Regulatory Requirements for Dangerous Goods Transportation Emergency Planning Resulting from the Mississauga Accident

Notes of an address to be given by

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Introduction

The railway accident at Mississauga, Ontario was a major social and safety trauma for Canada. Accidents involving dangerous goods in transport had taken place before, and indeed still occur from time to time. Mississauga, however was and still is unique: up to three hundred thousand citizens of Mississauga and its neighbouring municipalities were evacuated from their homes for varying periods of time up to 5 days. Businesses, schools, and hospitals in the area were all closed and the incendary at the derailment was fought, through the electronic communication media, in the livingrooms of every home in the country. Television, more than anything else established in the minds of every Canadian, the awesome risks and potentials for danger and damage, from the transportation of dangerous goods.

After the accident response was concluded, after the rail services were re-opened, after people were returned to their homes and the schools, businesses and hospitals had been re-opened. the formal and informal examination and assessment period commenced. Could such an accident happen again? - the answer was yes; what were the probabilities of another accident? - the answer was as low as one billion to one and as high as one hundred million to one, but while such probabilities could be calculated, how relevant were they? and would any statistics make people feel more at ease? - the answers were both no; what could be done to reduce the probabilities? - the answer was many things - but the question remained - which would be the most effective? could we as a Nation afford the solutions? - the answer was clearly that we could not afford all of them; was the legislation in place sufficiently powerful and comprehensive to handle the probability of such an accident and the probable consequences? - the answer was by and large yes but some amendments might be desirable.

Background

Before proceeding, it might be desirable to have some broad general idea about our transport situation in Canada. Canada is an industrial nation in the primary and secondary industrial sense, with a relatively small population for the

very large land area of the country. It has also one other significant characteristic - most of our resources or products are in areas distant from their markets whether domestic or export. Hence our reliance on an extensive transportation system intended to move large quantities of products over long distances efficiently and cheaply. Our road and railway network in terms of kilometers per capita is extremely high on a world comparitive basis. Our trucks and railcars are some of the heaviest and largest in the world in order to offer economies of scale in transportation necessary to compensate for the excessive distances our products must travel. Trains, in particular are often pulled by 5 or more locomotives, even on flat lands, and the longest trains are nearly two kilometers in length.

Canada is also a major producer and user of dangerous goods and has a considerable foreign trade in these products. We need for our domestic industrial purposes hydrocarbon products and inorganic chemicals. We export large quantities of basic chemical products - mainly hydrocarbons. We import in return, mainly from the United States of America, a smaller total volume of secondary or speciality chemical products. We are largely self sufficient or net exporters of other products such as explosives and compressed gases.

Regulatory Powers

Canada's regulatory initiatives and powers have evolved over the years. In the past, safety in the transportation of dangerous goods had been obtained by a series of discrete and narrowly focussed federal and provincial statutes dealing with individual modes of transport or with individual products or groups of products. Where the Acts dealt with a single mode of transport (such as the Canada Shipping Act, the Railways Act, the Aeronautics Act or the provincial highway traffic Acts) the Acts dealt with the mode comprehensively but with the transport of dangerous goods only peripherally. Where the Acts dealt with products of groups of products (such as the federal Explosives Act or for example, the Ontario provincial Gasoline Handling Act) the Acts dealt with the product comprehensively (i.e. from all aspects of manufacture or importation through all phases of the commercial cycle to use or disposal of that product or group of products) but with the transportation of that product or group of products only peripherally.

In response to a review of broad policy issues in the transport field the Government of Canada and the Provinces considered in the mid 1970's that it would be desirable to treat the subject of dangerous goods in transport in a more comprehensive manner. It recognized that while the manufacturing, storage and use of products that are dangerous goods should be and was adequately regulated by specially focussed legislation that would set the parameters for the appearance of such products in the economy and society, the transportation legislation should specifically reinforce and link up with the "before-transport" and "after-transport" legislation already existing or perhaps planned. The new dangerous goods transport legislation should however ensure that certain things were done by and responsibilities set out for people other than the carriers if safety in transportation was to be achieved - a failing in the existing modally-oriented legislation that would be replaced. Finally the new comprehensive legislation had to take into account the constitutional division of authority and responsibility between the federal and provincial governments to make sure that each level of government could and should continue to play its proper role.

