

**Report and Recommendations
of the
Transportation of Dangerous Goods
General Policy Advisory Council (GPAC)
Emergency Response Assistance Plan
(ERAP) Working Group
Relating to
Class 3 Flammable Liquids**

January 31, 2014

TO THE HONOURABLE MINISTER LISA RAITT
MINISTER OF TRANSPORT

January 31, 2014

Dear Minister

We, the members of the *Emergency Response Assistance Plan (ERAP) Working Group* of the Transportation of Dangerous Goods, General Policy Advisory Council, have the honour to submit to you our Report and Recommendations.

Respectfully submitted,

A handwritten signature in blue ink, appearing to read "C. J. Powers".

Fire Chief Chris Powers (Ret.)

Canadian Association of Fire Chiefs

(ERAP Working Group Lead)

Emergency Response Assistance Plan Working Group - Members

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Canadian Association of Fire Chiefs (CAFC)
Canadian Association of Petroleum Producers (CAPP)
Canadian Emergency Response Contractors Alliance (CERCA)
Canadian Fertilizer Institute (CFI)
Canadian Fuels Association (CFA)
Canadian Propane Association (CPA)
Compressed Gas Association (CGA)
Federal-Provincial/Territorial Task Force on TDG (FPTF – TDG)
Federation of Canadian Municipalities (FCM)
Railway Association of Canada (RAC)
Shipping Federation of Canada (SFC)
Teamsters Union Canada (TUC)
Canadian Renewable Fuels Association (CRFA)
Transport Canada (TC)

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1 INTRODUCTION

Dangerous Goods are essential to maintaining the Canadian economy and industrial activity. The production, transportation and use of dangerous goods represent a significant amount of commercial activity and these products are being transported daily by road, rail, air and marine carriers. Ensuring these products reach their destination without incident is the primary goal of the Transportation of Dangerous Goods Act and Regulations. The safety of the public depends first and foremost on effective preventative measures in the form of legislation, enforcement, training and safe operating practices.

In those cases where accidents do occur and dangerous goods have been or may be released then other critical components of the Transportation of Dangerous Goods (TDG) safety system are utilized by the first responders. Those components are the Emergency Response Guidebook (ERG) and the Canadian Transport Emergency Centre (CANUTEC). Both of these are critical to providing guidance and assistance to firefighters and other first responders on how to best protect the public and mitigate the impact of the release. Thousands of firefighters from large cities to small volunteer departments have been trained to utilize the ERG and to contact CANUTEC as part of a dangerous goods response.

Emergency Response Assistance Plans (ERAP's) are an important component in assisting first responders, shippers and carriers in mitigating the effects of dangerous goods incidents.

1.1 EMERGENCY RESPONSE ASSISTANCE PLANS - TDG REGULATIONS PART 7

The TDG Regulations, Part 7, provides for development and implementation of *Emergency Response Assistance Plans (ERAP)*. The following information on the purpose and background on ERAPs is taken from the Transport Canada website:

1.1.1 Section 1: What is an ERAP

An ERAP or Emergency Response Assistance Plan is a plan that describes what is to be done in the event of a transportation accident involving certain higher risk dangerous goods. The ERAP is required by the Transportation of Dangerous Goods Regulations (TDGR) for dangerous goods that require special expertise and response equipment to respond to an incident. The plan is intended to assist local emergency responders by providing them with technical experts and specially trained and equipped emergency response personnel at the scene of an incident.

The ERAP will describe the specialized response capabilities, equipment and procedures that will be used to support a response to incidents involving high risk dangerous goods. The plan will also address emergency preparedness, including personnel training, response exercises and equipment maintenance. The ERAP plans supplement those of the carrier and of the local and provincial authorities, and must be integrated with other organizations to help mitigate the consequences of an accident. This integration is usually accomplished by working within an incident management system – usually an Incident Command System or ICS. The ICS is a system where multiple authorities and response organizations are integrated into a common organizational structure designed to improve emergency response operations. The Incident Commander is the person with overall responsibility for the response and is usually a senior member of the local fire or police department.

1.1.2 Section 2: Background

The requirement for an Emergency Response Assistance Plan (ERAP) can be traced back to recommendations made by Justice Grange following the enquiry into the 1979 Mississauga train derailment. This derailment caused the rupture of several rail cars, including chlorine and several propane tank cars. The

chlorine leak led to an evacuation of approximately 220,000 people, the largest peace time evacuation in North America at the time. The derailment clearly demonstrated a need for specialized response teams and equipment to provide support to first responders during major releases of high risk dangerous goods.

The Grange Commission Report recommended that any shipper of dangerous goods be required to have a Transport Canada approved emergency response plan to control releases of dangerous goods in the event of an accident.

1.1.3 Section 3: When is an ERAP required

Part 7 of the Transportation of Dangerous Goods Act 1992, requires that a person have an approved ERAP before offering for transport or importing certain dangerous goods above a quantity specified in Column 7 of Schedule I of the Transport of Dangerous Goods Regulations. If no number (or reference to a special provision) appears in column 7, an ERAP is not required. If a number appears in column 7 of Schedule I, then we must refer to Section 7.1 of the TDG Regulations.

1.1.4 Section 4: Who Requires an ERAP

A Transport Canada approved ERAP is required by a person who imports or offers for transport a dangerous good consignment that requires an ERAP. Note that for the purpose of the TDG Act and Regulations, a person includes an organization or company. The term “offer for transport” is defined in the TDG Regulations as follows:

Offer for transport means, for dangerous goods not in transport, to select or allow the selection of a carrier to transport the dangerous goods, to prepare or allow the preparation of the dangerous goods so that a carrier can take possession of them for transport or to allow a carrier to take possession of the dangerous goods for transport.

For example, the person that is allowing the carrier to take possession of the dangerous goods (i.e. the person who has the authority to allow access to the product) is offering for transport. There may be more than one person offering the same consignment for transport. The consignor is responsible to ensure the shipping document is in compliance with TDGR, including accurate ERAP information. If a producer/manufacture of the dangerous goods is involved in the offer for transport from their facility, they must use their ERAP since they are not permitted to use someone else’s plan.

Import is defined as follows:

Import means import into Canada, and includes transporting goods that originate from outside Canada and pass through Canada to a destination outside Canada, except when the goods are being transported on a ship or aircraft not registered in Canada.

The importer in Canada is usually the person who is receiving the goods or who is causing the dangerous goods to enter Canada.

If product is transiting through Canada, each carrier that takes possession of the dangerous goods becomes an importer as per the definition of import above (including a Canadian port since they have possession of the dangerous goods for the purpose of transportation). This ensures that there will always be someone in Canada responsible for the ERAP requirement. An ERAP will only be registered to a company that is established in Canada. If, for example, a US based carrier requires an ERAP because the dangerous goods being transported are transiting through Canada, the carrier will have to obtain a power of attorney with an agent in Canada in order to register the ERAP. The power of attorney will ensure that the US based company is subject to Canadian legislation. Similarly, a US based company that is offering for transport may register an ERAP through a power of attorney.

2 TRANSPORTATION OF CRUDE OIL BY RAIL

The development of hydraulic fracking and the continuing need to develop North American energy resources has resulted in large scale production of crude oil from the Bakken formation which underlies parts of Montana, North Dakota, Saskatchewan and Manitoba. In Alberta, the Athabasca oil sands are a source of large quantities of heavy crude oil (bitumen).

Traditionally most crude oil produced in North America was transported by pipelines. Because of the lack of pipelines or pipeline capacity the transportation of crude oil by rail has become an important means of moving this product to refineries. Information from the *Railway Association of Canada (RAC)* indicates that shipments of crude by rail have risen exponentially in recent years. In 2009, Class I railways moved only 500 carloads of crude, while current estimates are in the range of 130,000 – 140,000 carloads per year. With an estimated average of 600 barrels per carload, that amounts to about 230,000 barrels per day. The continuing development of these oil reserves is expected to result in an even greater volume of crude oil being transported by rail in future years.

