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We welcome news, comments or highlights of transportation of dangerous goods activities, announcements of meetings, conferences or workshops. The Newsletter carries signed articles from various sources. Such articles do not necessarily represent the views of the Directorate, nor does publishing them imply any endorsement. Material from the **Newsletter** may be used freely with customary credit.

Potential TDG Act Amendments:

The Newsletter will publish a special edition covering this topic should a Bill be introduced in Parliament to amend the *TDG Act, 1992.*



Editorial

Welcome to the Spring 2007 edition of the newsletter.

I hope you will enjoy reading the many articles we have included in this issue. The feature article on page 4 covers the topic of railroad tank cars and the requirement to increase the safety and cost-effectiveness of rail tank cars used for the bulk transport of dangerous goods. As well, there is important information on page 7 concerning the registration of tank car facilities with Transport Canada.

As you will see on page 9, the TDG Congress III will be held this year on October 15th and 16th at the Marriott Hotel in Ottawa. I invite you to visit the TDG website at the following address: www.tc.gc.ca/tdg/menu.htm for more information.

Finally, this is the last reminder that we are updating the mailing list and your cooperation is greatly appreciated. As always, I invite you to send me your comments and suggestions. I look forward to hearing from our readers.

Enjoy your reading!

Renée Major

New Valve Protection Requirements for Gas Cylinders Manufactured On or After October 1, 2007

by Pascal Verville

Gas cylinder users and owners are reminded that new valve protection requirements apply to cylinders manufactured on or after October 1, 2007. The new provisions require that the means of protection protect the valve from leakage resulting from a 1.2-metre drop onto a solid concrete surface. This performance-oriented approach to valve protection is consistent with requirements adopted for cylinders by the UN Committee of Experts on the Transport of Dangerous Goods and provides increased assurance that valves will be protected from falls incidental to handling in transportation. The particulars of the testing procedure and acceptance criteria for cylinder valve protection are set forth in clause 4.2.2.3 of National Standard of Canada CAN/CSA-B340-02, "Selection and Use of Cylinders, Spheres, Tubes, and Other Containers for the Transportation of Dangerous Goods, Class 2". This standard, including the January 2004 and February 2005 amendments, was adopted into the *Transportation of Dangerous Goods (TDG) Regulations* on July 13, 2005.

Means of cylinder valve protection, including protective devices such as caps or guards, outer packaging, and inherent valve protection (valves having sufficient strength to withstand impacts in their own right), having passed the specified drop test must be certified and **marked** accordingly by the user or manufacturer of the means of protection.

Although the CSA B340-02 standard does not specify a marking format for cylinder valve means of protection, markings must effectively indicate compliance with the requirements of the prescribed performance test. In addition, the markings must indicate or be traceable to the maximum gross mass for which the means of protection is qualified and the certifier of the means of protection. The CSA Technical Committee on Cylinders, Spheres, and Tubes for the Transportation of Dangerous Goods continues its work on developing a marking format for inclusion as an informative annex to the 2007 edition of CSA B340 which is expected to be published shortly.

For means of valve protection that are integral to the cylinder design, the cylinder's specification markings applied by the cylinder manufacturer suffice to indicate compliance. Means of valve protection that are considered integral to the cylinder design include valve-protection rings (collars) attached by welding or brazing and valves that are recessed into the cylinder.

We are continuing to update the TDG Newsletter mailing list and would like your cooperation in doing so. If you wish to continue receiving the Newsletter and there is an asterisk (*) beside your name on the envelope, please complete the enclosed "Confirmation of Address" card and return the pre-paid, self-addressed card, at your earliest convenience.

If you would like to reduce the paper copies and replace them by an e-mail notification when the new issue is available on-line, please mark the "e-mail notification" box on the reply card.

PLEASE NOTE: This is the last reminder to update the mailing list. If there is an asterisk (*) beside your name on the envelope, you have not completed the enclosed card and your name will be automatically removed from the mailing list for the next issue of the Newsletter.

Your cooperation is greatly appreciated.

Thank you.

FEATURE

Improving The Accident Survivability Of Railroad Tank Cars

by Jean-Pierre Gagnon

Railroad tank cars have been used for the transportation of dangerous goods since the beginning of the last century. Unfortunately, tank cars occasionally get involved in derailments and sometimes get damaged to the extent that part or all of their dangerous goods contents are released.



"Tests such as this one performed around 1980 led to the development of tank car head shields and shelf couplers. Further similar research and testing this year should lead to further enhancements."

Historically, major changes to the regulatory requirements have often followed from high profile accidents as a result of exhaustive investigations following which changes to the equipment is mandated or the level of safety is otherwise increased.

Without listing all the famous North American accidents that have triggered or are triggering regulatory changes, one only has to think of Mississauga in 1979 in Canada and more recently Minot, ND, Macdona, Texas, and Graniteville, SC, in the U.S. as powerful drivers for safety changes. In the Minot accident, several tank cars lost their loads of anhydrous ammonia. In each of the other three accidents, a tank car of chlorine gas was punctured and lost most of its load with resulting injuries and fatalities due to gas exposure in Macdona and Graniteville.

The specifications for the design and construction, and the requirements for the maintenance, periodic qualification and use of tank cars for dangerous goods are found in Standard CAN/CGSB-43.147-2002 adopted by reference in the *TDG Regulations*. Equivalent regulatory requirements are found in the U.S. in the *Code of Federal Regulations (CFR) Title 49*. The regulating bodies for these matters are Transport Canada (TC) and the Department of Transportation (DOT) in the U.S.