A new Act, the Transportation of Dangerous Goods Act, was prepared in conjunction with the provincial governments. It was first presented to Parliament more than a year before the Mississauga Accident took place. That legislation contained provisions that:

1. made it apply not only to carriers of dangerous goods but also to shippers and consignees and to those who manufacture and sell the packagings, containers and vehicles in which dangerous goods may be packed or loaded;

2. allowed for improved response to dangerous goods emergencies by setting out extra-ordinary, but specific powers of inspectors that could be used only during the course of "a serious and imminent danger to --- life, health, property or the environment";

3. introduced sufficiently strong penalties and a means of allocating responsibilities between the employees, employers and corporations to ensure compliance; and

4. allowed special emergency powers for use to prohibit or designate the manner in which activities that are not regulated by the Act and that are considered to be a threat to public safety should take place.

The legislation was already under review by Parliament when a special Inquiry was established to look into the Mississauga Accident. In an unusual action, the Minister of Transport asked the Commissioner of the Inquiry to advise him in a preliminary way, if the Inquiry to date had shown or implied any weakness in the provisions of the proposed new legislation.

Recommended Adjustments to Statute

Mr. Justice Grange, the Commissioner, recommended that, if amendments could be made, four changes in particular should be introduced:

1) to require that persons and companies engaged in dangerous goods activities should report that activity;

2) to provide for the requirement to train employees in their special duties respecting dangerous goods;

3) to provide more precise authority to deal with safety standards for the "design, construction, equipping, functionning or performance of..." vehicles containing dangerous goods; and

4) to ensure appropriate powers were available for inspectors to take remedial measures at the site of any accident.

Each of these changes were adopted by Parliament and are included in the Transportation of Dangerous Goods Act now in force.

Recommended Adjustments to Regulatory Program

The real and detailed impact of the Government's action lies in the regulations under the Act and the supporting program of the government agencies involved in its implementation. Following completion of the Inquiry by Mr. Justice Grange, he included in his report a number of specific recommendations for further actions. Those recommendations which respected emergency planning or response and the Commissioner's Comments, if any, on his recommendations were:

1. RECOMMENDATION FOUR

As a condition of shipment anywhere in Canada of dangerous goods by rail, the shipper should have in effect a plan for control of the escape of his product in an accident and that plan should be submitted to and approved by the Minister or such agency or person as he may designate. The right to ship may be revoked at any time the plan, either in concept or operation, is deemed inadequate.

COMMENT

This recommendation which is basic to the reliance upon the private sector will take a little time to implement but I do not intend that the implementation be long delayed. Most of the shippers already have plans in effect and I should think all shippers could submit their plans within three months. The nature of the plans will, of course, vary with the product and the response may, by arrangement, be made by others than the shippers themselves. The important thing however is that the plan be in place and be acceptable. Nothing should be shipped unless we are able to deal with its escape. If private industry cannot do it, then the government must supply the protection, something government at this time is quite unable to do. What government must do is examine the plan critically and keep it under constant surveillance.

The power to implement this recommendation seems clear from the Transportation of Dangerous Goods Act, s. 21 giving the Governor in Council power to make regulations in s-s. (i) and (k) thereof as follows:

> "(i) prescribing circumstances in which the handling, offering for transport or transporting of dangerous goods is prohibited;"
>
> "(k) prescribing safety marks, safety requirements and safety standards of general or particular application."

Section 17 of the Transportation of Dangerous Goods Act ... provides in effect that an inspector may "request" the shipper to put the plan into effect. Although s. 14(5) makes the failure to comply with a reasonable request an offence, I would have preferred the use of the more imperative word "require".

2. RECOMMENDATION FIVE

Transport Canada should make available through CANUTEC* or otherwise the advice and direction needed upon a rail accident involving dangerous goods. In particular it should make available at the scene of, and within hours of, an accident, a person capable of directing the clean-up of that accident and of protecting the populace. He will lend all assistance to the local or provincial authorities and will take charge of the scene if no such authorities are evident. This person, no doubt an inspector under the Transportation of Dangerous Goods Act, should report in writing after every accident to which he is summoned.

COMMENT

This, as I see it, is the major contribution by the Federal Government to the response to an accident, but it is no more than would be expected. The importance of the training of the federal representative at the scene cannot be overemphasized and there must be an adequate number of such representatives so distributed that any part of the country covered by rail will be able to obtain their assistance in person within a few hours. The 24-hour telephone number of CANUTEC should be in every police and fire station in the land and Transport Canada should prepare and provide to local emergency forces educational programmes in response to a dangerous goods spill.

RECOMMENDATION SIX

The railways should be required either by the CTC** or by Transport Canada as appropriate to take action forthwith as follows:

a) to publish to Transport Canada and any private or public response agencies their response plans which will include a 24-hour emergency telephone number where information as to the contents of trains may be obtained;

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*CANUTEC - The 24 hour-a-day emergency response centre for dangerous goods operated by Transport Canada.