2.1 LAC MEGANTIC - DERAILMENT AND FIRE

On July 6th, 2013 a 73-car Montreal, Maine & Atlantic train carrying Bakken crude oil rolled away from where it had been parked and derailed in downtown Lac-Mégantic. The train had been parked uphill of Lac-Mégantic, approximately 11 km. west of town, at Nantes Quebec, before it ran away and rolled downhill into the town. The unmanned train derailed in an area near the grade crossing where the rail line crosses Frontenac Street, the town's main street. The train may have been moving at up to 100 kilometres per hour. The equipment that derailed included 63 of the 72 tank cars as well as the buffer car. The 9 tank cars at the rear of the train remained on the track and were pulled away from the derailment site and did not explode.

The Lac Megantic fire service responded to this incident and asked for and received mutual aid assistance from numerous fire departments in Quebec and the State of Maine. Hundreds of firefighters were eventually deployed for many days and most were volunteer firefighters. The large volume of fire and the heat generated created tremendous safety risks for these firefighters. After 20 hours, the center of the fire was still inaccessible to firefighters and pools of fuel were still burning. Firefighting foam was brought from an Ultramar refinery in Lévis Quebec and was used to control remaining fire and suppress vapors from unburned crude oil. The Chaudière River was contaminated by hundreds of thousands of liters of oil as was the sewer system and soil in the vicinity of the derailment.

This incident resulted in the death of forty seven (47) individuals and destruction of the downtown core of the town. The financial costs will run into the hundreds of millions of dollars.

The tragedy in Lac Megantic has focused attention on the impact of dangerous goods incidents on public safety. The incident in Lac Megantic is so overwhelming in scale and devastation that it is difficult to comprehend how a small community can begin to cope and recover.

There are many lessons to be learned from this tragedy and the government has already taken action to strengthen railway operating practices when dangerous goods are being transported, requiring testing of crude oil to determine the characteristics and potential dangers posed by the various crude oils being transported and has required railways to provide municipalities with information on a yearly basis (or

immediately in event of a significant change) on the type, volume and nature of dangerous goods being transported through their community. Additional changes are anticipated as more work is being carried out on many fronts to identify and reduce risks of further incidents.

2.2 TRANSPORTATION SAFETY BOARD

The Transportation Safety Board (TSB) is conducting an extensive investigation into the Lac Mégantic incident. Until a final report is released all the contributing factors are not known. The measures implemented by the federal government to date are in response to some early recommendations from the TSB. The TSB has stated:

“In analysing product samples from the 9 intact tank cars from the Lac-Mégantic accident, the TSB identified the product as having the characteristics of a Dangerous Good of Class 3, PG II product. However, the product was offered for transport, packaged, and transported as a Class 3, PG III product, which represented it as a lower hazard, less volatile flammable liquid.”¹

On January 23, 2104, the TSB issued additional Rail Safety Recommendations

2.2.1 TSB Rail Safety Recommendations, 23, January, 2014

“As part of its ongoing investigation into the Lac-Mégantic accident, the TSB has identified three key safety issues that must be addressed to further improve the safety of the Canadian rail system:

- *vulnerability of Class 111 tank cars to sustain damage,*
- *route planning and analysis for trains carrying dangerous goods, and*
- *requirements for emergency response assistance plans.”²*

2.2.2 Requirements for emergency response assistance plans (R14-03)

“An Emergency Response Assistance Plan (ERAP) is required by the Transportation of Dangerous Goods Regulations for certain goods that pose a higher-than-average risk when transported in certain quantities. When there is an accident, the handling of these dangerous goods requires special expertise, resources, supplies and equipment. An approved ERAP will describe the specialized response capabilities, equipment and procedures that will be available to local emergency responders and will assist emergency responders in addressing the consequences of the accident.”

“The risks posed by specific dangerous goods are determined based on the properties, characteristics and quantities of the dangerous goods being transported. Importers, as well as persons who offer for transport a dangerous good that requires an ERAP, must have an ERAP approved by TC.”

Previous recommendation

Following the TSB investigation into the 1999 derailment, collision and subsequent fire of a CN unit train carrying flammable liquid hydrocarbons in tank cars near Mont-Saint-Hilaire, Quebec (TSB report R99H0010), the Board determined that a comprehensive emergency response plan, where roles, resources

¹ Transportation Safety Board News Release, September 11, 2014

² Transportation Safety Board, Rail Safety Recommendations, 23, January 2014, pg. 2

and priorities for emergency response are defined ahead of time, would enhance the emergency response and alleviate post-accident risks. The Board recommended that:

Transport Canada review the provisions of Schedule I and the requirements for emergency response plans to ensure that the transportation of liquid hydrocarbons is consistent with the risks posed to the public. (R02-03, issued June 2002)

*The Transportation of Dangerous Goods Regulations were amended to require an approved ERAP for 3 flammable liquids (UN 1202, diesel fuel; UN 1203, gasoline; and UN 1863, aviation fuel) when offered for transport or imported in a specific configuration of 17 or more **interconnected rail tank cars** that are each at least 70% full.*

As part of its assessment of Recommendation R02-03, the Board noted that the updated ERAP application criteria, as implemented by TC, did mitigate the risks to the public posed by the transportation of large volumes of liquid hydrocarbons that were, at that time, regularly transported between Québec and Montréal in interconnected tank cars. The Board therefore assessed Recommendation R02-03 as Fully Satisfactory in August 2008.

Emergency response assistance plans

In the Lac-Mégantic accident, following confirmation that the dangerous goods involved in the fire consisted of petroleum crude oil, the emergency responders assessed the situation and estimated that approximately 33 000 litres of foam concentrate would be required to allow a continuous uninterrupted production of foam to be applied to the fire. As that quantity of supply was not available locally, the Lac-Mégantic Fire Department arranged to transport the foam concentrate from a refinery in Lévis, Quebec, about 180 km away.

In this accident, the relative proximity of the refinery, the availability of the required type and quantity of foam concentrate and the capability to deliver it to Lac-Mégantic in a timely manner provided the firefighters with one of the critical materials to successfully fight the large hydrocarbon fire. However, if this accident had occurred in a community in Canada where supplies and other specialized resources were not available in a timely manner, the emergency response efforts would have been jeopardized.

The transportation of large volumes of flammable liquids, such as petroleum crude oil, does not currently require an ERAP. However, approved ERAPs would consistently ensure that first responders have access, in a timely manner, to the required resources and assistance in the event of an accident involving significant quantities of flammable hydrocarbons.

In November 2013, an Emergency Response Working Group (Working Group) was established by the Transportation of Dangerous Goods General Policy Advisory Council. The Working Group is chaired by the Canadian Association of Fire Chiefs and is tasked to examine the possibility of extending the ERAP program to include flammable liquids such as crude oil or to recommend other viable emergency response solutions to accomplish a similar goal of ensuring access to appropriate response capability and specialized supplies. The Working Group's recommendations are expected to address short-term or longer-term solutions or actions that TC can take to enhance emergency response. The Board acknowledges this TC initiative. Given the significant increase in the quantities of crude oil being transported by rail in Canada, and the potential for a large spill with the risks it would pose to the public and the environment, the Board recommends that, at a minimum:

The Department of Transport require emergency response assistance plans for the transportation of large volumes of liquid hydrocarbons. R14-03³

³ Transportation Safety Board, Rail Safety Recommendations, 23, January 2014, Pg. 9 – 11.