The government requirements are complemented by detailed requirements found in *Standards and Recommended Practices* issued by the Association of American Railroads (AAR), in particular their specification for tank cars. This industry association's tank car committee has recognized expertise and delegated authorities from TC and DOT and they are still relied upon to administer tank car design reviews, service equipment (valves) approvals and recommend regulatory changes.

Rail tank cars are constructed to various specifications and materials. They have historically been categorized in two groups, those that transport liquids with little or no pressure (non-pressure tank cars) and those that transport pressurized gases in the liquid state (pressure tank cars). The majority of non-pressure tank cars conform to Class 111 while for pressure tank cars the majority conform to classes 105 or 112.

All these tanks cars are characterized by a test pressure with values of either 60 or 100 psi for the non-pressure category and either 200, 300, 340, 400, 500 or a maximum of 600 psi for the pressure category. As a general rule, the thickness of the tank increases with the test pressure and hence its resistance to perforation. This is a simplification as other factors such as diameter and the steel specification affect this but is a good rule of thumb for this discussion. A large number of tank cars are insulated on the outside, in which case the insulation is covered by a steel jacket that provides additional protection to the tank in case of accidents.

The requirements in CGSB-43.147 establish the minimum safety requirements for selecting a tank car for any given dangerous goods. Some products have a high vapour pressure and require a tank car that can withstand such a higher pressure, resulting in a thicker tank. If test pressure of a tank is taken as a parameter for tank integrity, it can easily be understood that low hazard dangerous goods can be transported in all pressure and non-pressure tank cars. For example, fuel oil can be transported in tank cars of all test pressures. For anhydrous ammonia and propane, the minimum test pressure is 340. For liquids that are toxic by inhalation (TIH) it is 300, and for chlorine gas it is 500. The use of a tank car of superior integrity than the minimum is always authorized and the term “overpackaging” is often used to describe this situation.

Most dangerous goods means of containment are designed and tested to withstand normal conditions of transport. This is also true for railway tank cars. In addition, tank cars used for the transportation of class 2 gases have additional features for protection during accidents. For example, valves on pressure tank cars are grouped together at the top centre of the tank car and surrounded by a thick steel protective housing (sometimes erroneously referred to as a “dome”). Pressure tank cars with test pressures below 500 are also equipped with 0.5 inch (1.27cm) thick steel shields covering the ends. Pressure tank cars are also equipped with thermal protection on their external surface, that is a fire resistant insulation usually covered by a steel jacket and designed to prevent or, at least, significantly delay rupture of the tank when engulfed in fire.

This preamble should help one understand that there are various tank cars with different inherent levels of structural integrity and that some have extra protection specifically designed for accident protection. Given a particular dangerous goods, the regulation (CGSB-43.147) will assign a minimum tank car specification (and test pressure) commensurate with the level of danger associated with the dangerous goods.

Tank cars are not indestructible, and even the most sturdy (600 psi test pressure) could fail and release some of its contents given an accident with the appropriate severity. The three recent U.S. accidents mentioned earlier illustrated that anhydrous ammonia tank cars (340 psi test pressure) and chlorine tank cars (500 psi test pressure) can be punctured and lose their contents during an accident. Without going into the details, the Minot accident also raised issues and concerns about the properties of older steels (pre 1989) and their resistance to fracture under very cold temperature conditions.

A serious review of the circumstances surrounding these accidents raises questions about the inherent level of safety or risk of failure of tank cars in such accident situations and whether TC and DOT should mandate tank cars with even higher accident survivability. The recent history of the *TDG Regulations* (since Mississauga) has been one where the level of safety has been regularly raised. For example, the minimum tank car test pressure for TIH liquids and some halogenated liquids has recently been raised from 100 to 300 psi.

For instance, it has been suggested that we could require a minimum 500 psi test pressure tank car for anhydrous ammonia (from 340) and 600 (from 500) together with head protection (0.5 inch (1.27cm) steel shield) for chlorine. Such an approach is, however, shortsighted as it is not all encompassing. If we consider raising the minimum test pressure for these two dangerous goods, then all dangerous goods with similar hazards should be considered the same. In addition, we would also need to consider the impact of such measures on dangerous goods of higher hazards, for which the higher test pressure is already the minimum. And finally, we would need to consider the implications of such an action on the rest of the fleet of non-pressure tank cars.

The approach described above has been a traditional one, whereby adding more steel thickness to the tank with additional steel jackets and head protection is a simple way of improving puncture resistance and accident survivability. This is the “heavier is better” approach. It works well up to a limit which we are quickly approaching where the rail tank cars are so heavy that they may not be cost effective, not to mention that given gross weight limitation, increasing the light weight of the tank cars means reduced payloads and increased number of shipments which has a detrimental effect on risk.

Back in early 2006, the CEOs of major railroads decided to require a plan for tank cars carrying chlorine and anhydrous ammonia with improvements such that their probability of releasing dangerous goods in a derailment accident would be reduced by 65%. The railway CEOs mandated their AAR tank car committee to come up with a new requirement and a comprehensive implementation program. Interestingly, this industry association representing railroads acted as a regulatory body, going far beyond its role of advisor to the regulators on such matters.

