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TRANSPORT DANGEROUS GOODS NEWSLETTER

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INSIDE

USE OF SHIPPING NAMES NOT APPEARING IN SCHEDULE 1 OF THE *TRANSPORTATION OF DANGEROUS GOODS REGULATIONS*

BY JULIE PRESCOTT AND DAVID LAMARCHE

Under Section 2.2 (*http://www.tc.gc.ca/eng/tdg/clear-part2-339.htm#sect22*) of the *Transportation of Dangerous Goods Regulations*, the consignor is responsible for determining the classification of dangerous goods. He or she may also use a classification determined by a previous consignor or the manufacturer.

The classification of dangerous goods offered for transport, transported or imported may sometimes include shipping names not listed in Schedule 1 of the *Transportation of Dangerous Goods Regulations*.

The *Transportation of Dangerous Goods Regulations* are based on the United Nations *Recommendations on the Transport of Dangerous Goods* (UN Model Regulations). Schedule 1 of the *Transportation of Dangerous Goods Regulations* is based on the list of dangerous goods in Chapter 3.2 of these *Recommendations*. A revised edition of the UN Model Regulations is published every two years, and new shipping names are added to each new edition. The *ICAO Technical Instructions* and the *IMDG Code* are also revised every two years. While the *Transportation of Dangerous Goods Regulations* are periodically amended, the amendments do not come into force at defined intervals and do not all contain new shipping names. Therefore, the UN Model Regulations, the *ICAO Technical Instructions* and the *IMDG Code* contain a multitude of shipping names not yet found in the *Transportation of Dangerous Goods Regulations*, and these names will be included in Schedule 1 during future amendments.

However, it is possible to use these shipping names even if they are not yet included in Schedule 1 of the *Regulations*. Section 1.10 (*http://www.tc.gc.ca/eng/tdg/clear-part1-475.htm#sec110*) states that a person may use the appropriate classification set out in the *ICAO Technical Instructions*, the *IMDG Code* or the UN Model Regulations to transport dangerous goods by a road vehicle, a railway vehicle or a ship on a domestic voyage.

Please note that when a shipping name not appearing in Schedule 1 is chosen, the person offering for transport or importing must determine whether an Emergency Response Assistance Plan (ERAP) is required under Part 7 of the *Regulations*. A list of materials for which an ERAP index exists is available at the following Web page: *http://www.tc.gc.ca/eng/tdg/clear-newerapnumbers-87.htm*. These materials are listed in order of UN number.

For questions on the classification of dangerous goods, feel free to consult the advisory notice on the topic (*http://www.tc.gc.ca/fra/tmd/publications-avisle-advol7fnew-291.htm*) or to contact your regional Transport Dangerous Goods office:

Atlantic Region
1-866-814-1477
TDG-TMDAtlantic@tc.gc.ca

Quebec Region
(514) 283-5722
TMD-TDG.Quebec@tc.gc.ca

Ontario Region
(416) 973-1868
TDG-TMDOntario@tc.gc.ca

Prairie & Northern Region
1-888-463-0521 or (204) 983-3152
TDG-TMDPNR@tc.gc.ca

Pacific Region
(604) 666-2955
TDGpacific-TMDpacifique@tc.gc.ca

Canada

DOMINO DERAILMENTS DISRUPTED

BY BARBARA DI BACCO

The Transport Dangerous Goods Directorate is currently working with the National Research Council of Canada - Centre for Surface Transportation Technology (NRC - CSTT) on the Tank Car Domino Effect Project. This project will allow us to better understand tank car domino rollover derailments and to assess potential solutions that could reduce these types of derailments during dangerous goods unit tank train operations.

The objectives of the Tank Car Domino Effect project are:

- To gather relevant historical information regarding tank car domino derailments and involvement of shelf couplers;
- To understand the mechanisms involved in multiple tank car rollovers; and
- To propose and examine potential remedies to this problem, using full-scale physical testing and computer simulation models.

Multiple tank car unit trains loaded with gasoline or aviation fuel and equipped with double shelf E-type couplers have been the subject of some controversy in recent years due to several accidents resulting in domino-type derailments (for e.g., Figures 1 and 2) .

Figure 1: Multiple tank car rollover derailment, Lévis, Québec, July 2002

Figure 2: Multiple tank car rollover derailment, Clara City, Minnesota, October 2007

Double-shelf couplers are required under the *Transportation of Dangerous Goods Regulations* and have reduced incidents of tank car puncture during derailments. The top and bottom shelves prevent couplers from separating vertically during an accident, reducing the risk of a separated coupler hitting and puncturing nearby tank cars (see Figure 3).

However, the benefit provided by these couplers seems to come at the cost of increasing the number of cars involved in each derailment. A few derailing tank cars are able to cause subsequent tank cars to derail and roll over as well, leading to domino effect derailments. Empty tank cars or tank cars carrying residual amounts of dangerous goods are particularly susceptible to this type of occurrence; however a review of accident reports has shown that full cars can also be involved in domino-type derailments, albeit with fewer cars rolling over.

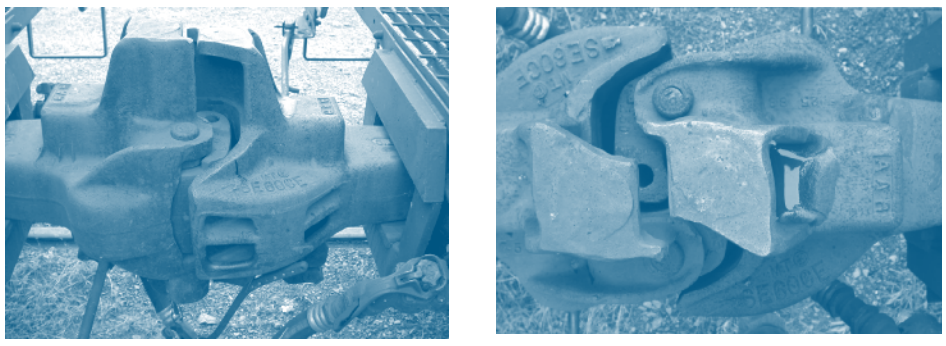


Figure 3: Standard double-shelf couplers in service.

This project will examine if and how these double shelf couplers contribute to domino effect derailments and will assess if a new coupler design built by NRC-CSST (a rotary double-shelf coupler) could reduce these types of derailments of dangerous goods unit tank trains. This new coupler design includes a rotary component that would likely eliminate the ability of a derailing car to transmit a torque to the adjacent car through the coupling.

NRC-CSST completed **Phase 1** of this project in March 2009. It included:

- Performing a literature review of accident reports to look at the involvement of both empty and full tank cars in this phenomenon;
- Performing a theoretical analysis of potential derailment mechanisms;
- Proposing and discussing potential solutions.

Phase 2 of this project is in-process and will be completed by March 2012. Phase 2 includes:

- Performing an energy analysis to determine the amount of energy required to roll a string of empty and full tank cars (completed in December 2010);
- Creating a computer model to simulate domino rollovers of both the empty and full tank car scenarios with standard double-shelf couplers and to simulate the performance of the proposed solution (rotary double-shelf coupler) in both scenarios (in-process);
- Conducting a dry-run full scale test using three tank cars equipped with standard double shelf e-type couplers (completed in August 2010) to determine how to best initiate a rollover;
- Conducting a full-scale fully-instrumented rollover test with four tank cars using currently mandated standard double shelf e-type couplers (completed in February 2011) to assess the baseline;
- Conducting a full-scale fully-instrumented rollover test with four tank cars using a rotary double-shelf coupler between cars 2 and 3 to assess the effectiveness of this proposed solution (completed in March 2011).