3 TDG GENERAL POLICY ADVISORY COUNCIL AND WORKING GROUPS

At the meeting of the TDG General Policy Advisory Council (GPAC) on Nov. 21st. Minister of Transport Lisa Raitt identified the concerns of the federal government with respect to the urgent need to make improvements to help ensure safe transportation of dangerous goods. To that end the Minister requested that members of GPAC participate in subject specific Working Groups to make recommendations for consideration by Transport Canada and the government to improve public safety.

Three (3) Working Groups were established at the meeting and designated as:

- 1) Emergency Response Assistance Plan (ERAP) Working Group
- 2) Classification Working Group
- 3) Means of Containment Working Group

The Minister indicated she wanted a report with recommendations from each of the Working Groups by the end of January 2014.

3.1 EMERGENCY RESPONSE ASSISTANCE PLAN WORKING GROUP

Given the short time frame and the limited availability of members during the holiday season the Working Groups needed to focus on identifying primary areas of concern and establishing basic foundations upon which recommendations could be formulated. Members of the ERAP Working Group made themselves available for a teleconference on December 18th. 2013. During that meeting the objectives of the WG were discussed and it was agreed to continue with teleconference meetings weekly beginning on January 10th. Members were requested to submit written positions, suggestions or concerns that could be included in the minutes and circulated to members prior to the Jan 10th. Meeting.

All members of the ERAP Working Group understand and support the overarching objectives of the First Responders. There is a need of having an effective and capable emergency response plan in place, with the required information and equipment being available as part of being prepared for an emergency. The working group understands the need for regulations to ensure that these plans are in place.

4 CRUDE OIL AND OTHER FLAMMABLE LIQUIDS – FIRE RISKS

4.1 CRUDE OIL

Crude oil is classified as a Class 3 Flammable Liquid under TDG Regulations which are based on the United Nations Classification System for dangerous goods. Crude oil is a liquid hydrocarbon that is refined for use in many different products including gasoline, diesel fuel, kerosene, jet fuel, and liquefied petroleum gas (LPG) as well as heavy fuel oil, lubricating oil, etc.

Until the Lac Megantic incident and then subsequent derailments and fires in November 2013 in Pickens County Alabama, December 30th 2013 near Casselton, N.D and again on January 7th, 2014 near Plaster Rock N.B., crude oil was not generally expected to be highly dangerous. As we now know, some crude

oils, (particularly the Bakken crude) are a very light volatile type of crude that acts more like refined products such as gasoline when involved in fire and has a low viscosity. It also contains a variety of other chemicals such as benzene and hydrogen sulfide, creating additional dangers to first responders.

On January 2nd. 2014, following the derailment and fire at Casselton N.D. the U.S. Pipeline and Hazardous Materials Safety Administration (PHMSA) issued a warning about the dangers posed by Bakken Crude oil.

4.2 OTHER FLAMMABLE LIQUIDS

Another Class 3 Flammable Liquid that is transported in large volumes by rail is ethanol. Ethanol (UN 1170) is a polar solvent (water – miscible) produced primarily from corn and wheat for use as a renewable fuel. Ethanol (UN 1170) is commonly added to Gasoline (UN 1203) in proportions of 10%. In some instances ethanol is added to gasoline at higher percentages and in those cases gasoline is classified as (UN 3475). That classification indicates to first responders that fires involving that product require the use of an alcohol resistant foam to extinguish the fire.

Information provided to the ERAP WORKING GROUP by the *Canadian Renewable Fuels Association* indicate that in 2013, Canada produced 1.8 billion litres of ethanol of which most was transported by truck. They also indicated that over 1 billion litres of ethanol is imported to Canada each year primarily by rail.

In addition to the ethanol produced / imported for use in Canada identified above, the Canadian Pacific Railway has advised that there are unit trains of ethanol (and crude oil) which transit Canada, moving U.S. ethanol and crude oil from the U.S. and back to U.S. destinations. These “bridge traffic” rail movements need to be included in the risk assessment for those communities along the transportation route of these or other trains moving flammable liquids which do not originate or terminate in Canada.

5 FIREFIGHTING CHALLENGES FOR FLAMMABLE LIQUID FIRES (CLASS B FIRES)

Flammable liquids, as a class of dangerous goods, represents significant challenges to the municipal fire service when involved in a fire and as larger quantities are released the scale of those challenges are magnified. Most municipal fire services are trained and equipped to fight structural fires involving primarily ordinary combustibles materials (Class A Fires) such as wood, paper, fabric, etc. with water being used to extinguish those fires.

Large flammable liquid fires (Class B fires) resulting from transportation incidents are very difficult or impossible for municipal fire services to extinguish. Examples of these types of fires would be those resulting from accidents involving release of large quantities of flammable liquids such as the 70,000 Liters carried in TC406 Super-B combination unit Tank trailers or the approximately 131,000 liters carried in rail tank cars such as the DOT 111 tank car. In many cases fire control is only achieved after the majority of product has burned off.

Extinguishing flammable liquid fires requires the use of firefighting foam such as Aqueous Film Forming Foam (AFFF) or Alcohol Resistant - Aqueous Film Forming Foam (AR- AFFF). To be successful in achieving extinguishment the foam concentrate must be inducted or injected and mixed with water at the correct ratios (usually 3% - 6%), aerated and applied correctly so as not to agitate the flammable liquid. The

foam solution (water and foam mixture) must be applied at a rate sufficient to overcome the heat being generated by the fire and be able to blanket the surface of the flammable liquid.

The resources (sufficient quantities of the correct foam concentrate, foam pumps or eductors, foam aerating nozzles etc.) and the specialized training are not found in most municipal fire departments. Historically the low frequency of large flammable liquid fires has not justified the costs involved in equipping and training for this type of firefighting. Limited funding of most fire departments (large and small) will not permit them to even consider attempting to acquire this specialized equipment.

6 ERAP'S FOR FLAMMABLE LIQUIDS

6.1 ERAP OR ALTERNATIVE PROGRAMS

The mandate of the ERAP Working Group is to consider the application of ERAP's or other types of emergency response plans for crude oil and other flammable liquids. Some members of the ERAP Working Group suggested alternative approaches to providing an acceptable emergency response program including considering Special Provisions under TDG Regulations or adopting similar voluntary existing programs. Some programs mentioned for consideration included the *Chemical Industry Association of Canada - TEAPIII - Transportation Emergency Assistance Plan III*, the *Marine Response Organization*, the *Liquefied Petroleum Gas - Emergency Response Corp (LPG – ERC)* and the *Western Canadian Spill Services*.

In discussion with the representative of the *Canadian Emergency Response Contractors Alliance (CERCA)* it was clarified that CERCA member companies use the *TEAPIII* program to verify the qualifications of a member company to meet identified standards. *TEAPIII* is not a response program. The CERCA members for the most part are not trained or equipped for flammable liquid firefighting and their role at flammable liquids incidents would be primarily transfer and clean-up of product once a fire is extinguished by municipal firefighters. CERCA members are contracted by ERAP holders to respond to dangerous goods incidents for which they are qualified.

The *Liquefied Petroleum Gas - Emergency Response Corp (LPG – ERC)* provides response teams and Remedial Measures Advisors (RMA's) as part of the ERAP requirement for LPG incidents, but do not currently provide flammable liquids firefighting resources.

Both the *Federation of Canadian Municipalities* and the *Canadian Association of Fire Chiefs* have indicated that an ERAP under Part 7 of the TDG Regulations would be the only option that meets their expectations. The benefits and considerations for using the existing ERAP approach as the recommended system were identified by the FCM in their position paper which is included in the Appendix.

6.2 WORKING GROUP DISCUSSION AND RECOMMENDATION ON ERAP

During the teleconference on January 10th 2014 most of the meeting was devoted to a discussion on the pros and cons of recommending the use of Part 7 of the TDG Regulations to develop an ERAP appropriate for crude oil and other flammable liquids. A number of concerns were raised with the existing ERAP

program and the members expect that Transport Canada will need to make adequate investment by providing sufficient resources to address these concerns. The ERAP Working Group does not want to see a “paper solution” to the issue and not have a solid and reliable program with adequate resources, trained personnel and verified qualifications.