The AAR published its new requirements in October 2006. They essentially are requiring a 600 psi tank car with head protection and improved valve protection for chlorine and a 500 psi tank car for anhydrous ammonia. Provisions were made for implementation for new railcars and retrofitting or phasing out the existing fleet.

This process essentially sent a message to shippers and railcar owners that shipments of those two dangerous goods would not be accepted by the railroads unless their requirements were met, regardless of existing regulations. The AAR followed the “heavier is better” approach discussed earlier with its inherent limitations.

In response to industry concerns regarding the AAR initiative, the U.S. DOT/FRA (Federal Railroad Administration) held public meetings in 2006 on tank car safety matters in which TC participated. Further meetings are also planned this year. TC also heard comments from affected parties, and in particular from the members of the CGSB-43.147 committee during a meeting which took place in February 2007 in Montréal. Many commented that the governments should take the lead in pursuing improvements to the safe transportation of dangerous goods by tank car and, while doing so, keep a holistic approach and encourage continuous improvements. AAR has since postponed the implementation date of their new requirements by one year.

Currently, a major industry initiative is underway led by the Dow Chemical Company, Union Pacific Railroad and the Union Tank Car Company and is designated as the Next Generation Tank Car Project. A major goal is a complete redesign of the current tank car used for TIH dangerous goods by looking at ways of improving every component in a manner that would achieve major improvements of the overall safety and security aspects of the tank car. As an end result, a new design or specification of tank car is likely to emerge. In order to accommodate the innovations that such a new concept will bring, a number of changes to the existing federal tank car specifications will likely be required in order to accommodate the additional flexibility required to encourage new materials, components, safety systems, testing and design approaches.

Transport Canada and the U.S. DOT/FRA support this initiative and both are now actively collaborating in this effort. A Memorandum of Cooperation has just been finalized between the governments and the three companies to formalize the terms of this collaboration.

As a short term outcome, we hope to have the results of computer simulations and tests where a few tank cars are impacted with the intent of puncturing them. This knowledge, in a first step, will be used to revise the requirements in the CGSB-43.147 Standard where the performance of safety systems is defined and the specific methods of protection are prescribed such as the installation of steel head shields. We hope to improve the performance requirements for such safety systems in addition to allowing for innovative analytical tools, designs, testing and materials.

A more long term goal will be to revise all aspects of tank car specifications where safety and security requirements are prescribed in terms of either performance or specified requirements in a manner that would allow for the use of alternative and perhaps more effective approaches. For example, rather than building thicker and heavier protective housings, valves could be redesigned with lower profiles, have enhanced safety features and their number reduced so as to achieve a decrease in their risk of failure during an accident. Similarly, the use of new elastomeric materials or other light structures to absorb crash energy such as those used in the automotive or aerospace industry could result in safety improvement levels that could not be achieved by the addition of more layers of steel alone.

**For more information on the issues discussed above, please contact
Jean-Pierre Gagnon at 613-998-5267 or by e-mail at gagnojp@tc.gc.ca**

Registration Of Tank Car Facilities With Transport Canada

by Manuel Kotchounian

The *Transportation of Dangerous Goods (TDG) Regulations* require compliance to Standard CGSB-43.147 in relation to the transport of dangerous goods in tank cars. Among the requirements of this standard is the requirement for tank car facilities operating in Canada to be registered with the Director, Regulatory Affairs Branch.

A tank car facility is an entity that manufactures, repairs, inspects, tests, qualifies, maintains, or modifies tank cars or tank car service equipment for dangerous goods transport to ensure compliance with standard CGSB 43.147 and the *TDG Regulations*. Such facilities include those that:

- Remove and replace tank car service equipment (such as valves, fittings, vacuum and pressure-relief devices and excess-flow valves) or change gaskets, including replacing pressure seals/O-rings on vacuum or pressure-relief devices, eduction pipe removal and replacement or eduction pipe gasket removal and replacement; and
- Install, qualify or repair interior linings and coatings in tank cars, when such linings and coatings are intended to protect the tank car tank against the corrosive action of the dangerous goods.

Facilities that exclusively perform the operations listed below are not considered to be tank car facilities under the standard and therefore are not required to be registered with the Director.

- a) Replacement in-kind of:
- Rupture disks in safety vents
 - Bottom outlet valve caps
 - Non-pressure hinged manway gaskets and/or fill-hole cover gaskets
 - Bottom outlet cap gaskets
 - Magnetic gauging device rods
 - O-rings in gauging device caps
 - O-rings in thermometer well housing tubes
 - Secondary plugs, chains and flanges external to valves
 - Defective eyebolts on tank cars with hinged manway cover plates;

- b) Removal and replacement of eduction pipe caps or eduction pipe blind flange gasket as part of loading or unloading operations or limited maintenance;
- c) Replacement of breather vent filters used on hydrogen peroxide tank cars; and
- d) Monitoring and restoring the vacuum in the annular space of specification 113 or AAR 204W tank cars.

Tank car facilities are also required to have a Quality Management System (QMS) which must be developed and established in accordance with the requirements of a recognized standard or series of standards. The QMS must also be registered, approved or certified by an independent organization. Recognized QMS standards include ISO 9001 as well as the Association of American Railroads (AAR) Specification for Quality Assurance M-1003.

When applying for registration as a tank car facility, an applicant must submit information demonstrating that they are familiar with the applicable regulatory requirements, and that they are capable of consistently complying with them. Transport Canada conducts on-site verifications of applicant tank car facilities as well as already registered facilities to ensure that the facilities meet all the applicable requirements of the Standard, and that their procedures meet the applicable regulatory requirements.