The full-scale tests showed that the standard double shelf coupler design can cause a domino effect by allowing torque to be transferred between tank trucks due to the contact of the coupler knuckle with the vertical walls of the double shelf. During the March 2011 test, the modified rotary double shelf coupler successfully stopped the domino effect (see Figure 4) by reducing the transmission of torque. However, the Transport Dangerous Goods Directorate felt that one more test was required to confirm the effectiveness of this new coupler design. Therefore, the National Research Council of Canada performed a final full-scale rollover test on July 26th, 2011 using a string of five tank cars. The cars were coupled with standard double shelf e-couplers, except the connection between the 3rd and 4th cars, which had a rotary double-shelf coupler. The aim of this final test was to subject the rotary double-shelf coupler connection to a more dynamic domino effect (i.e. putting this coupler further along in the domino chain) as a proof-of-concept. An article on the results of these tests and conclusions reached will follow in the next edition of the Transport Dangerous Goods Newsletter.

Figure 4: Result of test using modified rotary coupler – March 2011

The ultimate end goal for the Transport Dangerous Goods Directorate is a reduction in domino effect derailments of dangerous goods unit trains, thereby lowering the risk of potential for leakage, fire (if ignition source nearby) and environmental issues associated with product release.

Special thanks to GATX and Procor Ltd. for their donation of tank cars for full-scale testing.

EDITORIAL

It seems that warm seasons have already come to an end. Here at the Transport Dangerous Goods Directorate, the Spring, Summer and early Fall (so far, and most likely the rest), have been very busy months. Some really interesting research projects, involving our Research, Evaluation and Systems branch, have progressed and you can read an article about one of those projects on page 2. The expertise of our colleagues in the Regulatory Affairs branch has been much in demand, read to articles on pages 3 and 5 to find out about some of the new standards that have recently been published. As for events worth noting, the Kaboom live agent exercise was a great success and a vent and burn incident involving a highway cargo tank, where an ERAP was activated, have kept our specialists busy in the past months. Turn to the articles on pages 4 and 8 to find out more. This Fall edition also contains some articles on regulatory issues, ongoing collaboration with our regional offices and other information that you will surely find of interest.

We are continuing to make adjustments to improve the new format of the TDG Newsletter. Comments received for the first issue in newspaper format have been positive and your feedback is always welcome. And don't forget that we are always happy to receive suggestions of topics you would like to see addressed.

Happy reading and see you again in the Spring.

Véronique Tessier

CSA STANDARD B625-08 *PORTABLE TANKS FOR THE TRANSPORT OF DANGEROUS GOODS*

BY DANIEL SAVARD

Portable tanks have been part of the transport landscape for several years already. Some older portable tank specifications such as International Maritime Organization (IMO) type tanks under the *International Maritime Dangerous Goods Code* (IMDG Code) or International Maritime (IM) type tanks under *Title 49 of the U.S. Code of Federal Regulations* (49 CFR) are currently permitted for the transport of dangerous goods in Canada. Extensive revisions made to the 1999 edition of the United Nations *Recommendations on the Transport of Dangerous Goods* (UN Model Regulations) led to the creation of the UN portable tank specification and prompted the creation of a new standard in Canada, which was subsequently published in 2008 and is now known as Canadian Standards Association (CSA) standard B625-08. Harmonized with the 14th edition of the UN Model Regulations, the CSA standard prescribes design, manufacture and periodic test and inspection requirements for UN portable tanks in Canada. The CSA standard also prescribes selection and use requirements for UN portable tanks in Canada regardless of where the UN portable tank was manufactured. Future editions of the standard can be expected for continued harmonization with the UN Model Regulations and to address future regulatory changes.

The CSA B625-08 standard defines a UN portable tank as a container with a capacity of over 450 litres that is intended for the transport of dangerous goods by different modes of transport. It consists of a shell fitted with service equipment and structural equipment necessary for the handling or transport of those dangerous goods. Unlike highway tanks and rail tank car tanks which are designed to be permanently mounted to a transport vehicle, the UN portable tank is designed to be temporarily attached to a transport vehicle or ship. The CSA B625-08 standard also makes a distinction between a UN portable tank that is and is not a tank container. A tank container being a UN portable tank that is fitted within an "ISO" type frame and therefore must be in accordance with additional requirements set in the CSA B625-08 standard.

A UN portable tank can be used for dangerous goods of class 1, 2, 3, 4, 5, 6.1, 8, and 9. CSA standard B625-08 provides the requirements for selection and use for those dangerous goods with the exception of Class 1 dangerous goods, Explosives. The selection and use requirements for explosives will be addressed in an upcoming revision of the CGSB 43.151 standard.

The CSA B625-08 standard prescribes the registration requirements for designing, manufacturing, testing, inspecting and repairing of UN portable tanks in Canada. The standard also addresses the design approval process for new designs that receive approval in Canada. UN portable tanks approved by a country other than Canada will be accepted in Canada provided they meet the requirements of the UN Model Regulations, the requirements of the country of approval and additional requirements found in the CSA standard.

For additional information regarding UN portable tanks and the CSA B625-08 standard requirements, you may contact Daniel Savard by phone at (613) 990-1137 or by email at **Daniel.Savard@tc.gc.ca**.

NEW EDITION OF STANDARD FOR AEROSOL CONTAINERS AND GAS CARTRIDGES

BY PASCAL VERVILLE

The second edition of CGSB-43.123, *Aerosol Containers and Gas Cartridges for Transport of Dangerous Goods* was published by the Canadian General Standards Board (CGSB) in June 2010. It supersedes the previous edition published in 1986, *Containers, Metal, Aerosol (TC-2P, TC-2Q)* and has been significantly revised to provide for the maximum degree of harmonization with the United Nations *Recommendations on the Transport of Dangerous Goods* (UN Model Regulations) while taking into account proven North American experience and practice, as well as recent technical advances made in this realm.

In developing this revised standard, the CGSB technical committee considered several publications such as the Canadian *Transportation of Dangerous Goods Regulations, Title 49 of the U.S. Code of Federal Regulations* (49 CFR), *The Technical Instructions for the Safe Transport of Dangerous Goods by Air,* published by the International Civil Aviation Organization, and the British Standard BS 5597:1991 – *Specification for non-refillable plastics aerosol dispensers up to 1000 mL capacity.* The CGSB technical committee was comprised of members having expertise in the design, manufacturing, testing, use, filling, and regulation of aerosol containers and gas cartridges.

The most significant changes in the second edition include the following:

- The addition of definitions for terms such as "durable marking", "lot", and "gas cartridge";
- The addition of a new specification for metal aerosol containers (TC-2R). TC-2R specification aerosol containers are equipped with a pressure-relief device(s) and are designed to allow for a higher filling pressure compared to TC-2Q containers. The TC-2R aerosol container requirements were based on the provisions specified in several Permits for Equivalent Level of Safety (now Equivalency Certificates);
- The addition of a new specification for plastic aerosol containers (TC-2S). Similar requirements have recently been incorporated into 49 CFR of the United States by virtue of final rule HM-215J published on January 14th, 2009;
- The addition of requirements for gas cartridges (TC-2P and TC-2R);
- Revised marking requirements;
- The addition of quality management system requirements for manufacturing facilities and facilities responsible for filling aerosol containers and gas cartridges;
- Revised Transport Canada registration requirements for manufacturers of aerosol containers and gas cartridges. Under the new standard, manufacturers will be required to obtain a Certificate of Registration from the Director, Regulatory Affairs Branch, Transport Dangerous Goods Directorate, Transport Canada, prior to the application of the prescribed specification marks. The applicant is required to submit a description of the manufacturing processes, and the applicable quality control, testing, and inspection procedures, as well as a description of their quality management system. This is a similar requirement to that currently applied to other dangerous goods transport containers in Canada;
- The addition of selection and use requirements that were based on the provisions currently specified in section 5.11 of the *Transportation of Dangerous Goods Regulations;*
- The addition of provisions for the transport of aerosol containers and gas cartridges intended for disposal from a collection facility. Such provisions are currently specified in conditions of Permits for Equivalent Level of Safety, now known as Equivalency Certificates, issued by Transport Canada; and
- The addition of a new requirement in relation to dangerous goods classified as UN1950, AEROSOLS, or UN2037, GAS CARTRIDGES, making compliance of the containers to the new standard mandatory in those cases. For other gases, the use of an aerosol container or gas cartridge under the standard will continue to be an option.

