineers Canada
Fairfield, Anne (Faulkner)
Federation of Canadian Municipalities (FCM)
Fisher, Joanne C.
Fowler, Michael
Friends of the Earth/US
Geltman, Harold
Gillis, Don
Glover, Gwen
Great Canadian Railtour Company
Green Coalition / Les Amis de Meadowbrook
Groupe TRAQ (Transport sur rail au Québec)
Heads, John
Henriques, Augustin
Huron Central Railway Inc.
Igwemezie, Jude
Invasive Plant Council of British Columbia
Irving, David
Jasper Environmental Association

Jasper, Municipality of
Johnston, Jeff
Kamloops, City of
Keene, Steven B.
Kelly, Dale – Chief Fire Prevention Officer, Red Deer, Alberta
Labrador City, Town of
Lac La Hache Livestock Association
Lake Wabamun Residents Committee
Lallouz, Luba
Lapadat, S. A.
LeBlanc, Sylvia
Longueuil, Agglomération de
Lundquist, Bill
Lytton First Nation
Lytton, Village of
Macdonald, R.
MacLean, Donald
MacLean, Pamela
Manitoba Infrastructure and Transportation
Manitoba Municipalities, Association of
Martin, Brian
McBride, Village of
McLaughlin, Gary M.
Michaud, Suzanne
Montmagny, Ville de
Morris, Bruce
Munsey, J.F.
New Brunswick Department of Transportation
North, Kevin A.
North Vancouver, District of
Northumberland County, Ontario
Northwest Territories – Department of Transportation
Nova Scotia – Transportation and Public Works
Ofukany, Jerry
Ontario Good Roads Association
Ontario Ministry of Transportation
Owen, Lynne
Parker, Phyllis R.
Paul, Dan
Pearce, Blake
Petrescu, Michael
Phillips, Hugh

Primoris Associates Inc.
Professionals for Rail Safety Accountability Inc.
Québec Gatineau Railway Inc.
Quebec, Government of
  Ministère des Transports
  Ministère du Développement durable, de l'Environnement et des Parcs
Railway Association of Canada (RAC)
Rawliuk, Gordon
Rivers, Town of
Salaberry-de-Valleyfield, Ville de
Salisbury, Village of
Saskatchewan Highways and Transportation
Shporer, Ronnie
Siddall, Kate
Smart Rail
Smith, Sean
Smyth, Bill
Spicer, Donna
Stephens, R.D.
Strathcona County, Alberta
Strathcona District Mutual Assistance Program
Strathcona Industrial Association (SIA)
Surrey's United Naturists (SUN)
Teamsters Canada Rail Conference, Alberta Legislative Board
Teamsters Canada Rail Conference, Division 320
  Murray Douglas
  Eric Ladan
  Richard Newell
  Gerry Ranson
Teamsters Canada Rail Conference, Division 583
  Tom Safruik
Teamsters Canada Rail Conference, Division 898
  Brian Nesbitt
Teamsters Canada Rail Conference, Division 945
Teamsters Canada Rail Conference – Maintenance of Way Employees
Teamsters Canada Rail Conference – Manitoba Legislative Board
Teamsters Canada Rail Conference – National Legislative Board
Teamsters Canada Rail Conference – New Brunswick Legislative Board
Teamsters Canada Rail Conference – Ontario Legislative Board
Teamsters Canada Rail Conference – Rail Traffic Controllers
Teamsters Canada Rail Conference – Saskatchewan Legislative Board
Torre, Cecile

Transport 2000 Canada
Transportation Safety Board of Canada
Transtronic Inc./CPCS Technologies Corporation
Ultramar Ltée
United Steelworkers
United Transportation Union, General Committee of Adjustment GO-129, Western Canada
United Transportation Union, Local 1778
Van Huizen, Gerald
Venance Rail Inc.
VIA Rail Canada
View Royal, Town of
Whyte, Kasha
Willment, Steven
Wilson, Derek
Wright, John

APPENDIX H

GLOSSARY OF ACRONYMS

AAR	Association of American Railroads
AMP	Administrative Monetary Penalty
BLE	Brotherhood of Locomotive Engineers
CAMA	Canadian Association of Municipal Administrators
CANALERT '95	*Alertness Assurance in the Canadian Railways* study
CANUTEC	Canadian Transport Emergency Centre
CARAC	Canadian Aviation Regulation Advisory Council
CAW-TCA	[formerly, Canadian Auto Workers]
CCPA	Canadian Chemical Producers' Association
CEPA	*Canadian Environmental Protection Act*
CIFFC	Canadian Interagency Forest Fire Centre
CLC	*Canada Labour Code*
CLC-II	*Canada Labour Code* Part II
CMA	*Canada Marine Act*
CMAC	Canadian Marine Advisory Council
CN	Canadian National Railway
COF	Certificate of Fitness
CP	Canadian Pacific Railway
CROR	Canadian Rail Operating Rules
CTA	Canadian Transportation Agency
EOC	Emergency Operations Centre
EPA	Environmental Protection Act (U.S.)
ERAP	Emergency Response Assistance Plan

FCM	Federation of Canadian Municipalities
FPWGRS	Federal-Provincial Working Group on Railway Safety
FRA	Federal Railroad Administration
GIC	Governor in Council
GCIP	Grade Crossing Improvement Program
HRSDC	Human Resources and Social Development Canada
ICS	Incident Command System
MOU	Memorandum of Understanding
NTSB	National Transportation Safety Board (U.S.)
PPSC	Policy and Planning Support Committee
RAC	Railway Association of Canada
R&D	Research and Development
REET	Regional Environmental Emergency Team
RIAS	Regulatory Impact Analysis Statement
ROC	Rail Operating Certificate
RSA	*Railway Safety Act*
RSAC	Railroad Safety Advisory Council (U.S.)
RSCC	Railway Safety Consultative Committee
RSI	Railway safety inspector
RSIG	Rail Safety Integrated Gateway
RSSB	Rail Safety and Standards Board (U.K.)
RTC	Rail Traffic Controller
RTD 10	Technical Standards and Inspection, Testing and Maintenance Requirements
SMS	Safety Management System
TATC	Transportation Appeal Tribunal of Canada
TC	Transport Canada

TCRC	Teamsters Canada Rail Conference
TDC	Transportation Development Centre (Transport Canada)
TDG	Transportation of Dangerous Goods
TDG Act	*Transportation of Dangerous Goods Act*
TDG Directorate	Transport Dangerous Good Directorate (Transport Canada)
TrAM	Train Area Marshalling
TransCAER	Transportation Community Awareness and Emergency Response
TSB	Transportation Safety Board of Canada
TTC	Transportation Technology Center (U.S.)
UC	Unified Command
UTU	United Transportation Union

APPENDIX I

RAILWAY SAFETY ACT REVIEW SECRETARIAT

Executive Director
Tim Meisner

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