**For additional information,
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613-998-5267 or by e-mail at
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Report On New Requirements For IBCs

by Zenon Lewycky and Linda Hume-Sastre

In the Winter 2005-2006 edition of the Newsletter, we reported on work that the UN Sub-Committee of Experts on the Transport of Dangerous Goods (UNSCETDG) had undertaken in response to concerns over the so called "light weight" intermediate bulk containers (IBCs) made of blow-moulded inner plastic receptacle and metallic outer cage (code UN31HA1).

The UNSCETDG has now completed work on the 15th revised edition of the UN Recommendations on the

Transport of Dangerous Goods which will be published later this year. This new edition of the UN Recommendations will contain a number of changes to the requirements for IBCs.

Leakproofness Test

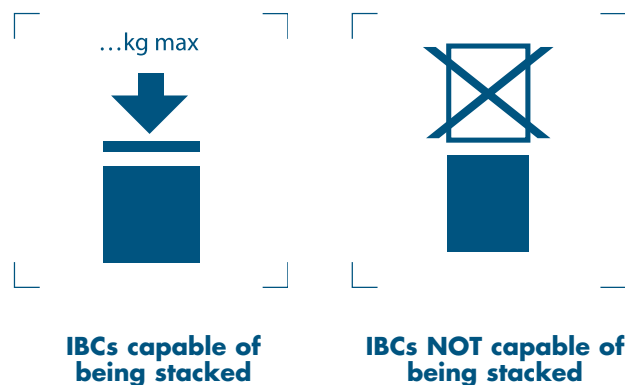
In the 15th edition of the UN Recommendations, the UN test protocol for qualifying an IBC design type will no longer permit alternative test methods to be used instead of the leakproofness test under 20 kPa of internal air pressure. Concerns had been raised that alternative tests being used were not as effective as the prescribed test, particularly in terms of exposing the entire container to internal pressure. Alternative leak tests that are as effective as the prescribed leak test will still be allowed for testing each IBC at manufacture and for periodic retesting, but these tests will have to be done with the primary bottom closure of the IBC installed.

Hydraulic Pressure Test

There has been no change to the design type hydraulic pressure test. The UN marking code on the IBC includes the hydraulic test pressure to which the IBC design must have been qualified by the manufacturer. The criteria for passing this test remains “no permanent deformation which would render the IBC unsafe for transport and no leakage” in the case of plastic and composite IBCs.

Maximum Permitted Stacking Load

Starting January 2011, the UN Recommendations will require IBCs to be marked with one of the following new symbols to indicate the maximum permitted stacking load. The UN specification code marking on the IBC will continue to include a number indicating the IBC’s stacking test load, but since this test load is 1.8 times the actual maximum stacking load in service, the display of the new stacking symbol is expected to reduce errors in calculating the maximum stacking load by conveying this information directly and without need for calculation.



Drop Test

In the 15th edition of the UN Recommendations, an additional acceptance criterion for the design type drop test will be required for all IBC types. This new criterion stipulates that after the drop test, in addition to not leaking, the drop tested IBC must have “no damage which renders the IBC unsafe to be transported for salvage or disposal...” and “the (tested) IBC shall be capable of being lifted by an appropriate means until clear of the floor for five minutes.”

Vibration Test

The 15th revised edition of the UN Recommendations will, for the first time, include a vibration test for qualifying IBC design types used for liquids. The UN Recommendations will require the vibration test for IBC design types manufactured after 2010.

Similar to the existing practice in Canada under the CAN/CGSB 43.146 Standard, the UN vibration test can be done on an additional test IBC and need not be part of the design type test sequence. The UN has prescribed a vibration test method slightly different from that of the ASTM D999 Method 1 required by CAN/CGSB 43.146 but the testing previously done according to the D999 completely satisfies the new UN Recommendations.

The *TDG Regulations* in Canada require that IBCs used to transport dangerous goods be in compliance with the requirements in CAN/CGSB 43.146-2002 Standard. In preparing the next revision of this Standard, the CGSB committee will consider all the changes in the UN Recommendations and will implement them as appropriate.

Impact of Changes to the UN Recommendations

Given that vibration testing is already done for Canadian approved IBCs, as is the 20 kPa design type leak test with internal air pressure, we do not anticipate any difficulties for Canadian IBC manufacturers in accommodating changes in the UN Recommendations. We do, however, anticipate that the changes in the UN Recommendations will lead to an increase in the quality of IBCs manufactured elsewhere and imported for use in Canada, particularly in the case of the “light weight” plastic/metal composite IBC’s.

As indicated in our original article on this matter, the Canadian *TDG Regulations* recognize for use in Canada UN IBCs approved by other countries if the IBCs are in compliance with the UN Recommendations and with the national regulations of the country of manufacture. Any prospective Canadian user or purchaser of IBCs should consider verifying that the IBCs are in compliance before using them in Canada.

TDG Congress III

October 15 - 16, 2007, Ottawa



The Canadian Chemical Producers' Association (CCPA) and Transport Canada in conjunction with the Multi-Association Committee on TDG (MACTDG) will be holding TDG Congress III from October 15 to 16, 2007, Ottawa Marriott Hotel. The program theme is harmonization of dangerous goods/hazardous materials legislation that affects transportation within Canada, the North American continent and the world. The purpose of the congress is to provide inexpensive yet comprehensive awareness information to a broad sector of affected industries.