It is not clear if the TDG Directorate presently has sufficient resources to approve, inspect and maintain the ERAP’s that are now in place or new ones that will result if flammable liquids become ERAPable. Continuing budget reductions have had a major impact on the TDG Directorate and it is most likely that new funding will be needed to manage the additional work load that will result if ERAP’s are legislated for flammable liquids.

Representatives of the *Canadian Association of Petroleum Producers (CAPP)* and *Canadian Fuels Association (CFA)* (the “Petroleum Industry”) continue to have concerns with respect to the implications of using ERAP under Part 7 and the effectiveness of that program in ensuring a working emergency response. Their position on this is detailed in the Appendix in their letter to the ERAP WORKING GROUP dated January 16, 2014.

The majority of the ERAP WORKING GROUP members did agree that the TDG Part 7 *Emergency Response Assistance Plan (ERAP)* program was the most appropriate means to address the concerns raised by Federation of Canadian Municipalities, the Canadian Association of Fire Chiefs and the government, to provide an emergency assistance plan for Class 3 Flammable Liquids and one that is supported by legislative requirements and subject to specified standards, inspection and audit.

This recommendation is consistent with the comments from the TSB January 23, 2014, report:

“In November 2013, an Emergency Response Working Group (Working Group) was established by the Transportation of Dangerous Goods General Policy Advisory Council. The Working Group is chaired by the Canadian Association of Fire Chiefs and is tasked to examine the possibility of extending the ERAP program to include flammable liquids such as crude oil or to recommend other viable emergency response solutions to accomplish a similar goal of ensuring access to appropriate response capability and specialized supplies. The Working Group’s recommendations are expected to address short-term or longer-term solutions or actions that TC can take to enhance emergency response.”

7 WHAT CLASS 3 FLAMMABLE LIQUIDS SHOULD REQUIRE AN ERAP?

The behaviour of the crude oil that exploded at Lac Megantic was unexpected as it reacted more like gasoline than the way “traditional” crude oil should be expected to react under fire conditions based on past experience. The Transportation Safety Board has subsequently confirmed that the crude involved was mislabelled as a dangerous good Class 3 Flammable Liquid Packing Group III, instead of Packing Group II with a lower flash point.⁴

On October 17, 2013 Transport Canada announced Protective Direction 31 under the Transportation of Dangerous Goods Act requiring any person who imports or offers for transport crude oil to conduct classification tests on crude oil. Until such testing is completed, when shipping by rail all such crude oil

⁴ TSB News Release Sept. 11, 2013

shall be identified as Class 3 Flammable Liquid Packing Group I – the designation with the lowest flash point.

On September 6, 2013, the US Pipeline and Hazardous Materials Safety Administration (PHMSA) announced it is seeking public comment within 60 days on its Advance Notice of Proposed Rulemaking (ANPRM) that is intended to further enhance the safe transportation of hazardous materials by rail tank cars⁵. One of the five proposed amendments would “*impose additional requirements that would enhance the standards for DOT Specification 111 tank cars used to transport Packing Group (PG) I and II hazardous materials*”. While this is a US initiative, it will have direct consequences in Canada through likely harmonization.⁶

The *CLASSIFICATION WORKING GROUP* is currently studying the properties of various crude oils and test methods to provide accurate and certified testing to determine the physical and chemical properties. Subject to the findings and recommendations of the *CLASSIFICATION WORKING GROUP* the application of ERAP requirements to crude oil could vary substantially. It is therefore necessary to look at what criteria exist for Class 3 Flammable Liquids under TDG Regulations as the baseline for establishing higher risk dangerous goods that the ERAP program was designed to address.

7.1 TDG REGULATIONS PART 2 CLASSIFICATION - PACKING GROUPS

The Packing Group (PG) is assigned based on the degree of danger presented by the hazardous material:

PG I: Great Danger

PG II: Medium Danger

PG III: Minor Danger⁷

The TDG Regulations address Class 3, Flammable Liquids as requiring different Packing Groups based on the following section of Part 2:

2.19 Packing Groups

(1) Flammable liquids included in Class 3, Flammable Liquids, are included in one of the following packing groups:

- (a) Packing Group I, if they have an initial boiling point of 35°C or less at an absolute pressure of 101.3 kPa and any flash point;
- (b) Packing Group II, if they have an initial boiling point greater than 35°C at an absolute pressure of 101.3 kPa and a flash point less than 23°C; or
- (c) Packing Group III, if the criteria for inclusion in Packing Group I or II are not met.

(2) Despite subsection (1), for dangerous goods included in Class 3, Flammable Liquids,

⁵ Federal Register, Vol 78, No 173, September 6, 2013, Proposed Rules.

⁶ Canadian Transportation Research Forum (CTRF) - Rail Safety In Transporting Dangerous Goods In Canada Jan. 13, 2014

⁷ 2012 Emergency Response Guidebook, pg. 379

- **(a)** when the packing group is unknown, the consignor may include the dangerous goods in Packing Group I; or
- **(b)** when the packing group is reasonably believed or is known to be Packing Group II or III, the consignor may include the dangerous goods in Packing Group II but, if the substance has the same characteristics as UN1203, GASOLINE, it may also be transported as Packing Group II

(3) Despite paragraph (1)(b), a viscous substance that has an initial boiling point greater than 35°C at an absolute pressure of 101.3 kPa and a flash point less than 23°C may be included in Packing Group III if

- **(a)** the substance or any separated solvent does not meet the criteria for inclusion in Class 6.1 or Class 8;
- **(b)** the substance meets the Packing Group III criteria of the solvent separation test in section 32.5.1 of Part III of the Manual of Tests and Criteria; and
- **(c)** the substance
 - **(i)** has been tested in accordance with either ASTM D 1200 or ISO 2431, and
 - **(ii)** has a kinematic viscosity, measured as flow time, that is within the range shown in column 3 of the following table, using a jet with the diameter shown in column 2 for the corresponding flash point in column 1.

The information from the TSB and from the US Pipeline and Hazardous Materials Safety Administration (PHMSA) as well as the requirements of Transport Canada Protective Direction 31 indicate that products which require Packing Group I or II are considered of significant risk and are subject to the various actions being considered.

The experience in the three (3) derailments and flammable liquid fires in Eastern Canada - the 1999 St. Hilaire, Quebec incident, the July 6th. 2013 Lac Megantic incident and the January 7th. 2014 Plaster Rock N.B. all burned for several days and required that foam supplies be made available before extinguishment could be achieved. These foam supplies came primarily from refineries. This reinforces the necessity to have ERAPs in place for Packing Group I and II flammable liquids. Petroleum companies handling this product at their facilities are an important resource for this specialized material and technical personnel, however the limited number and location of refineries means that other additional resources will also be required to provide coverage across the country. While railways and municipalities may have some limited capacity with foam inventory neither currently have the expertise or resources that are found with the petroleum industry for flammable liquid fire control. One Canadian Class 1 railway has acquired six (6) foam trailers as a step towards improving response capacity, which is commendable, however a comprehensive plan is needed to develop a national flammable liquid emergency response network.

7.2 SPILL RISKS FROM PACKING GROUP III FLAMMABLE LIQUIDS AND OTHER LIQUID HYDROCARBONS

Both the Federation of Canadian Municipalities and the Canadian Association of Fire Chiefs have expressed the position that all flammable liquids should be subject to ERAP requirements including Packing Group III products. The Railway Association of Canada has also indicated that one option they would recommend is that any load of Class 3 product be transported under ERAP protection. Among the reasons for this position is the concern that while these products may not have the same risk of fire and explosion they can still present a serious environmental hazard or risk to personnel from gases or vapors, etc. that may be present.