**CTC means Canadian Transport Commission which is the regulatory agency for railway safety.

b) to have available on all dangerous goods trains and at all division offices an accurate intelligible consist* containing at least the car number and the name of the dangerous commodity carried and to provide such consist to CANUTEC and to any municipal or provincial official forthwith on request, whether or not there has been an accident; the railways should also provide municipalities or communities having response personnel with information on the types of dangerous goods normally transported through them.

4. RECOMMENDATION TEN

The CTC or Transport Canada should require shippers and carriers to replace all present dangerous goods placards with ones as nearly as possible impervious to fire and weather conditions.

5. RECOMMENDATION ELEVEN

Transport Canada should forthwith establish a permanent body to consider with research assistance -

a) the means of measurement of the amount of product remaining after a spill;

b) the means of determining the risk posed by an escaping product;

c) the colour-coding of dangerous goods tank cars;

d) the raising of the numbers of other means of clear identification of the numbers of tank cars;

e) the raising of the numbers of other means of clear indentification of the numbers of tank cars;

f) the marshalling of a dangerous goods train;

g) the re-routing of dangerous goods trains around urban areas.

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*consist is a railway term meaning a train's cargo manifest

COMMENT

I can only regret that I am here doing what I have complained of in others, i.e. making recommendations for further study.. The matters listed are, however, real problems to which I do not have the answers. I can only hope that these answers will be forthcoming shortly and where the answers dictate affirmative action that such action will be taken immediately.

Response to the Recommendations

Upon receipt of the Report on the Railway Accident at Mississauga, the Minister of Transport established a small and very senior level advisory committee to assist him in deciding upon the disposition of the recommendations included in the Report. In principle all were accepted by the Government as having merit, but it was pointed out that their implementation could take time or might be difficult to achieve due to costs or to the necessity to involve other levels of government. It was also decided to accept them in the context of any mode of transport (where relevant) rather than just for rail transport.

Examination of the recommendation regarding the mandatory filing of contingency plans for dangerous goods prior to shipment took into account the following factors:

1. there existed already CANUTEC, Transport Canada's 24 hour emergency information centre for dangerous goods;

2. different dangerous goods consignments pose varying risks: butane lighters in boxes are not as dangerous as butane tank cars, but small quantities of fissile radioactive materials are more dangerous than large quantities of yellow-cake (uranium oxide);

3. emergency response forces across the country generally know how to deal with a wide range of flammable materials;

4. risks to the populations have to be considered in terms of both immediate off-the-right-of-way dangers as well as the longer term although the latter risk is less important for the immediate reaction of the contingency plan.

5. individual companies often belong to industrial associations which might form (and indeed have formed) mutual self-help groups;

6. the industrial groups and individual companies here, in Canada, demonstrate a strong social responsibility to do whatever needs to be done to provide public safety.

As a result, the regulations dealing with this subject that have been published,

1. have named 489 individual dangerous goods for which contingency plans shall be filed, under

2. one of four separated conditions, only one of which would apply to each dangerous good:

   a) for any quantity being transported;

   b) for only bulk or full vehicle or container load consignments;

   c) for consignments comprising more than 25 kg or 25 L of the dangerous good, or

   d) for consignments comprising more than 1000 kg or 1000 L of the dangerous good.

The regulations propose that a plan should be filed by consignors of such consignments where the consignor is in Canada and, in the case of imports, the consignee who presumably has caused the dangerous goods to enter the Canadian transport system. In addition the carrier must file a response plan as a transporter and where the carrier is transporting the goods into Canada he must have proof that the consignee has filed such a plan.

Plans must include information respecting:

1. the name and address of the consignor or carrier;

2. the name and address of any agent named under Subsection 19(2) of the Act (for non-resident shippers);

3. the name and address of each person on whose behalf the plan is filed (e.g. a National Association filing a common plan for all its membership or an emergency response contractor for an individual shipper);

4. a description of the emergency response capability of the person filing the plan;

5. the means of activating the plan; and

6. the name, address and telephone number of the person filing the plan.

It is intended that the plans will be assessed by special inspectors to satisfy the Government's desire for comprehensiveness and practicability of the plan. Plans will be registered on satisfaction and that registration number should appear on any consignment documentation for which the plan is relevant. These plans would be triggered by CANUTEC on notification that an emergency was taking place.

Commissioner Grange's fifth recommendation, as his comment points out, recognizes that notwithstanding the good corporate - citizen's attitude of Canada's dangerous goods shipper industry and the best efforts of its carriers, very often the site of the accident is frequently some hours travel away from the shipper or consignee both of whom are presumed to have a competence to provide expert assistance and who may also have a legal responsibility to do so. In response to this recommendation and recognizing that the principal responsible for emergency response is a provincial one, the federal government has entered into the first of a number of expected arrangements with national industrial associations to establish emergency assistance teams throughout the country that could be called upon if needed. When that call is made, the government will assume the financial responsibility for the costs incurred until the shipper of the goods can arrive at the site and take over his natural responsibilities. There is provision in the Act though for these costs to be recovered from the person who owned the goods, or who had charge, management or control of them at the time the accident occurred or any person who may have caused or contributed to the causation of the accident.