Transport Canada senior and technical staff along with acknowledged experts from Canada, the United States as well as Europe will be on hand throughout the two days to make presentations and answer questions at plenary or workshop sessions on: Canadian Federal and Provincial TDG Harmonization (regulations, inspections, etc.); Canadian TDG and US HazMat Harmonization (classifications, cross-border, security); and Global Harmonization (Globally Harmonized System of Classification and Labelling of Chemicals, TDG, WHMIS, etc.). Translation services will be provided. Details regarding TDG Congress III will be posted on both CCPA's (www.ccpa.ca) and TC (www.tc.gc.ca/tdg/menu.htm) website as soon as they become available.

ACCIDENT SUMMARY REPORT 2006

by Lindsay Jones, Susan Williams and Jonathan Rose

A “30-Day Follow-up Report” must be completed when the quantity of dangerous goods released in an accident exceeds the amount listed in the table contained in Part 8 of the *Transportation of Dangerous Goods Regulations*.

For 2006, the Transport Dangerous Goods (TDG) Directorate estimates a total of four hundred and forty-eight (448) accident reports will be collected. This is significantly lower than the actual number of reports collected for 2005.

As of January 2007, three hundred and forty-seven (347) “30-Day Follow-up Reports” were submitted for accidents which occurred in 2006. Almost 70% (242) of these accident reports are reportable under section 8.3 of the *TDG Regulations*. This was consistent with the data collected in 2005. The remaining 30% (105) represent “30-Day Follow-up Reports” filed as voluntary accident reports as they fall outside the accident reporting requirements in the Regulations.

An additional one hundred and one (101) accidents were identified from TDG Inspector and Remedial Measures Specialists reports, newspaper clippings and other sources. Of this number, thirty-seven (37) reportable accidents are still outstanding. The remaining sixty-four (64) non-reportable accidents were added to the accident database for analysis purposes. The TDG directorate only pursues the collection of outstanding “30-Day Follow-up Reports”, with the assistance of regional inspectors who conduct follow-up investigations. Letters requesting the filing of outstanding reports are sent to companies who had charge, management or control of the dangerous goods at the time of the accidental release.

Accident reports provide the Directorate with valuable information on what took place, how the accident occurred, its severity and what response measures were taken to mitigate the event. Therefore, we encourage you to complete your “30-Day Follow-up Report” as soon as possible following an accident. The Directorate also encourages you to continue to provide voluntary accident reports because those accidents that involve minor releases may be an indicator of a much larger event. Accidents where there were no releases of product but represent an imminent threat because the means of containment suffered damage are also of great interest to us. Information from these events assists us in understanding how a means of containment performed during an accident.

When completing the “30-Day Follow-up Report”, please remember you are required to provide the Means of Containment (MOC)¹ Specification and specify the location(s) on the Means of Containment where damage(s) and/or release(s) occurred, as required under paragraph 8.3(2)(f) of the *TDG Regulations*.

For more information on how to complete your report, please contact Jonathan Rose at 613-990-1142, or by e-mail at rosej@tc.gc.ca

Below is a short selection of accidents for 2006. Every effort was made to vary this sample of accidents, as much as possible, by choosing different provinces/territories, classes of dangerous goods, modes of transport and means of containment, as well as taking into account the accident severity.

The severity level is based on the following 10 questions:

- | | |
|--|--|
| 1. Was there a compressed gas or explosive involved? | 6. Was the accident reported in the press? |
| 2. Was there a fire or explosion at the scene? | 7. Were TC personnel at the accident scene? |
| 3. Was there a dangerous goods release? | 8. Was site cleanup required? |
| 4. Was there a death, serious or multiple injuries? | 9. Was property/equipment damage greater than 65 000 \$? |
| 5. Was there an evacuation or a road closure? | 10. Was there mechanical failure of the vehicle? |

A point is assigned for each positive response to each of these questions. The sum of the points for the accidents is shown under “Severity Ranking” to represent the accident severity level. Although rare, a zero severity ranking can be assigned to an accident, indicating no positive responses to any of the questions.

¹ A “Means Of Containment” means a container or packaging, or any part of a means of transport that is or may be used to contain goods.

14/01/2006

Severity Ranking 2Hay River, Northwest Territories
Diesel Fuel

During transport, a compartmentalized **Tank Trailer and Pup (TC 306)** containing diesel fuel went off the road and overturned in a ditch. The first compartment on the lead trailer was punctured releasing 15,000 litres of product. There were no injuries. Carrier emergency response personnel were on site to contain and clean up the spill, transfer the remaining product into another tank trailer and pup, then upright and remove the overturned unit from the ditch.

05/05/2006

Severity Ranking 1St. John's, Newfoundland and Labrador
Corrosive Liquid, Acidic, Inorganic, N.O.S.

During transport in a cargo aircraft, two **boxes** containing corrosive liquid, acidic, inorganic, N.O.S. were damaged releasing eight litres of product. There were no injuries. The spill was discovered after the plane reached its destination and was being offloaded. Employees removed the leaking drum for proper disposal.

05/10/2006

Severity Ranking 2St. Peters, Nova Scotia
Resin Solution, Flammable

During loading operations by forklift, a **drum (UN1A1/Y1.8/300/06)** containing resin solution was damaged releasing 220 kilograms of product inside the trailer. There were no injuries. The spilled product was cleaned up and disposed of and the trailer was decontaminated.