This revised standard will be proposed for adoption in a forthcoming amendment to the *Transportation of Dangerous Goods Regulations*. Until the Regulations are amended, the 1986 edition of the standard remains the one legally in force.

Copies of the revised standard in both official languages can be purchased on the Canadian General Standards Board's web site at: ***http://www.techstreet.com/info/cgsb.html*** or through:

Canadian General Standards Board
Sales Centre
Gatineau, Quebec
K1A 1G6
Tel: 1-800-665-2472, or (819) 956-0425
Fax: (819) 956-5740

KABOOM
A RADIOLOGICAL EXERCISE

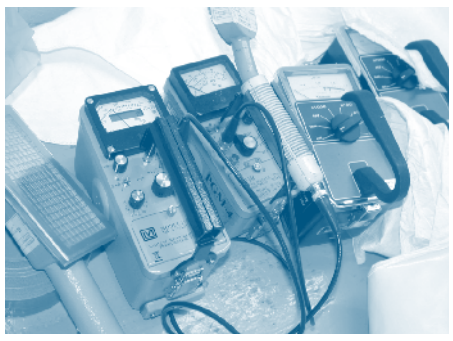
BY KATHLEEN CORRIVEAU AND FRED SCAFFIDI

The Transport Dangerous Goods Directorate of Transport Canada is pleased to report its successful partnership with Defense Research and Development Canada – Center for Security Science (DRDC-CSS) in developing and conducting a hands-on live agent exercise in Windsor, Ontario, in February 2011. The exercise involved response to a radiological dispersal device and provided an opportunity for our industry response teams with capability to respond to radiological materials to work with authorities on-site and integrate into incident command during a suspected terrorist event. The exercise was very well received and demonstrated the utility of industry to the first response community (primarily police and fire), not only during recovery phases but also during initial phases of incident response.

This exercise provided a unique opportunity for industry and government authorities to work together during a CBRNE event.

Transport Canada is an important contributor to the *Chemical, Biological, Radiological, Nuclear and Explosives (CBRNE) Resilience Strategy for Canada* (January 2011) and the CBRNE Resilience Action Plan pursuant (see *http://www.publicsafety.gc.ca* for more information). The Strategy and Action Plan are the result of a collaborative effort involving all levels of government within Canada to provide for capabilities and standards in dealing with CBRNE threats. These documents provide a policy framework that ensures that the four components of emergency management, namely prevention/mitigation, preparedness, response and recovery are addressed in the most effective manner possible as they relate to CBRNE. Transport Canada, through its CBRNE Response Program (based on the current Emergency Response Assistance Plan Program, or ERAP), has been actively engaging the industry emergency response community by providing training and opportunities to participate in hands-on exercises such as the one presented here. Our goal is to enhance existing CBRNE capabilities in Canada through the use of ERAP industry resources which we believe are a significant asset to authorities.

The scenario for the exercise involved the explosion of a cube van carrying unknown radiological materials in a high consequence area in regards to population and economic impact. Many government agencies were involved in this exercise, however the on-scene command was the Ontario Provincial Police. This exercise was part of a much larger group of exercises called Central Gateway which were occurring at the same time.



Some of the objectives for our exercise included:

- Understanding the capabilities of the industry/contractor community and how these can be used to assist the various agencies at the scene.
- Evaluating how the industry would integrate with the first responders.
- Testing the authorization/activation mechanism of a CBRNE ERAP.

Industry participants worked in the following areas:

Verification
- Confirming the type of material/source involved.
- Quantifying the contaminated area and the hazards to the population.
- Supplying subject matter experts and having a representative in the incident command centre.

Monitoring
- Providing detection equipment and expert advice on monitoring large areas to the incident command.
- Providing information on interpreting readings from instruments, what radiation exposure levels could be expected and how long these levels could be tolerated by the responders on scene.

Response
- Providing logistical support in the early phases – containers for highly radioactive sources, recommendations on handling of contaminated persons and others.
- Implementing a plan to coordinate the clean-up activities.

Recovery
- Industry had the biggest role, with oversight from Ontario Provincial Police and Canadian Nuclear Safety Commission (CNSC).
- Developing a recovery plan to coordinate resources/equipment/logistics/expertise which was submitted to CNSC for approval.
- Discussing and suggesting solutions to the follwing questions: What will be done with the product and waste generated from such an operation? Who will take the contaminated vehicle? How clean does the site need to be before being declared safe?

This exercise provided a unique opportunity for industry and government authorities to work together during a CBRNE event. It became clear in the early stages that the additional expertise and equipment from industry could be (and were) useful to the first responders. It also demonstrated the value of Transport Canada's CBRNE Response program and just how significant the changes to the *Transportation of Dangerous Goods Act* allowing for authorization of an ERAP, compensation and liability protection truly are.

We would like to thank our industry partners for participating in this event, namely, Atomic Energy of Canada Limited, Monserco (an Energy Solutions Company), Stuart Hunt and Associates, Hydro-Québec, Ontario Power Generation and AREVA Canada. Having witnessed first-hand the expertise and dedication of industry, on behalf of all Canadians, we say "well done and thank you".

We would like to thank the DRDC – CSS for accepting us as partners for this exercise and working Transport Canada objectives into the overall objectives for the exercise. The same is no less true of the Ontario Provincial Police who gave us the chance to demonstrate the value of industry. We must also recognize the hard work of International Safety Research, the contracted exercise planning organization that had to work on a very tight timeline to make the exercise happen.

We would also like to acknowledge the Canadian Nuclear Safety Commission for facilitating the exercise.

Please contact Fred Scaffidi (**Fred.Scaffidi@tc.gc.ca**) or Kathleen Corriveau (**Kathleen.Corriveau@tc.gc.ca**) for further information about the exercise and about our future plans in this area.

EMAIL STATS

BY DANNY BECHAMP

During the 2010-2011 fiscal year (April 1, 2010 to March 31, 2011), the Inspector Education and Public Awareness division of the Transport Dangerous Goods Directorate received approximately 900 emails from the general public, including industry and householders, all of whom sought some guidance on the *Transportation of Dangerous Goods Act*. Approximately 350 emails were answered by this division, while the other 550 were answered by; one of five Transport Dangerous Goods Regional offices, a means of containment specialist (engineering group), or other staff within the Transport Dangerous Goods Directorate. Typically, the answer is provided within 24 hours of receipt although some questions require more research. At other times, a representative of the Directorate will contact the person to obtain more information prior to responding.

Most of the questions are related to the *Transportation of Dangerous Goods* Regulations. Based on the frequency of certain questions, we update our list of frequently asked questions (FAQs), found on our website, to better serve the public.