An example is the extensive damage caused by the August 2005 derailment of 43 cars of a CN train at Lake Wabamun, Alberta. About 800,000 litres of heavy oil (Bunker C) and pole-treating oil were spilled in the derailment and approximately 196,000 litres entered the lake. At that time, spill control and containment resources for spills into waterways were very limited in the interior of the country. Most booms and associated equipment were located on the east or west coast. Since that time additional resources are reported to be available for this type of incident.

Having spill containment resources available for initial mitigation efforts would be of significant assistance during the early stages of large hydrocarbon spills. This could be accomplished using an ERAP designed to assist with initial spills containment.

Environmental protection is the reason that the marine transportation of crude oil has resulted in legislation and development of a comprehensive program to protect the environment from spills. The representative of the *Shipping Federation of Canada* has provided the ERAP Working Group with information on the *Canada Shipping Act, 2001*, and the *Response Organizations and Oil Handling Facilities Regulations* that outline the procedures, equipment and resources of response organizations and oil handling facilities for use in respect of an oil pollution incident.

It is recommended that ERAPs be required for all Packing Group I and Packing Group II, Class 3 Flammable Liquids in accordance with TDG Regulations Part 7.

Furthermore, it is recommended that Transport Canada conduct further study on the properties of other Class 3 Flammable Liquids to determine if ERAPs should be required for these products.

8 WHEN IS AN ERAP REQUIRED?

Transport Canada provides the following guidance on when an ERAP is required:

Part 7 of the Transportation of Dangerous Goods Act 1992, requires that a person have an approved ERAP before offering for transport or importing certain dangerous goods above a quantity specified in Column 7 of Schedule I of the Transport of Dangerous Goods Regulations. If no number (or reference to a special provision) appears in column 7, an ERAP is not required. If a number appears in column 7 of Schedule I, then we must refer to Section 7.1 of the TDG Regulations.

When discussing various options on volumes of flammable liquids that should or should not be required to have an ERAP, the representative from Canadian Pacific Railway explained that as the railway picks up tank cars to build trains or sets them off, there would be no practical way to manage a change in requirements for an ERAP if it was not established at the time of shipment based on a single tank car.

There presently exists a Special Provision under TDG Regulations Part 7 (6) an ERAP requirement for some flammable liquids.

*Subsection (6) deals with tank cars in a single train that contain dangerous goods included in Class 3, Flammable Liquids, and that have the UN number UN1202, UN1203 or UN1863.
SOR/2011-239*

- (6) A person who offers for transport or imports, in a single train, rail tank cars that contain dangerous goods having the UN number UN1202, UN1203 or UN1863 must have an approved ERAP if
- (a) the rail tank cars are interconnected in such a way that the loading or unloading of more than one rail tank car can be done from the first or last of those rail tank cars; and
 - (b) 17 or more of the rail tank cars are each filled to 70 per cent or more of their capacity.

SOR/2011-239

The representative from Canadian National Railway explained that *Section 7 (6) (a) and (b)* which specifies 17 or more interconnected rail tank cars was because this requirement applied only to the “Ultratrain” that has specially designed tank cars that were interconnected in blocks of 17 cars.

It appears that based on the comments from the railways representatives the only practical way for the ERAP program to work would be to base it on a tank car load of product, approximately 130,000 liters. Many other dangerous goods require ERAP’s for substantially less quantities due to their very high risk but in rail transport they are shipped in car load lots in any event.

The ERAP Working Group recommends the volume of product shipped in a single loaded tank car as the only practical standard for requiring an ERAP for flammable liquids being transported by rail.

9 KNOWLEDGE OF AND ACTIVATING AN ERAP

An area identified as a problem by the representative of the *Federal / Provincial / Territorial Task Force on TDG* was that when an incident occurs (especially a rail incident), the ERAP number and activation phone number are often not readily available to first responders. Without that information, the ERAP cannot be activated. Further, there is no legal requirement which outlines whose responsibility it is to activate the ERAP and/or when it needs to be activated.

If first responders are not aware of the existence of an ERAP for a product or if they are aware of the ERAP but it is not activated because it is not clear who has the authority to activate it, then it is of little value.

Transport Canada TDG Directorate representatives acknowledged that there may be a need to revise the language in the regulations to clarify this aspect of the ERAP activation criteria.

One option to improve awareness of ERAP’s by first responders is to consider including in the next edition of the *Emergency Response Guidebook* a section on the ERAP program in Canada and also to provide a symbol in the guide for those dangerous goods that require ERAP’s in Canada, in the same fashion as the *Green Highlight* is provided for Toxic Inhalation Hazard (TIH) dangerous goods.

It is recommended that improved awareness by first responders of the existence of an ERAP for a shipment of dangerous good be considered as an important component of the information sharing and be included in dangerous goods training programs. Information on the ERAP program should be included in the next edition of the *Emergency Response Guidebook*.

It is recommended that ERAP regulations be revised to clarify who has the authority to activate an ERAP and that first responders be authorized to request CANUTEC to activate an ERAP if it is not done by the carrier in a timely manner.

10 CO-OPERATIVE APPROACH FOR A FLAMMABLE LIQUIDS ERAP PROGRAM

While there are many existing ERAP's in place for a wide variety of dangerous goods only a few exist for flammable liquids such as that covered by Special Provision under Section 7.1 (6) that was designed to apply only to the "Ultratrain" for Fuel Oil (UN 1202), Gasoline (UN 1203), and Aviation Fuel (UN 1863). ERAP's are also in place for some flammable liquids that are also toxic, such as for Carbon Disulfide (UN 1131) which is a toxic flammable liquid and requires an ERAP.

Most response organizations for dangerous goods incidents do not have the training or equipment for flammable liquid firefighting. Flammable liquids also require significantly more resources (personnel, foam, equipment, water supply, etc.) than is required for many other dangerous goods releases. Therefore it is a significant challenge to build a Canada-wide response capacity for these products. It would also be costly and inefficient if every shipper/ importer or carrier developed their own ERAP and resource base.

A number of ERAP Working Group members recommended a co-operative approach that would allow a minimum of new ERAP's to be developed with response capacity coming from a single entity. The *Liquefied Petroleum Gas Emergency Response Corp.* (LPGERC) is a non-profit corporation that provides an emergency response system which provides certified Response Teams and equipment for Plan Participant members all across Canada who require an ERAP for various LPG products. The LPGERC or a similar system could be adopted for higher risk flammable liquid emergency response. There are also other co-operative response organizations that can serve to help design a single cost effective flammable liquid response capacity across Canada. The Marine Organization for spills response and / or the *Western Canadian Spill Services* (WCSS) may be models to be referenced to help in the development of a flammable liquids response capacity through a centralized organization funded by the shippers and carriers. It is however up to the shippers and carriers to decide on the best means to provide the qualified personnel and other resources to meet the requirements set out in the ERAP.

It is recommended that a co-operative approach be used for the Flammable Liquids ERAP that would permit new ERAP's to be developed with response capacity coming from or managed by a single entity as the most cost effective and efficient way to comply with the regulations.

11 TIME CONSTRAINTS AND THE REQUIREMENT FOR MORE INFORMATION AND DATA

The members of the ERAP Working Group recognize that there is an urgent need to identify and implement an effective response to the dangers presented by large spills of flammable liquids such as the highly volatile Bakken crude oil, ethanol and other products. The public need assurance that in the event of another incident a plan and resources are in place to mitigate the impact of the incident on lives, property and the environment.

In the short time available to the ERAP WORKING GROUP it has not been possible to consider all the various contributing factors and analyze products volumes, transportation routes, communities at risk as well as existing resources and gaps. Lack of available data on dangerous goods movements and also on resources available for emergency response limits the ability of the ERAP WORKING GROUP provide a comprehensive analysis of what is required and the time needed for implementing an ERAP program for flammable liquids across Canada.