22/07/2006

Severity Ranking 4Lavillette, New Brunswick
Gasoline and Diesel Fuel

During transport, an oncoming car that crossed the centre line struck a compartmentalized **Tractor Tank Trailer (MC 306)** containing 43,044 litres of gasoline and 4,051 litres of diesel fuel. Upon impact, the unit went off the road and overturned in a ditch. A fire erupted burning the entire unit and its consignment. The driver of the car sustained fatal injuries and the truck driver who received minor injuries was treated at the scene. Emergency response personnel were on site to attempt to extinguish the fire. A decision was taken to let the fire burn itself out before attempting to clear the accident scene.

17/01/2006

Severity Ranking 4Les Bergeronnes, Quebec
Ammonium Nitrate

During transport, a **tractor trailer (MC 307)** containing ammonium nitrate liquid went off the road and overturned leaking a small amount of product from a tank vent. There were no injuries. Emergency response personnel were on site to clean up the spilled product, to transfer the remaining product into another tank trailer and to upright and remove the overturned unit from the accident scene. The consignor **Emergency Response Assistance Plan was activated** during the incident.

04/06/2006

Severity Ranking 4

Charette, Quebec

Sulphuric Acid, Diesel Fuel and Gasoline

During transit, just after crossing a rail bridge, a train derailed 14 rail cars, some of which piled on top of one another. Three **Rail Tank Cars CGTX030474 (1114100W1), PROX041535 (111W100W1), CGTX030030 (111A100W1)** containing diesel fuel were damaged releasing 43,000 litres of product. One **Rail Tank Car CGTX030028 (111A100W1)** containing gasoline was also damaged releasing 1,000 litres of product. Half of the spilled diesel and gasoline entered a nearby river. Two upright **Rail Tank Cars PROX013521, PROX013516 (111A100W2)** containing sulphuric acid sustained dents with no loss of product. There were no injuries. Emergency response personnel were on site to contain and cleanup the spill and to transfer the remaining product from the damaged and leaking tank cars into other tank cars. Most of the cars were then rerailed and removed from the accident scene. The severely damaged tank cars were scrapped at the site.

21/02/2006

Severity Ranking 5

Sarnia, Ontario

Propane

During transport, while merging onto a highway, a **Tractor Tank Trailer (MC 331)** containing propane overturned sustaining minor damage. A small amount of vapour vented through the pressure relief valve. The driver suffered minor injuries and was transported to the hospital. Emergency response personnel were on site, closed the highway and evacuated a nearby business while they performed a partial product transfer into another tanker and righted and removed the overturned unit from the accident scene. The tanker was taken to a nearby facility under police and fire escort where it was completely offloaded and the residue product flared off. The consignor **Emergency Response Assistance Plan was activated** during the incident.

02/12/2006

Severity Ranking 2

Winnipeg, Manitoba

Diesel Fuel

During a rail yard inspection, a **Rail Tank Car PLMX078212 (DOT111A100W1)** containing diesel fuel was discovered leaking 2,000 litres of product from a crack in the tank shell. There were no injuries. The tank car was immediately moved to the diesel shop over drip trays and offloaded. The tank car was then taken out of circulation and set aside to be scrapped.

02/05/2006

Severity Ranking 3

Prince Albert, Saskatchewan

Anhydrous Ammonia

During temporary storage at a facility yard, a **Nurse Tank (TC 51)** containing anhydrous ammonia was discovered with a pinhole and had leaked 100 kilograms of product into the atmosphere. There were no injuries. The remaining product was pumped off and the defective tank was taken to a repair facility for further analysis.

01/03/2006

Severity Ranking 4

Killam, Alberta

Carbon Dioxide

During transfer operations between two **Tank Trailers (MC 331)**, the entire load of 8,000 litres of carbon dioxide, refrigerated liquid was released from the transfer hose when one of the units was moved before the completion of the transfer. There were no injuries. Twenty persons were evacuated from the immediate area for 30 minutes until all of the product was released and had dissipated into the environment. The incident was reported to the proper authorities.

13/06/2006

Severity Ranking 2

Chemainus, British Columbia
Diesel Fuel

During marine fuel unloading operations from a barge containing four diesel fuel **bulk tanks** into storage tanks, there was a release when the barge offloading pumps were activated in the opposite direction. There was a release of 800 litres of product on the barge and 55 litres into the water. There were no injuries. The product on the barge was contained and drained into a slop tank and the product in the water was cleaned up using absorbent pads.

24/04/2006

Severity Ranking 4

Salmo, British Columbia
Gasoline

During transport after descending a steep hill, a **Tractor Tank Trailer and Pup (B-Train) (MC 306)** containing 58,321 litres of gasoline overturned and slid sideways causing the pup to contact concrete blocks on the opposite side of the highway. The pup was punctured resulting in the loss of product, which caught on fire burning the entire truck and consignment. The driver sustained fatal injuries from the resulting fire. Emergency response personnel were on site to extinguish the fire and to clear the accident scene.

Non-Compliant Manufacture of Compressed Gas Cylinders – New Information

by Nicole Noccey

In the 2005/2006 Winter edition of the TDG Newsletter, an article was published regarding the non-compliant manufacture of paintball cylinders by Global Composites International, Inc. (GCI). It has recently been brought to our attention that the non-compliant cylinders were manufactured not only for paintball applications but also for self-contained breathing apparatus (SCBAs).