To find out more about the *Transportation of Dangerous Goods Regulations*, please contact your regional Transport Dangerous Goods office or contact us at TDGTraining-FormationTMD@tc.gc.ca

Atlantic Region	1-866-814-1477	TDG-TMDAtlantic@tc.gc.ca
Quebec Region	(514) 283-5722	TMD-TDG.Quebec@tc.gc.ca
Ontario Region	(416) 973-1868	TDG-TMDOntario@tc.gc.ca
Prairie & Northern Region	1-888-463-0521 or (204) 983-3152	TDG-TMDPNR@tc.gc.ca
Pacific Region	(604) 666-2955	TDG-TMDPacific@tc.gc.ca

NEW STANDARDS ON UN CYLINDERS, TUBES, AND MULTIPLE-ELEMENT GAS CONTAINERS FOR USE IN CANADA

BY PASCAL VERVILLE

The following two new standards have been published by the Canadian Standards Association (CSA):

CSA Standard B341-09, *UN pressure receptacles and multiple-element gas containers for the transport of dangerous goods*; and

CSA Standard B342-09, *Selection and use of UN pressure receptacles and multiple-element gas containers for the transport of dangerous goods, Class 2*.

These new standards establish domestic requirements for Canada in relation to UN cylinders, tubes, and multiple-element gas containers (MEGCs) for transport of dangerous goods included in Class 2, Gases.

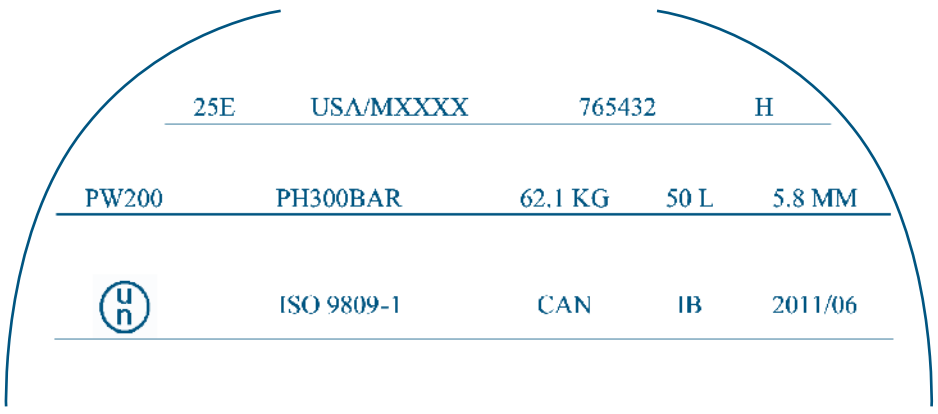
Both these standards, which reflect use and safety experience, and advances in technology and industrial practices, are closely harmonized with the United Nations *Recommendations on the Transport of Dangerous Goods* (UN Model Regulations). Gas cylinders and tubes are referred collectively as "pressure receptacles" by the UN. A MEGC is an assembly of UN pressure receptacles (elements) interconnected by a manifold and assembled within a framework and includes the service and structural equipment necessary for the transport of gases. Such assemblies are the high-pressure equivalents of tank containers, referred to as portable tanks by the UN, and are suitable for carrying gases in all modes. The requirements for UN pressure receptacles are based on standards published by the International Organization for Standardization (ISO). The relevant International Standards are produced by ISO technical committee ISO/TC58, *Gas Cylinders*, and its three subcommittees – SC2, *Cylinder fittings*, SC3, *Cylinder Design* and SC4, *Operational requirements for gas cylinders*. Transport Canada has and continues to participate in the development of the relevant ISO standards as a committee member representing the Standards Council of Canada, the ISO member body for Canada.

The CSA B341 standard prescribes the requirements for the manufacture of UN pressure receptacles and MEGCs under the authority of the "competent authority" of Canada (Transport Canada). CSA B341 also prescribes the requirements that must be met for periodic inspection and testing (requalification) of UN pressure receptacles and MEGCs. The intervals for the periodic inspection and testing are specified in CSA B342.

The CSA B341 standard requires that any UN pressure receptacle or MEGC manufacturer wishing to manufacture pressure receptacles or MEGCs under that standard must obtain approval for their pressure receptacle or MEGC designs and their quality system from Transport Canada. CSA B341 details the information that must be submitted by the manufacturer, which will then be verified for compliance with the standard by departmental staff as a condition for approval (called "registration" by the standard). A UN pressure receptacle or MEGC manufacturer would be authorized to display the "CAN" "country of approval" certification safety mark, the UN packaging symbol, and the other prescribed certification markings under CSA B341, only on pressure receptacles and MEGCs covered by a certificate of registration issued by Transport Canada under CSA B341. These requirements would apply regardless of where a UN pressure receptacle or MEGC manufacturer is located, whether in Canada or abroad.

The CSA B342 standard prescribes the selection requirements for UN pressure receptacles in relation to the gas to be contained, and prescribes other limits and requirements on the use of UN pressure receptacles and MEGCs in Canada. The CSA B342 standard also prescribes the requirements for the design and testing of gas cylinder valves, valve protection, and pressure-relief devices. The use requirements and limits on UN pressure receptacles differ considerably in their detail from the requirements currently applicable to currently existing domestic cylinders and tubes in Canada. Therefore UN pressure receptacles will be required to be used for Class 2 dangerous goods in Canada in accordance with CSA B342, whereas the use of current ("TC") cylinders and tubes will still be governed under CSA B340.

What are some differences between UN pressure receptacles and "TC" cylinders? The markings, the filling limits, and the requalification intervals are among the notable differences. The following is an example of markings applied to a UN cylinder:



The top row contains *manufacturing marks* such as the cylinder thread type, the country of manufacture, and the serial number assigned by the manufacturer. The middle row contains *operational marks* such as the test pressure, the tare or empty weight, and the minimum guaranteed wall thickness. The bottom row contains *certification marks* such as the UN packaging symbol, the ISO standard used for the design, manufacturing, and testing, and the country of approval. Please consult CSA B341 for more details on the marking requirements.

The filling requirements of UN pressure receptacles, as set out in CSA B342, are based on those prescribed in Packing Instruction P200 of the UN Model Regulations and represent significant advances in harmonizing filling ratios for gases in cylinders.

For most UN pressure receptacles, the requalification period is 10 years. For UN composite cylinders and other UN pressure receptacles used for toxic gases, the requalification period is 5 years.

The accomplishment of new technical requirements for pressure receptacles through the UN Model Regulations is a significant and welcome achievement. Nonetheless, although the provisions in relation to pressure receptacles in the UN Model Regulations now enjoy international support for their technical adequacy, the operation of those provisions in terms of national implementation and mutual recognition of approvals between international competent authorities remains an issue. Although most other UN container types are accepted for use in most countries on the strength of the approval issued by the country of manufacture, this is not generally the case for UN pressure receptacles any more than it has been the case of pressure receptacles approved under national standards.

Between Canada and the United States the issue of mutual recognition of regulatory approvals for UN pressure receptacles has been addressed. Clause 5.1.3 of CSA B342 recognizes for use in Canada UN pressure receptacles bearing the country of approval mark "USA" applied in accordance with *Title 49 of the U.S. Code of Federal Regulations* (49 CFR), in like manner to pressure receptacles approved under CSA B341 with the "CAN" country of approval mark. In paragraph 171.12(a)(4) of 49 CFR, as amended by the recent HM-215F rulemaking, UN cylinders with the "CAN" country of approval mark are recognized for use in the United States equally to UN cylinders with the "USA" country of approval mark. Users of UN "CAN" or UN "USA" cylinders will therefore benefit from reciprocal recognition of regulatory approvals not currently afforded to the cylinder under existing regulations.