11.1 COMMUNITIES AT RISK - ORIGIN AND DESTINATION, CLASSIFICATION AND VOLUME DATA

The ERAP Working Group has discovered that there is an absence of data on the transportation of dangerous goods in Canada that is readily available for analysis. Transport Canada does not collect that information and while various producers, shippers, importers and carriers may have data specific to their operations it is not currently available to the ERAP WORKING GROUP. This means no one on the ERAP WORKING GROUP or at Transport Canada can quantify what dangerous goods are being transported, by what means and over what transportation corridors.

Without data on dangerous goods movements and volumes it is not possible to know what communities are at risk and to what degree. We don't know if emergency response resources are located within reasonable distances to respond or what products would be encountered on a more frequent basis. While most crude oil by rail could be moving from various U.S. and Canadian oil fields to refineries or terminals for export in Canada, some or possibly a lot of the volume may be transiting through Canada from the U.S and back again into the U.S. or from Canada to the U.S. Protective Direction 32 requiring railways to provide yearly reports to municipalities on the nature and volume of dangerous goods transported through the community will be an important source of data that can be used to help develop emergency response plans for these products.

In attempting to develop some basic data on movement of flammable liquids with origin and destination information *the Statistics Canada Table 404-0021 Rail transportation, origin and destination of commodities, annual (tonnes) (2007 – 2011)* was used to generate a report for shipments of gasoline and aviation turbine fuel and of fuel oils and crude petroleum showing relative volumes by region, as a guide to movements of these products. Unfortunately the data is out of date by two (2) years and since that time refineries in New Brunswick and Quebec have begun accepting shipments of crude oil by rail, which is an example of why municipalities need annual reports of dangerous goods movements as required by Protective Direction 32. The resulting table is shown in the Appendix. Given that this table ends in 2011, and looking at *StatsCan table S404-0002, Railway carloading statistics. From Oct 2012 to Oct 2013*, the number of cars shipping fuel oils and crude petroleum increased from 10,952 carloads in the month to 14,689, with metric tonnage increasing from 891,932 to 1,210,174.

See <http://www.statcan.gc.ca/pub/52-001-x/2013010/t002-eng.htm>.

According to the *Railway Association of Canada* in 2009, Class I railways moved 500 carloads of crude while current estimates are in the range of 130,000 – 140,000 carloads. With an estimated average of 600 barrels per carload, that amounts to about 230,000 barrels per day.

11.2 RESOURCE DATA FOR FLAMMABLE LIQUID FIREFIGHTING

The other area where data appears to be non-existent is on the existing inventories of equipment and supplies for flammable liquid firefighting. It would be expected that most of this material would be held by refineries for facility protection, while some additional limited resources could be available from municipal fire departments, DND bases and railways. Foam for the Lac Megantic incident came from the Ultramar refinery in Levis, Quebec and at the Plaster Rock incident apparently Irving Refinery in St. John N.B. provided material. Having data on volume and type of firefighting foam, application equipment, etc. as well as geographic locations would be necessary to determine what current capacity exists by region and what gaps exist.

The ERAP WORKING GROUP identified the lack of data as a serious constraint in providing detailed risk analysis and recommendations for addressing specific gaps in response capacities at any given community in Canada.

It is recommended that data be collected on the following:

- **Volumes, classification and transportation corridors for dangerous goods as required by Protective Direction 32**
- **Identify communities at risk along dangerous goods transportation corridors**
- **Identify existing flammable liquids firefighting resources by geographic area**
- **Identify gaps that exist and additional resources required.**

It is recommended that the mandate of the TDG Advisory Council ERAP WORKING GROUP on FLAMMABLE LIQUIDS be extended to continue to work on all aspects that are required to implement a national flammable liquids emergency response capacity and that Transport Canada provide funding to support the work of those non-profit associations on this ERAP WORKING GROUP.

This Task Force could consist of the primary stakeholders including the following:

- **Aboriginal Firefighters Association of Canada (AFAC)**
- **Canadian Association of Petroleum Producers (CAPP)**
- **Canadian Fuels Association (CFA)**
- **Canadian Association of Fire Chiefs (CAFC)**
- **Federation of Canadian Municipalities (FCM)**
- **Railway Association of Canada (RAC)**
- **Other stakeholders to be determined such as Canadian Emergency Response Contractors Alliance (CERCA), Transport Canada, etc.**

12 RELATED SUBJECT AREAS REQUIRING ACTION

The ERAP program address a comprehensive list of areas that must be part of the plan for it to be approved. The *Canadian Association of Fire Chiefs* (CAFC) and the *International Association of Firefighters* (IAFF), identified some specific areas that they believe need to be given greater attention and are not addressed elsewhere in this report. These areas are:

12.1 EMERGENCY INCIDENT INFORMATION

First responders need **immediate** access to information on the products that are involved in an emergency incident. Railways should be required to provide product and shipper information to CANUTEC or local responders directly upon request without the significant delays that have been previously experienced (in particular for products shipped under a general UN classification, i.e. (UN 1267) - Petroleum Crude Oil. Train manifests are not sufficient for planning appropriate mitigation actions. This type of information is currently available from the trucking industry, because shipping documents with detailed information are carried with the driver.

The CANUTEC emergency centre is staffed by bilingual scientists specializing in chemistry or a related field and trained in emergency response. The emergency response advisors are experienced in interpreting technical information from various scientific sources including Material Safety Data Sheets (MSDS) in order to provide pertinent and timely advice. A product with an ERAP will allow first responders to contact the shipper for more detailed information such as a Material Safety Data Sheet (MSDS) for that specific product.

12.2 JOINT EMERGENCY PLANNING

12.2.1 Coordinated Planning

A standard emergency planning process for railway incidents is required to coordinate emergency planning that includes municipalities, railways, and the federal government and which identifies the roles and responsibilities of each.

12.2.2 Incident Command

The Incident Command structure and responsibilities / authority of agency representative's on-scene should be identified to facilitate development of an Incident Action Plan and ensure access to resources not available locally. (E.g. does the railway representative have authority to call-in specialized equipment)?

12.3 TRAINING OF FIRST RESPONDERS

Significant efforts must be made to increase the availability of training for first responders to dangerous goods incidents on railways. This training should be provided through development / coordination of programs such as Chemistry Industry Association of Canada *Transportation Community Awareness and Emergency Response (TransCAER®)* program, CN, CP and RAC Emergency Response courses, NFPA 472 – Hazmat training, and participation from industry such as the Canadian Association of Petroleum Producers (CAPP), etc. Transport Canada also needs to provide increased access and awareness training on the use

of the Emergency Response Guidebook (ERG), Emergency Response Assistance Plans (ERAP's) and the Canadian Transport Emergency Center (CANUTEC).

12.4 FIRST NATIONS CONCERNS

The representative of the *!b original Firefighters' Issoc iation of Canada* (AFAC) indicated that he appreciated being included in the WG and there is a need to ensure consideration and involvement of First Nations issues and concerns on the matters under discussion. He stated that First Nations firefighters face the same dangers and risks as other firefighters and the access to resources for dangerous goods incidents need to be available to them.

The ERAP WG Lead requested that the AFAC provide the ERAP WORKING GROUP with any suggestions or comments that they believe need to be included in future discussions or meetings. The AFAC has also been identified as a primary stakeholder and participant in the recommended ERAP WORKING GROUP on FLAMMABLE LIQUIDS.

The ERAP WORKING GROUP discussed these matters during the December 18th. Teleconference and also on January 24th and Jan 31st. in broad terms and it was agreed that these subjects are important to ensuring a successful outcome for dangerous goods incidents. These subjects are included as part of the recommendations.