In September 2003, Global Composites International, Inc. (GCI) was granted a Permit for Equivalent Level of Safety by Transport Canada for the manufacture of composite wrapped cylinders at their San Dimas, California facility. These cylinders were designed for use in SCBAs, not paintball guns, and were to be manufactured in accordance with the design and testing requirements specified in the Permit, number SU 6146.

GCI moved their manufacturing facility to Ontario, California in April 2004 and continued manufacturing but did not provide Transport Canada with the information required to re-issue the Permit for cylinder manufacture at their new location. GCI permanently closed its business on 01 August 2005.

Please be aware that any cylinders marked TC-SU 6146 with a date of manufacture of 01 April 2004 or later would not be in compliance with the terms of the Permit and must be taken out of service. These may include, but are not limited to, cylinders used in paintball guns or self-contained breathing apparatus.

For more information, please contact Pascal Verville at vervilp@tc.gc.ca

Strengthening Canada's Regime for Rail Safety: The Review of the Railway Safety Act

by Helen Clark

In December 2006, the Honourable Lawrence Cannon, Minister of Transport, Infrastructure and Communities, announced a full review of the *Railway Safety Act*. On February 20, 2007, the Minister appointed the Honourable Doug Lewis to chair an independent Advisory Panel that will provide him with advice on the working and overall efficiency of the Act. The other members of the Panel are Mr. Pierre-André Côté, Mr. Martin Lacombe and Mr. Gary Moser. The Panel will also consider other rail safety issues, future rail safety requirements, and any matters that it feels should be brought to the Minister's attention. Minister Cannon's news release of February 20, 2007, can be accessed at <http://www.tc.gc.ca/mediaroom/releases/nat/2007/07-h029e.htm>.

The *Railway Safety Act* came into effect in January 1989. It established a regime for the regulation of railway safety in Canada, founded on the principles that railway management must be responsible and accountable for the safety of operations and that the regulator must have the power to protect public and employee safety. The Act and its associated regulations, rules and standards provides the regulatory framework for railway safety, security and some of the environmental impacts of rail operations in Canada.

The latest review of the Act was initiated to address increases in railway accidents and main-track derailments involving federally regulated railway companies since 2002. Although Transport Canada has taken significant safety enforcement action across Canada over the past few years, the Department's efforts have revealed areas where the *Railway Safety Act* may be improved. In addition, recent high-profile derailments in British Columbia, Alberta and Quebec, which led to deaths, serious injuries and significant environmental damage, have highlighted the urgency of tackling this situation in a timely manner. Serious incidents with loss of life and damage to the environment are always cause for concern.

The review will provide an opportunity to address all of these challenges by identifying possible changes to the Act that would strengthen Canada's regulatory regime for rail safety. Given changes in the railway industry and its practices since the Act was passed, including the increase in the number of federally regulated railway companies and the privatization of CN, the review will also provide

an opportunity to modernize the regulatory framework for railway safety.

As part of the *Railway Safety Act* Review, the Advisory 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., shippers and travellers), municipalities, aboriginal and environmental groups and other federal government departments and agencies. The Panel will hold public consultations across Canada, where individuals and groups can present and discuss their views in a common context. A *Railway Safety Act* Review website will accommodate input from the public. To assist those who wish to make submissions, a Consultations Guidance Document, outlining key issues of interest, will be published on the website and distributed by various means to stakeholders.

The report of the Panel is expected to be completed by the fall of 2007. The Panel will be supported by a secretariat based in Transport Canada.

More information on the *Railway Safety Act* Review is available on the website, at http://www.tc.gc.ca/tcss/RSA_Review-Examen_LSF/, or by contacting the Review Secretariat at the following address:

**180 Elgin Street, Suite 901
Ottawa, Ontario
K2P 2K3
613-998-6462**

e-mail: RailwaySafetyActReview@tc.gc.ca

Transport Dangerous Goods Research and Development Program – An Overview

by D.W. Dibble

Under Section 25 of the *Transportation of Dangerous Goods Act, 1992*, Transport Canada's Transport Dangerous Goods (TDG) Directorate has the authority to conduct research, on its own or in cooperation with partners, to promote public safety in the transportation of dangerous goods within Canada.

TDG research and development initiatives are focused on improving means of containment standards both domestically and internationally, enhancing emergency response knowledge and capabilities, advancing technical research and investigation into the development and improvement of safety marks, safety requirements, safety standards and regulations, and providing useful tools for inspectors to help promote public safety – i.e., the safety of human life and health and of property and the environment.

TDG's Research and Development (R&D) program supports Transport Canada's Vision, Mission and Strategic Goals through the provision of scientific knowledge assisting the Directorate in the development and enforcement of national policies, standards, and regulations for the transportation of dangerous goods. These promote public safety, security, efficiency and environmental sustainability of the Canadian transportation system.

Research is undertaken in collaboration with provincial and other federal government departments, international governments, universities, research organizations, industry, etc., to support, promote and conduct national and international research on transportation safety in all modes targeting the following themes:

- Safety –
 - Development of new or improved standards/regulations for dangerous goods means of containment to mitigate the consequences of accidents and to allow for harmonization of standards;
 - Development of compliance tools for TDG inspectors;
- Improve Emergency Response –
 - Development of techniques, equipment and advice to aid emergency responders in safely handling dangerous goods accidents; and,
- Security –
 - Means of containment – security and integrity.