The CSA B341 and CSA B342 standards will be proposed for adoption in a forthcoming amendment to the *Transportation of Dangerous Goods Regulations*. It must be emphasized that these new standards were not prepared with the intention of removing existing requirements for "TC" cylinders; rather, they were developed to incorporate the ISO standards as referenced in the UN Model Regulations as an optional means of compliance and hence to provide for a broader selection of containers for transport of gases. The provisions for UN pressure receptacles and MEGCs and the existing provisions of section 5.10 of the *Transportation of Dangerous Goods Regulations* addressing the "TC" cylinders, tubes and other containers under CSA B340 will be proposed to coexist in parallel. Therefore cylinder manufacturers wishing to continue the manufacture of existing cylinder types and users wishing to continue their current practices would not be affected by the introduction of these new container types. By increasing the variety of containers available to Canadian shippers of gases, we expect there to be opportunities for increased efficiency and reduced costs to industry along with a more effective promotion of public safety.

If one wishes to manufacture UN pressure receptacles or MEGCs under Canadian approval or wishes to use UN pressure receptacles or MEGCs for transport of dangerous goods in Canada prior to the adoption in regulation of the new standards, one will need to apply for and receive an Equivalency Certificate under Part 14 of the *Transportation of Dangerous Goods Regulations*. To date, several such certificates have been issued by Transport Canada.

Copies of the new standards are available in both official languages and can be obtained by contacting the Canadian Standards Association (CSA) at 1-800-463-6727 or by visiting their website at *http://www.csa.ca*.

WORKING TOGETHER

BY MARC GRIGNON

Harmonization has been the focus of the Transport Dangerous Goods Directorate for some time. In recent years, problems arising from having to deal with a variety of regulations were highlighted by representatives of provinces and territories.

The National Compliance Working Group was created to address these issues as well as to provide a forum for the provinces and territories to exchange information and seek clarification from the federal government on compliance and enforcement matters related to the transportation of dangerous goods. The first meeting was held in Ottawa on October 27, 2008.

Federal transportation of dangerous goods inspectors enforce the *Transportation of Dangerous Goods Act, 1992* and its *Regulations* throughout Canada for all four modes of transport (surface, air, rail and marine). The provinces and territories have also enacted legislation with respect to the handling, offering for transport and transporting of dangerous goods. As agreed in the memoranda of agreement, provinces and territories are responsible for on-road enforcement. Alberta is the exception as, by the terms of their agreement, they provide both on road and facility enforcement.

Through a team approach, while still respecting the spirit of organizational accountability, the National Compliance Working Group establishes a uniform and collaborative approach to monitoring compliance and enforcement actions.

The objectives of the National Compliance Working Group are to:

- Provide a forum for the provinces and territories to exchange information and seek clarification with the federal government on compliance and enforcement matters;
- Seek consensual agreement regarding the implementation and monitoring of compliance matters;
- Identify and discuss issues and needs pertaining to compliance and enforcement matters;
- Share best practices;
- Promote public safety in the transportation of dangerous goods within Canada;
- Identify threats to public safety;
- Enforce the *Transportation of Dangerous Goods Regulations* in a uniform and collaborative manner; and
- Provide recommendations to the Federal/Provincial-Territorial Transportation of Dangerous Goods Task Force.

The working group is chaired by the Director, Compliance and Response of the Transport Dangerous Goods Directorate and includes representatives from each province and territory, representatives from all five Transport Dangerous Goods Directorate regional offices as well as representatives from the Directorate headquarters. The group meets every Spring and Fall.

This collaborative initiative has been a success for the past four years and will surely pave the way for further integrated approaches to monitor compliance and enforce transport dangerous goods legislative and regulatory requirements.

EDUCATION AND AWARENESS IN THE PRAIRIE AND NORTHERN REGION

BY DEBBIE MAYERS

In an effort to reach out to those regulated by transportation of dangerous goods inspectors, the Prairie and Northern region has attended a number of trade shows to educate and promote awareness about the Transportation of Dangerous Goods program.

An inspector attending a Transport Dangerous Goods Directorate booth at a trade show can certainly speak with far more people involved in the industry over a day or two, than they could if they were out inspecting sites. Conducting inspections is an important aspect of an inspector's duties to ensure compliance with the *Transportation of Dangerous Goods Act, 1992* and its *Regulations*, however, educating others and providing awareness material in a relaxed trade show environment strengthens working relationships. These, in turn, can prove valuable when an inspector is seeking compliance, and attendees in a casual atmosphere are more likely to stop by the booth to learn more about transportation of dangerous goods regulatory requirements.

Below is a list of conferences and trade shows that Prairie and Northern region transportation of dangerous goods inspectors have attended as exhibitors, as well as an indication of who the main participants were:

- **Manitoba Emergency Services Conference**
  - September 2011, Brandon, Manitoba.
  - Attendees included fire fighters and other emergency services personnel who may be the first to arrive at the scene of a transportation incident involving dangerous goods. They may refer to the Emergency Response Guidebook (ERG) developed in part by Transport Canada, to aid them in quickly identifying the specific or generic hazards of the material(s) involved in the incident, and assist them is protecting themselves and the general public during the initial response phase of the incident.

- **Canadian Association of Agri-Retailers (CAAR)**
  - April 2011, Edmonton, Alberta.
  - An annual event attended by dealers and suppliers within the agricultural sector.

- **Saskatchewan Association of Fire Chiefs**
  - April 2011, Weyburn, Saskatchewan.
  - Attendees included fire fighters and other emergency services personnel who may be the first to arrive at the scene of a transportation incident involving dangerous goods. They may refer to the Emergency Response Guidebook (ERG) developed in part by Transport Canada, to aid them in quickly identifying the specific or generic hazards of the material(s) involved in the incident, and assist them is protecting themselves and the general public during the initial response phase of the incident.

- **Southern Alberta Fire Department Conference**
  - October 2010, Lethbridge, Alberta.
  - Attendees included fire fighters and other emergency services personnel who may be the first to arrive at the scene of a transportation incident involving dangerous goods. They may refer to the Emergency Response Guidebook (ERG) developed in part by Transport Canada, to aid them in quickly identifying the specific or generic hazards of the material(s) involved in the incident, and assist them is protecting themselves and the general public during the initial response phase of the incident.

- **Saskatchewan Association of Rural Municipalities**
  - March 2010, Regina, Saskatchewan
  - This show normally draws around 2,000 people with the majority being reeves, councilors and rural municipal administrators. Many rural municipalities are involved with dangerous goods in their public works departments.

Each one of these conferences/trade shows welcomed the attendance of a transport dangerous goods inspector at their event as our attendance provided knowledge about the Transportation of Dangerous Goods program to their attendees.

Future plans include the continued presence of inspectors from the Prairie and Northern Region and providing education and awareness about the program at conferences and trade shows. It is important to continue to strengthen working relationships with our stakeholders so that the ultimate goal of compliance with the *Transportation of Dangerous Goods Act, 1992* and its *Regulations* is achieved.

EMERGENCY RESPONSE ASSISTANCE PLANS – A CRITICAL PROGRAM FOR FIRST RESPONDERS

BY RÉJEAN SIMARD

As you approach the accident scene with flashing lights and sirens, you spot the site of a train derailment. The skull and cross-bones on the diamond shaped placards and the steady stream of product flowing from a two inch gash in the tank give you some indication of the task at hand. You gather all the information you can from a distance, including the UN number, and you consult the Emergency Response Guidebook (ERG). You take the necessary precautions to protect the public by shutting down the highway along the tracks and evacuating the homes that fall within the isolation distance recommended by the ERG. You contact CANUTEC and the advisor warns you that the product is highly toxic and corrosive to skin and most metals. As the Fire Chief and incident commander, what resources do you have available to deal with this incident?

The setting could be near any rail line or highway in any Canadian province or territory. It could involve any of hundreds of products in commercial trade on any given day. It could also involve any one of the many neighbourhoods serviced by volunteer fire departments, most of which have never had to respond to a "Hazmat" call.