13 CANADIAN TRANSPORT EMERGENCY CENTER (CANUTEC)

The Canadian Transport Emergency Center (CANUTEC) operated by the TDG Directorate provides 24/7/365, bilingual dangerous goods advisors and is the single point of contact for first responders, transportation companies and shippers of dangerous goods in the event of a spill. Established in 1979 it has become the first responders "9-1-1" for dangerous goods information, advice and access to additional resources through the ERAP program.

CANUTEC has developed comprehensive databases on thousands of dangerous goods and collected Material Safety Data Sheets (MSDS) to more accurately identify the properties and risks of specific products. The MSDS provides much more detailed information than the UN classification number and helps first responders to better protect themselves and the public while mitigating an incident.

The services provided by CANUTEC are absolutely critical to maintaining an effective Canada-wide dangerous goods response system. All members of the ERAP WORKING GROUP have indicated their support for the operation of CANUTEC and increased resources needed to ensure that CANUTEC is not degraded in any way. The ERAP WORKING GROUP strongly urges the Federal Government to invest in a more robust CANUTEC service. The additional work load required when new ERAP's are developed and the collection of data and providing information to municipalities and railways as required by Protective Direction 32 add an even more urgent requirement to provide the resources required in CANUTEC.

14 RECOMMENDATIONS

14.1 EMERGENCY RESPONSE ASSISTANCE PLANS (ERAP'S) FOR FLAMMABLE LIQUIDS

It is recommended that ERAPs be required for all Packing Group I and Packing Group II Class 3 Flammable Liquids in accordance with TDG Regulations Part 7.

Furthermore, it is recommended that Transport Canada conduct further study on the properties of different Class 3 Flammable Liquids to determine if ERAPs should be required for these products.

14.2 WHEN IS AN ERAP REQUIRED?

It is recommended that the volume of product shipped in a single (loaded) tank car as the standard for requiring an ERAP for Class 3 flammable liquids being transported by rail.

14.3 KNOWLEDGE OF AND ACTIVATING AN ERAP

It is recommended that improved awareness by first responders of the existence of an ERAP for a shipment of dangerous good be considered as an important component of the information sharing and be included in dangerous goods training programs.

It is recommended that ERAP regulations be revised to clarify who has the authority to activate an ERAP and that first responders be authorized to request CANUTEC to activate an ERAP if it is not done by the carrier in a timely manner.

14.4 CO-OPERATIVE APPROACH FOR A FLAMMABLE LIQUIDS ERAP PROGRAM

It is recommended that a co-operative approach be used for the Flammable Liquids ERAP that would permit new ERAP's to be developed with response capacity coming from or managed by a single entity as the most cost effective and efficient way to comply with the regulations. It is ultimately up to the shippers and the carriers to determine how this would be best accomplished.

14.5 REQUIREMENT FOR MORE INFORMATION AND DATA

The ERAP WORKING GROUP identified the lack of data as a serious constraint in providing detailed risk analysis and recommendations for addressing specific gaps in response capacities at any given community in Canada. It is recommended that data be collected on the following:

- Volumes, classifications and transportation corridors for dangerous goods as per Protective Direction 32
- Identify communities at risk along dangerous goods transportation corridors
- Identify existing flammable liquids firefighting resources by geographic area
- Identify gaps that exist and additional resources required.

Furthermore, it is recommended that Transport Canada introduce a permanent requirement for sharing dangerous goods information with municipalities before the expiry of Protective Direction No. 32 in November 2016. The introduction of a permanent regulation should reflect consultation with municipalities and railways on the implementation of Protective Direction No. 32.

14.6 ERAP WORKING GROUP ON FLAMMABLE LIQUIDS

It is recommended that an ERAP WORKING GROUP on FLAMMABLE LIQUIDS continue to work on all aspects that are required to implement a national flammable liquids emergency response capacity and that Transport Canada provide funding to support the work of those non-profit associations on this ERAP WORKING GROUP.

This WORKING GROUP could consist of the primary stakeholders including the following:

- Aboriginal Firefighters' Association of Canada
- Canadian Association of Fire Chiefs (CAFC)
- Canadian Association of Petroleum Producers (CAPP)
- Canadian Fuels Association (CFA)
- Federation of Canadian Municipalities (FCM)
- Railway Association of Canada (RAC)
- Other stakeholders to be determined such as Canadian Emergency Response Contractors Alliance (CERCA), Transport Canada, etc.

14.7 PROVIDE FUNDING FOR THE TDG ERAP PROGRAM

It is recommended that Transport Canada, Transportation of Dangerous Goods Directorate, be provided with sufficient resources to ensure the ERAP program can efficiently and effectively review, approve, inspect and monitor all ERAP programs.

14.8 CANADIAN TRANSPORT EMERGENCY CENTRE (CANUTEC)

The services provided by CANUTEC are absolutely critical to maintaining an effective Canada-wide dangerous goods response system. All members of the ERAP WORKING GROUP have indicated their support for the continued operation of and increased resources needed to ensure that CANUTEC continues to provide this critical service, The ERAP WORKING GROUP strongly urges the Federal Government to invest in a more robust CANUTEC service. The additional work load required when new ERAP's are developed and the collection of data and providing information to municipalities and railways as required by Protective Direction 32 add an even more urgent requirement to provide the resources required in CANUTEC.

14.9 COMMUNICATIONS AND INFORMATION SHARING

When an incident occurs the immediate availability of detailed information on the dangerous good(s) involved is critical to public and first responder safety. Product specific information beyond the general classification provided by the UN number is required. Shippers, carriers and CANUTEC must develop a system that will provide first responders with the necessary information and without delays that have occurred in some past incidents. A product with an ERAP will allow first responders to contact the shipper for more detailed information such as a Material Safety Data Sheet (MSDS) for that specific product.

14.10 STANDARD INCIDENT COMMAND SYSTEM

A standard Incident Command system that may include a Unified Command structure is required to avoid confusion, dangerous activities and ensure an appropriate Incident Action Plan is developed and agreed upon by all agencies. Agency representatives at an incident must have Incident Command training and understand their agency responsibilities, authority and limitations.

14.11 TRAINING PROGRAMS AND EXERCISES

To achieve the best possible outcomes and avoid confrontations and working at cross purposes it is necessary to have both senior agency representatives and supervisors participate in training programs to develop the knowledge and skills required to safely conduct their work. Training exercises involving municipal and other government agencies, railway personnel, private contractors and other parties that could be involved in a dangerous goods incident are an important component of the response plan. Build upon and support the TransCAER initiatives and other programs available to first responders.

15 TIMELINES

As previously indicated, the members of the ERAP WORKING GROUP recognize that there is an urgent need to identify and implement an effective response to the dangers presented by large spills of flammable liquids such as the highly volatile Bakken crude oil, gasoline, ethanol and other flammable liquids.

It is a significant challenge to build a national response network which would include acquiring the correct types and quantity of firefighting foam and foam equipment, identify locations where it would be staged and provide training to municipal fire services, railway personnel, emergency response contractors, and others.

The lack of information as identified in Section 11 TIME CONSTRAINTS AND THE REQUIREMENT FOR MORE INFORMATION AND DATA preclude the ERAP WORKING GROUP from providing recommendations on an implementation time frame. For those reasons it is recommended by an ERAP WORKING GROUP on FLAMMABLE LIQUIDS continue to work on all aspects that are required to implement a national flammable liquids emergency response capacity.

If the information and data required can be provided within a period of 2-3 months and initial agreement reached on how resources can be acquired and deployed, it may be possible to provide some implementation guidelines by the end of July, 2014.

This work would be carried out concurrently with the work of Transport Canada to prepare legislation for approval by the government, subject to the normal legislative process.