Timely scientific information is essential to enable TDG policies, standards and regulations to be more than just words behind the law but a set of dynamic, meaningful, rational and enforceable guidelines that will promote a safe, secure, efficient and environmentally sustainable transportation system for dangerous goods.

To enhance regulatory enforcement, R&D provides the technical know-how and state-of-the-art inspection techniques to inspectors in their effort to enforce regulatory compliance and to employ remedial measures.

To support international trade and secure access to markets, Transport Dangerous Goods Directorate participates in international or bilateral research initiatives and meetings to establish internationally harmonized safety practices, guidelines and standards. This is

accomplished through the United Nations or directly with important partners such as the United States (U.S. Department of Transportation, Federal Railroad Administration (FRA)).

While Transport Canada's goal is to enhance national and international standards and regulations when transporting dangerous goods, enhancing safety without hindering trade remains an important objective. TDG led the United Nations Sub-Committee of Experts on the Transport of Dangerous Goods in reviewing testing requirements and in testing intermediate bulk containers (IBCs), which resulted in the adoption of some revisions to the Model Regulations that will enhance safety by tightening or, where necessary, clarifying the requirements for testing IBCs. Within North America, TDG participates in an annual Tank Car Research Coordination meeting to gain knowledge and understanding of present and proposed research efforts. Representatives attend this meeting from the FRA; the Association of American Railroads/Railroad Supply Institute (AAR/RSI) Railroad Tank Car Safety Research and Test Project; Transport Canada; and, various associations and companies related to the tank car industry. Cooperative tank car research is important to ensure harmonized safety standards are in place to allow the free flow of cross-border traffic.

The meetings enable the identification of projects that could be undertaken on a cooperative basis, avoiding duplication of research efforts. For example, TDG, along with FRA and AAR/RSI, are developing a tank car thermal protection fire test program to identify and quantify the effects of tank car thermal protection defects on the survivability of tank cars in a fire environment. This research stems from an extensive research program originally undertaken by TDG. These types of programs are multi-year, high level of effort projects leading to increased safety through harmonization of policies, regulations and standards.

Transport Canada recently signed a Memorandum of Cooperation (MOC) with the FRA, Dow Chemical Company, Union Pacific Railroad Company and Union Tank Car Company for the Next Generation Tank Car Project, a project initially proposed by these three companies. The overall objectives of the Project are to provide options for increasing the safety and cost-effectiveness of rail tank cars used for the bulk transport of dangerous goods through technology, research and development. The project aims to develop a better understanding of the factors contributing to tank car safety and to enhance the effectiveness of railroad specific dangerous goods bulk packaging. Specific projects relate to improved tank car safety and security and railway operations.

Other sources of R&D projects come from Transportation Safety Board rail accident recommendations; TDG Remedial Measures Specialists' and inspectors' observations/suggestions made as a result of dangerous goods accidents; and research proposals from the TDG means of containment engineers.

On April 30, 2007, Transport Canada launched *Moving Forward - Changing the safety and security culture - A strategic direction for safety and security management.*

The strategy outlines how the department will use Safety Management Systems and Security Management System, changing the way Transport Canada does business from safety and security at the operations level to a systems-wide approach. *Moving Forward - Changing the safety and security culture - A strategic direction for safety and security management* is now available on Transport Canada's Internet site at <http://www.tc.gc.ca/tcss/StrategicPlan/menu.html>.

The Basic Competency Checklist for transporting dangerous goods (TP 9554 Vol. 7) is now available on the TDG website at the following address:
<http://www.tc.gc.ca/tdg/menu.htm>

Number of Calls		<h1>CANUTEC</h1> <p>November 1, 2006 to March 31, 2007</p>	Emergency Calls by Location	
Information	3 800		<h3>Emergency Calls by Class of Dangerous Goods*</h3>	British Columbia
Regulatory	1 529	Alberta		48
Technical	4 429	Saskatchewan		11
Other	881	Manitoba		8
Total	10 639	Ontario		114
Emergency Calls	337	Quebec		70
		New Brunswick		5
		Nova Scotia		3
		Prince Edward Island		0
		Newfoundland and Labrador		7
		Yukon	0	
		Northwest Territories	0	
		Nunavut	1	
		United States	15	
		International	2	
		Class 1 - Explosives	4	
		Class 2 - Compressed Gas	82	
		Class 3 - Flammable Liquids	81	
		Class 4 - Flammable Solids	7	
		Class 5 - Oxidizers and Organic Peroxides	15	
		Class 6 - Poisonous and Infectious Substances	25	
		Class 7 - Radioactives	4	
		Class 8 - Corrosives	114	
		Class 9 - Miscellaneous	5	
		NR - Non-regulated	69	
		Mixed Load -	2	
		Unknown -	8	
		* includes primary and subsidiary classes, and possibly multiple DGs per emergency.		
Source of Emergency Calls			Emergency Calls by Transport Mode	
Shipper	6		Road	83
Carrier	67		Rail	57
Consignee	1		Air	5
Fire Department	98		Marine	2
Police Department	20		Pipeline	0
Hazmat Contractor	7		Non transport	189
Poison Control	8		Multimodal	1
Mutual Aid Group	4			
Emergency Centre	10			
Ambulance Service	2			
Medical Facility	15			
Laboratory	0			
Government	25			
Private Citizen	36			
Manufacturing Facility	5			
Distributor/Retail	2			
End User	28			
Others	2			