Many high risk dangerous goods in transport require specialized response equipment and knowledge of the dangerous goods (also known as Hazmat), means of containment and handling procedures and specialized response procedures in order to respond to an incident effectively and safely. For this reason, the *Transportation of Dangerous Goods Regulations* require that the company who offered for transport or who imported the high risk dangerous goods must provide assistance to first responders when requested to do so. This assistance is outlined in an Emergency Response Assistance Plan (ERAP) which has been previously filed with Transport Canada. The first responders can request assistance by using the ERAP activation phone number found on the shipping document. The ERAP information on a shipping document would be presented as follows:

A reference number preceded or followed by either ERAP, ERP or PIU followed by the activation phone number (for example: ERP2-9999: (613) 123-4567).

If you are unable to obtain a copy of the shipping document, because, for example, the cab of the truck is inaccessible, CANUTEC or a dangerous goods inspector from Transport Canada may be able to assist in identifying and contacting the ERAP holder. CANUTEC also maintains a database of contacts for government, industry and in particular for transportation of dangerous goods inspectors. You can contact CANUTEC at 613-996-6666 or by dialling *666 on a cellular phone.

The ERAP requirement can be traced back to the 1979 Mississauga derailment where approximately 200 000 people were evacuated following the breach of a chlorine tank car and several liquefied petroleum gas tank car explosions. Although industry responded on a voluntary basis to this accident, questions were raised during a subsequent inquiry about the effectiveness of the industry response and the fact that industry was not legally obligated to respond. It was recognized that industry's role was critical to the response and should be made mandatory. The ERAP requirement was introduced into the *Transportation of Dangerous Goods Regulations* in 1985 and has proven its value many times over the years. There are currently 928 ERAPs approved by Transport Canada.

There were 55 ERAP activations in Canada in 2010 dealing with such high risk dangerous goods as propane, sulphur dioxide, chlorine and anhydrous ammonia and all activations were successful in providing an effective response. The activations costs for an ERAP are usually borne by the person who offered the dangerous goods for transport and filed the ERAP with Transport Canada. In addition, our *Transportation of Dangerous Goods Act, 1992* has the feature that the ERAP holder is not personally liable either civilly or criminally in respect of any act or omission done in good faith and without negligence if the ERAP holder notifies CANUTEC that he is responding to an actual or anticipated release using his approved ERAP that applies to the release or anticipated release and acts in accordance to the ERAP (section 20(a) of the Act).

What is generally found in an Emergency Response Assistance Plan? The ERAP deals with preparedness and response. It should include a list of specialized equipment required for response, a list of trained responders, contact phone numbers for rental equipment, air charters, subcontractors, etc., and response procedures for critical tasks, including product transfer, neutralization, depressurization, grounding and bonding, etc. The plan should also include requirements for equipment maintenance, training and exercises. Transportation of dangerous goods remedial measures specialists are tasked with reviewing ERAP applications, suggesting changes and making recommendations regarding approval.

An approved ERAP is a valuable resource indeed to the first response community. Please keep it in mind when dealing with an accident involving dangerous goods. For more information, please contact Réjean Simard, Chief, Response Operations, by phone at 613-991-9396 or by email at **Rejean.Simard@tc.gc.ca**.

WORKING WITH THE PROVINCES IN ATLANTIC CANADA

BY MARCEL PELLETIER

For a number of years, the Atlantic regional office of the Transport Dangerous Goods Directorate has worked very closely with provincial regulators in New Brunswick, Nova Scotia, Newfoundland and Labrador and Prince Edward Island to enforce the *Transportation of Dangerous Goods Regulations*. Memoranda of Agreement have been put in place between Transport Canada and the provincial governments to allow provincial commercial vehicle enforcement officers to enforce the *Transportation of Dangerous Goods Regulations* with respect to the surface mode of transportation in each province of the Atlantic Region.

We are pleased to have provincial inspectors assist in the delivery of the Transportation of Dangerous Goods program, as we believe this has been a tremendous help in ensuring public safety as it pertains to dangerous goods shipments in the Atlantic provinces.

Throughout the year, federal and provincial representatives in the Atlantic Region attend meetings of the Eastern Compliance Group to discuss the Transportation of Dangerous Goods program. These meetings focus on regulations, standards, data and strategies. Joint federal-provincial inspections are also discussed and planned to address certain issues where it is deemed beneficial. Information gathered when performing these joint inspections also assists in the development of the Transport Canada's regional work plan and promotes the efficient use of resources to aid in protecting the environment and ensuring public safety.

In addition, to promote a uniform approach nationally, members of this same group also attend joint meetings held in Ottawa called Federal/Provincial-Territorial Transportation of Dangerous Goods Task Force. These meetings include representatives of the federal government as well as the provinces and territories. The results of these multi-jurisdictional fora assist in the development and delivery of the Transportation of Dangerous Goods program not only in the Atlantic Region but also nationally.

To find out more about what regional offices can do for you and your business, please contact your regional Transport Dangerous Goods office or visit the Transportation of Dangerous Goods website at: *http://www.tc.gc.ca/eng/tdg/safety-menu.htm*.

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HIGHWAY CARGO TANK VENT AND BURN
MCBRIDE (DOME CREEK) INCIDENT 2011

BY JOSÉE BOUDREAU AND DEAN MCCANN

The following article details a dangerous goods incident and the first use of the vent and burn response technique in Canada as a remedial response measure involving a highway cargo tank. The article also contains details on the Emergency Response Assistance Program in Canada as applicable to incidents involving high risk dangerous goods.

THE INCIDENT

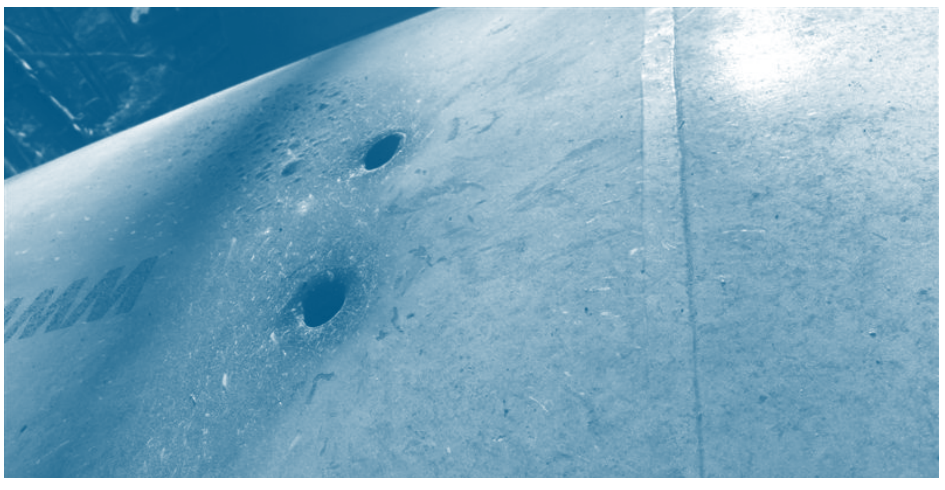
Between 11:00 p.m. and 12:00 p.m. on March 29, 2011 an eastbound B-train highway cargo tank combination (two trailers and a truck tractor) carrying liquefied petroleum gas went off the side of Highway 16 approximately 88 kilometers west of McBride, in British Columbia. The tractor became separated from the two trailers, which slide down the side of the highway embankment. The driver was able to exit the tractor unit and was picked up by a motorist prior to the lead cargo tank suffering a catastrophic failure. The failure resulted in the release and burn of the entire content of the lead tank, which was reported as visible from many miles away. Highway 16 was closed in both westbound and eastbound direction and an isolation perimeter of 1.6 kilometers was established by the Royal Canadian Mounted Police. It was identified that there were no residences within 5 kilometers of the incident site. The consignor's Emergency Response Assistance Plan (ERAP) was activated and response measures were initiated. An assessment of the scene was later conducted by response personnel and it was determined that the rear cargo tank was leaking, with a lazy flame emanating from the liquid spray fill piping that extended from the vessel. A response team subsequently attended the scene and various remedial measures were examined, including initiating a liquid flare to evacuate the product from the vessel. The vessel pressure, temperature and condition were monitored.