The Mississauga Accident Inquiry determined that the procedures for the railway companies for responding to emergencies were not well known by the public (municipal and provincial) emergency response agency. Commissioner Grange dealt with this issue in his sixth recommendation which has been almost fully implemented without the need for regulatory intervention. The railway companies embarked on a major public relations program that established a liaison between their emergency response and control centres and the agencies in every municipality through which they operate intended to ensure the most immediate establishment of contact between the railway company and the municipality whenever the need might arise. In addition, the documentation on the trains respecting the dangerous cargos has been considerably improved both in quality of documentation (legibility etc.) and in its nature. Any regulatory requirements in this area will be post facto for the railway mode, but will encompass the other modes of transport where the present experience may be judged less satisfactory. The "advance planning" implicit in meeting these regulations has enbabled the municipal agencies to better prepare themselves for certain eventualities in terms of training of their personnel, purchase of equipment and in identification of sources of "antidote or counter measure" chemicals that could be useful.

Grange's recommendation ten and parts of eleven ((c), (d) and (e)) should really be considered together since they relate primarily to improving the means of identifying the product present. For better certainty there are several parallel but alternative sources of information to response forces who must find out what the product is before they can respond. The first and by far the most important is the shipping document (or cargo manifest) - these are however subject to technological advances and are often non-existant (despite regulations requiring them) having been replaced by computer messages or simply telex messages. A second method is the placard - a 250 mm by 250 mm or greater sign attached to all four sides of the vehicle that is colour-coded, has various symbols and words or numbers that show the hazard class and often the identification number of the specific product being transported. Mr. Grange noted that the quality of those placards has not been very good. His specific recommendation for fire-proofness has not been accepted because the socio-economic impact analysis did not show the benefits were sufficient to outweigh the costs. The

placards are, however, being markedly improved by regulations requiring that they be retro-reflective - something the fire forces prefer because of the night-time and long distance visibility.

The third method of identifying the contents of the vehicle is to trace the owner (and from him if necessary, the user) from its registration numbers. These numbers are often painted on the sides of the vehicles and has, on review been found to be sufficient. Consequently the recommendation to physically raise the numbers was not accepted.

Because the placards are to be retro-reflective, the recommendation to colour-code the cars carrying dangerous goods also was not accepted. To do so would in any case have introduced problems from the point of view of conflicts with company colour schemes and the use of the same vehicle to transport alternately dangerous and non-dangerous goods.

With respect to the remaining portions of the Eleventh Recommendation research is underway. A special program is established to find simple indicators of the remaining contents of tank vehicles - but the need for accuracy, robustness and cheapness seems to be limiting success. There is continuing research going on in Canada to record accident experience and assess the risks produced by escaping products. Here, we are aware of research in the USA and Europe that involves not only conventional chemical reaction analysis - but also computer modelling to predict spill areas, vapour cloud dispersion etc. As this research is continuous, the data banks of information are updated.

Some improvements have been made to train marshalling rules, but the placement of cars carrying dangerous goods in the train and their separation one from the other is problematic in as much as almost no two derailments or accidents are similar - hence a change to solve one problem may create another in a different circumstance.

Finally, the question of re-routing trains around urban areas has been addressed and has been largely rejected as a solution due to the direct costs of rail-line relocation and the need to continue to service industries in the cities themselves. In some cases partial re-routings have been made, but the preferred approach is to control better the risk of accidents - hence rail line quality is being

improved, rail crossings and switches are being eliminated, train inspections are being held more frequently and at the gateway to all large towns and finally train speeds are being reduced. For the highway mode of transport, dangerous goods truck routes are being established - indeed a special traffic sign has been adopted for this purpose - and time of day restrictions are being also introduced for access by some dangerous goods vehicles in the downtown cores.

In addition to these regulatory initiatives, the governments concerned are also stepping up their inspection and publicity activities to ensure compliance and are revising their other supporting activities of training, public awareness and emergency response assocations.

Conclusion

In closing, I should point out that none of the activities that have resulted from the analysis of the Mississauga Accident can be claimed to be radical. All of them are based upon strengthening the natural willingness of our citizens - corporate, public and private - to act in a responsible manner. All of them too can be seen to be logical extensions or improvements to requirements or activities already taking place but which were found in Mississauga to be inadequate in the ultimate test.