Following a determination that the piping was not viable to evacuate the product and a change in the nature of the fire, all other possible response measures were examined including the controlled vent and burn technique. An explosives expert with prior experience in vent and burn response measures and the emergency offloading of liquefied petroleum gas containers was dispatched by the ERAP holder.

On April 2, 2011 an extensive examination of the vent and burn proposal was conducted, including comprehensive consultation with various federal and provincial government agencies, response specialists and cargo tank specialists. Following this process, a decision was made to conduct the vent and burn operation on the rear cargo tank.

THE VENT AND BURN TECHNIQUE

The vent and burn response measure is a technique for conducting a controlled release and burn of the contents of a liquefied petroleum gas container. It involves the placement of explosive charges at the top of the tank in the vapour space and at the bottom of the tank in the liquid phase.



In this case, a total of five shaped conical charges containing 32 grams of explosives each were placed on the highway cargo tank and connected using detonator cord. Igniter units were also placed to ensure that the product released from the tank would burn. At approximately 2:15 pm, the procedure was employed with the initiation of the two charges located in the vapour space of the cargo tank. This allowed the vapour to be vented to reduce the tank pressure and flare off the liquefied petroleum gas. After the pressure was reduced in the tank, the bottom charges were detonated, releasing liquid propane from the bottom of the tank. The liquid contents released were ignited and burned in a containment area. Following the evacuation of the vessel, the incident was concluded and the highway was reopened.

LIQUEFIED PETROLEUM GAS

Liquefied petroleum gases are largely composed of propane and butane, with propylene, butylenes, ethane and other gases found in small amounts. The ratio of propane and butane found in liquefied petroleum gases depends mainly upon where it was produced. In North America, liquefied petroleum gases largely contain propane while in some European locations butane is the main constituent.

If a mixture of gas is involved, the law of partial pressures should be taken into consideration when assessing the pressure inside the means of containment. Dalton's Law of Partial Pressures states that the partial pressure of an ideal gas in a mixture is equal to the pressure it would exert if it occupied the same volume alone at the same temperature. The total pressure of a gas mixture is the sum of the partial pressures of each individual gas in the mixture. This would mean that most liquefied petroleum gas mixtures will have high vapour pressures. During a release, the most volatile gas will tend to escape initially followed by the less volatile gas.

For this particular incident, the liquefied petroleum gases contained a higher concentration of butane. Butane has a boiling point of -0.5ºC compared to -42ºC for propane. Since it has a boiling point near 0ºC, butane has a fairly low vapour pressure especially in a cold environment. As such, it is often very difficult to either offload or flare butane from a tank truck. In addition, the expansion ratio of liquid butane to gas is 1:240 which is lower than the expansion ratio of liquid propane to gas of 1:270. Releasing one volume of liquid butane would produce 240 volumes of gas.

The first responders may not know exactly what gas or gas mixture they will be dealing with at an accident site involving liquefied petroleum gases. Further inquiries with the ERAP holder and/or consignor might be required by the first responders to obtain additional information on the composition of the liquefied petroleum gases.

EMERGENCY RESPONSE ASSISTANCE PLAN (ERAP)

The Emergency Response Assistance Plans (ERAP) program may be traced to the recommendations made by Justice Grange following the enquiry into the Mississauga train derailment of November 1979.

ERAPs are required by the *Transportation of Dangerous Goods Regulations* for certain very harmful dangerous goods that necessitate special expertise and response equipment. The ERAP is intended to assist local emergency responders. The plan will explain how specialists and other personnel with knowledge, equipment and skills will be available at accident sites.

When dangerous goods require an ERAP, it is the responsibility of the person who offers for transport or imports these dangerous goods to apply for an ERAP. The reference number will be issued in writing by Transport Canada upon the approval of the ERAP. The reference number and activation telephone number must be displayed on the shipping document accompanying the consignment for which the plan is applicable. In certain instances, a person may use someone else's ERAP.

For this particular incident, members from the Liquefied Petroleum Gas Response Corporation were mobilized and responded to the incident as part of the ERAP activation.

Additional information regarding the ERAP program can be found at the following website: *http://www.tc.gc.ca/eng/tdg/erap-menu-72.htm.*

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DID YOU KNOW?

There are nearly 500 companies in North America registered with Transport Canada to manufacture, repair, inspect or test highway and large portable tanks used for the transport of dangerous goods in Canada. These companies are required by law to ensure that all tanks meet the prescribed safety requirements identified in the *Transportation of Dangerous Goods Regulations*. This ensures that dangerous goods are safely transported throughout Canada while minimizing the regulatory burden to the transportation industries involved.

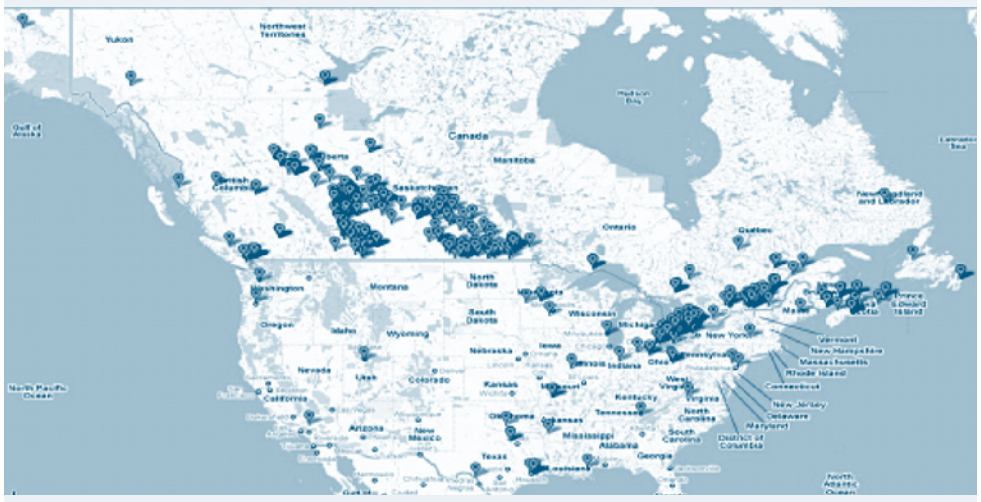

Figure 1: All active B620 facilities in North America – 479 overall. 37 Active facilities in the United States.

Transport Canada works with government of the Unites States agencies to harmonize our Regulations and allow for unrestricted transport of dangerous goods across our border. This provides the industry with a stable framework under which they may operate while maintaining safe transport of dangerous goods.

Transport Canada is leading the charge to improve the safe transport of dangerous goods by road. For example, we are actively working with industry and the standards writing bodies to reduce the likelihood of highway tank rollovers. Research programs targeting improved safety requirements will improve the safety of dangerous goods shipments and reduce the likelihood of spills that can lead to injuries and death, cause major traffic disruptions and harm the environment.

Dangerous goods inspectors in Canada work tirelessly to ensure movements of dangerous goods are done in a safe and secure manner. With the dedicated resources of a small group of experts from CANUTEC, means of containment specialists and remedial measures specialists, Transport Canada can provide effective oversight in many areas that ensure the safe transport of dangerous goods in Canada.

HIGHWAY CARGO TANK VENT AND BURN
MCBRIDE (DOME CREEK) INCIDENT 2011

... cont'd

THE LIQUEFIED PETROLEUM GAS EMERGENCY RESPONSE CORPORATION

The Liquefied Petroleum Gas Response Corporation's mission is to provide a level of service to ERAP plan participants that will encompass well trained and qualified people, quality equipment, knowledgeable advice and timely assistance to allow responders to deal effectively with a liquefied petroleum gas emergency.

The Liquefied Petroleum Gas Response Corporation's response personnel are trained in the handling, storage and/or transportation of liquefied petroleum gas products and containers. The Liquefied Petroleum Gas Response Corporation's response personnel also participate in simulation exercises involving liquefied petroleum gas in order to receive hands on experience.

Additional information regarding the Liquefied Petroleum Gas Response Corporation can be found at the following website: *http://www.lpgerc.ca/lpgerc/index.asp*.

The vent and burn technique may be a viable response option for some liquefied petroleum gas incidents, under a very specific and limited fact pattern. Additional information pertaining to the vent and burn technique can be found in the Transport Canada publication entitled *Emptying Tanks of Liquefied Petroleum Gases Research Using Conical Shaped Charge Explosives For Vent and Burn Operations Prepared by Transport Canada Transport Dangerous Goods* and authored by Doug Kittle, May 2010.

TRANSPORTING GASOLINE AND THE *TRANSPORTATION OF DANGEROUS GOODS REGULATIONS*

BY JEAN-LÉON MORIN

If you've ever paid attention to dangerous goods safety marks on vehicles around you, chances are you've noticed how regularly "UN1203 – Gasoline" can be seen. What's even more amazing is the quantity of gasoline transported on our roads when we consider vehicle fuel tanks and gasoline transported in cases where safety marks are not required, for example in jerry cans, boat fuel reservoirs, equipment fuel tanks, etc. It is no secret that gasoline is one of the most common dangerous goods in transportation. Everywhere we go, we can encounter hundreds, even thousands of litres of gasoline in transportation, on a daily basis.

Transport Canada regulates the safe transportation of gasoline in various ways; by making regulations on vehicle crashworthiness and fuel system safety, under its Road Safety directorate, as well as through the *Transportation of Dangerous Goods Regulations*.

The *Transportation of Dangerous Goods Regulations* are in place to minimise the risks associated with the transportation of dangerous goods. These Regulations do not apply to gasoline in a vehicle fuel tank, but do apply to gasoline being handled for transport or transported from one location to another.

Depending on the case, the Regulations may require that a person:

- Use an appropriate container to contain the dangerous goods
- Ensure that there is no leaking under normal conditions of transportation
- Display safety marks on the container or vehicle, to warn of the presence of danger
- Obtain training on handling or transporting the dangerous goods
- Employ emergency response plans

Although most people understand that gasoline is dangerous due to its flammability, few understand that it is gasoline vapours that pose the real danger. It is these vapours, released from the liquid, that will ignite and burn or explode. This creates heat, causing additional vapours to be released, continuing the process.

The temperature at which a flammable liquid will release a vapour is called the "flash point". The flash point of gasoline is approximately -38 degrees Celsius. Therefore, at any temperature above this point, gasoline will produce vapours that can ignite and/or explode. For this reason, gasoline is regulated as a dangerous good, and is classified as a Class 3, Flammable Liquid, in accordance with international criteria.

In Canada, even when gasoline is transported for non-commercial purposes or for personal use, the *Transportation of Dangerous Goods Regulations* still apply. This differs from the United States, where dangerous goods are only regulated when "in commerce". However, the Regulations contain a number of exemptions, allowing gasoline to be transported without having to comply with all parts of the Regulations. There are a wide range of exemptions, each providing different levels of requirements. Some of the most commonly used exemptions for transporting gasoline include:

150 kg Gross mass exemption (section 1.15 of the *Transportation of Dangerous Goods Regulations*): The 150 kg gross mass exemption is the most commonly used exemption under the Regulations. In fact, most people use this exemption without even knowing it when transporting jerry cans. It can be used when you transport 150 kg or less total mass of gasoline, in containers that are 30 kg or less.

You can access the exemption by clicking on this link: *http://www.tc.gc.ca/eng/tdg/clear-part1-475.htm#sec115*.

500 kg Gross mass exemption (section 1.16 of the *Transportation of Dangerous Goods Regulations*): The 500 kg gross mass exemption is also used for gasoline transportation. It can be used when you transport 500 kg or less total mass of gasoline, in containers that are 30 kg or less, or in drums (see link for details).
In order to use this exemption:

- The person handling, offering for transport or transporting the gasoline would have to be trained in accordance with Part 6 of the Regulations,
- A spill would have to be reported in accordance with Part 8 of the Regulations.

You can access the exemption by clicking on this link: *http://www.tc.gc.ca/eng/tdg/clear-part1-475.htm#sec116*.

It is important to note that, when using any exemption or transporting under the *Transportation of Dangerous Goods Regulations*, the person transporting the dangerous goods must ensure that there is no leakage under normal conditions of transport. Although the exemptions do not specify what type of container must be used, an appropriate, gasoline resistant container should be used to ensure that no leakage occurs. Leakage of gasoline in transportation, in addition to being extremely dangerous, can also constitute a violation under the Regulations.

There are many more exemptions that can be used to transport gasoline, however, they contain more technical requirements. If you are transporting gasoline in quantities that exceed what is allowable under the exemptions detailed above, it is likely that you will be subject to some parts of the Regulations, and you may wish to contact a transport dangerous goods inspector in your region to obtain additional information regarding requirements for containers, training, etc.

CANUTEC

January 1, 2011 to August 31, 2011

SOURCE OF INITIAL EMERGENCY CALL

Shipper	18
Carrier	149
Consignee	2
Fire Department	203
Police	28
Hazmat Contractor	9
Poison Control Centre	11
Mutual Aid Group	7
Emergency Call Centre	30
Ambulance Service	6
Medical Facility	11
Laboratory	3
Government	76
Private Citizen	100
Manufacturing Facility	12
Distributor/Retail	4
End User	52
Other	11

EMERGENCIES BY LOCATION

British Columbia	102
Alberta	112
Saskatchewan	40
Manitoba	24
Ontario	217
Quebec	166
New Brunswick	14
Nova Scotia	11
Prince Edward Island	1
Newfoundland and Labrador	8
Yukon	0
Northwest Territories	1
Nunavut	1
United States	31
International	1

TOTAL NUMBER OF EMERGENCIES: 729

	Number of calls	Per 24hrs	% of total
Information	5,367	22	29
Regulatory	2,601	11	14
Technical	8,342	34	45
Other	2,033	8	11
Total	18,343	75	

EMERGENCIES BY TRANSPORT MODE

Road	203
Rail	107
Air	16
Marine	6
Pipeline	3
Non transport	391
Multimodal	3

EMERGENCIES BY CLASS OF DANGEROUS GOODS*

Class 1	Explosives	6
Class 2	Compressed Gas	157
Class 3	Flammable Liquids	192
Class 4	Flammable Solids	20
Class 5	Oxidizers and Organic Peroxides	39
Class 6	Poisonous and Infectious Substances	39
Class 7	Radioactives	8
Class 8	Corrosives	206
Class 9	Miscellaneous	9
NR	Non regulated	169
Mixed load		4
Unknown		12

*includes primary and subsidiary classes, and possibly multiple DG's per emergency.

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.

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Subscriptions are free of charge and available to anyone on request by calling 613-990-1148 or by visiting the TDG website at < ***http://www.tc.gc.ca/eng/tdg/newsletter-menu-268.htm*** >. This newsletter is also available at the same internet address. Please address comments and inquiries regarding additional information or publications to:

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Transport Canada Dangerous Goods Directorate Internet address
http://www.tc.gc.ca/eng/tdg/newsletter-menu-268.htm.