16 APPENDIX AND REFERENCE INFORMATION

16.1 FEDERATION OF CANADIAN MUNICIPALITIES (FCM) RAIL SAFETY POSITION

Equip and support municipal first responders to rail emergencies:

- Municipalities have a right to know what dangerous goods are being transported through their communities so local services can plan and respond effectively to emergencies.
- Railways and federal agencies cannot plan for emergencies alone. Local governments and authorities must be involved as partners in emergency planning.

Ensure federal and industry policies and regulations address the rail safety concerns of municipalities:

- Rail incidents can have significant local, community impacts on public safety, the economy and the environment.
- Municipal concerns must be included in federal government risk assessment and policy development on rail safety.

Prevent downloading of rail safety and emergency response costs to local taxpayers:

- Third party liability insurance systems must be strengthened to prevent the downloading of liability costs on taxpayers, even in the event of bankruptcies.

16.1.1 FCM Position on the benefits of using a TDG Part 7 ERAP vs. an Alternative

Comprehensive approach – The existing ERAP framework is systematic, predictable and more transparent than any industry-specific or more informal alternative. Through the CANUTEC link, the system provides precise information in a timely fashion, 24 hours a day. It allows for fully qualified assistance and adequate resources to be brought to bear on an incident.

Expeditious and relatively straightforward implementation – The fact that there is already a robust ERAP system in place is a key factor. The approval processes on the regulatory side are already established and, on the response side, there is already a nationwide network of private contractors who are equipped for a variety of hazards. Adding capacity to this system, regardless of the changes required to adapt to any new risks posed by hydrocarbons or other flammable liquids, is faster and simpler than creating an alternate system.

Economies of scale – Building on the ERAP framework to include hydrocarbons will allow all participants in the system to realize some economies of scale which would not be possible otherwise, helping to reduce any financial impact resulting from the inclusion of hydrocarbons and other flammable liquids in a comprehensive emergency response system.

Awareness within the municipal sector – Since any emergency response has to be undertaken in cooperation with local first responders, building on a framework which is already well-known in the

municipal sector is the logical approach to take. Most first responders have a good degree of familiarity with the ERAP framework and its role generally. Ways of further improving awareness of this tool are currently being considered but success will be more likely if efforts can be focused on a single, well-established system that includes all goods that are potentially dangerous to a community.

Training first responders – By including all flammable liquids under the ERAP regime, training programs offered to municipal first responders by the private sector, including by the contractors who provide assistance and equipment under existing ERAP plans, can readily be expanded to provide training relating to the new risks that would be covered by the expanded ERAP framework

16.2 CANADIAN ASSOCIATION OF FIRE CHIEFS (CAFC) - RAILWAY SAFETY / DG INCIDENTS

October 3, 2013

The following are concerns and recommendations from the CAFC with respect to planning, training and responding to dangerous goods incidents on railways.

1. Information Sharing (Right to Know)

(a) Information for Emergency Planning

Municipalities should have access through a central data base that allows them to identify the Dangerous Goods by class, volume and frequency that are being transported through their community on a monthly basis. This information is necessary to allow for appropriate emergency planning based on identified risks.

Apparently, Transport Canada does not at this time collect information of the classes, volume and frequency of dangerous goods being moved across Canada. This information would seem to be essential for the TDG Directorate to identify emerging or changing trends in dangerous goods shipments and to plan for ensuring safe transportation standards are being met. Legislation should be enacted to require this information be provided on a monthly basis to the TDG Directorate.

(b) Emergency Incident Information

First responders need **immediate** access to information on the products that are involved in an emergency incident. Railways should be required to provide product and shipper information to CANUTEC or local responders directly upon request without the significant delays that have been previously experienced. Train manifests are not sufficient for planning appropriate mitigation actions. This type of information is currently available from the trucking industry, because shipping documents with detailed information are carried with the driver.

2. Joint Emergency Planning

(a) Coordinated Planning

A standard emergency planning process for railway incidents is required to coordinate emergency planning that includes municipalities, railways, and the federal government and which identifies the roles and responsibilities of each.

(b) Incident Command

The Incident Command structure and responsibilities / authority of agency representative's on-scene should be identified to facilitate development of an Incident Action Plan and ensure access to resources not available locally. (E.g. does the railway representative have authority to call-in specialized equipment)?

3. Risk Assessment

(a) Railway Operating Practices

Railways should have a structured program to identify sites along their rail lines where hazard analysis should be conducted. Some factors that would be considered are traffic volume, urban settings, mountainous terrain, and dangerous good volumes. Operating practices in these high risk areas may have to be modified to help minimize accidents. The changes required by Transport Canada to railway operating practices following Lac Megantic such as not leaving trains with dangerous good unattended on main lines, locking access to locomotives, etc. is a first step.

4. Resources for Dangerous Goods Incidents.

Response to dangerous goods incidents require specialized equipment and supplies not available to most municipalities. Regional stockpiles of equipment, supplies and on-call specialist should be made available to any municipality within specified response times and at no cost to the municipality. Railways should develop and maintain this information and provide updated lists to municipalities annually.

Railways should cooperate in a "Mutual Aid" emergency support system to provide the closest and most appropriate resources. The Class I railways should also include "Short Line Railways" in this mutual aid system.

5. Training of First Responders

Significant efforts must be made to increase the availability of training for first responders to dangerous goods incidents on railways. This training should be provided through development / coordination of programs such as Chemistry Industry Association of Canada *Transportation Community Awareness and Emergency Response (TransCAER®) program*, CN, CP and RAC Emergency Response courses, NFPA 472 – Hazmat training, and participation from industry such as the Canadian Association of Petroleum Producers (CAPP), Canadian Propane Association etc. Transport Canada also needs to provide increased access and awareness training on the use of the Emergency Response Guidebook (ERG), Emergency Response Assistance Plans (ERAP's) and the Canadian Transport Emergency Center (CANUTEC).

16.3 CAPP AND CFA (PETROLEUM INDUSTRY) – TDG EMERGENCY RESPONSE COMMENTS

January 16, 2014

The Canadian Association of Petroleum Producers (CAPP) and the Canadian Fuels Association (referred to as the “Petroleum Industry”) as part of the Transportation of Dangerous Goods (TDG) Emergency Response Working Group (ER-ERAP WORKING GROUP), submits the following information for the recommendations on how to address the Minister’s request to advise Transport Canada on how emergency response could be enhanced.

The Petroleum Industry:

1. The Petroleum Industry does support emergency response plans for the transportation of dangerous goods. We do not support making all crude oil ‘ERAPable’, nor can we support making all flammable liquids ERAPable.

Rationale: Making all crude oil and/or all flammable liquids ERAPable does not use risk-based measures. To that end, it is important to note the role classification of products plays in a risk-based approach to Emergency Response. Therefore, the Petroleum Industry is of the view that the ERAP WORKING GROUP recommendations must be considered within the context of the work being completed by the Testing and Classification Working Group (T&C-ERAP WORKING GROUP). This group will be developing recommendations for improved product definitions and properties, along with sampling and testing (where, when and how) of products to ensure appropriate TDG classification. Accordingly, the T&C-ERAP WORKING GROUP recommendations will have ramifications for the appropriate labels, packing slips and Material Safety Data Sheets (MSDS) which will, in turn, have implications for initial response (e.g. Emergency Response Guidebook ERG) and the identification of hazards associated with the various crudes that are shipped into, across and out of Canada.

2. Work with the Rail Association of Canada (RAC) and the Canadian Association of Fire Chiefs (CAFC), as well as any other relevant stakeholder groups, to develop a preparedness organization structure to establish clear, effective and enduring response plans, and enable a coordinated all-hazards approach to response.

Rationale: An Emergency Response (ER) plan needs to understand how rail incidents may happen and how other products involved in an incident may react. Accordingly, it is critical that rail Carriers know the hazards of all goods that they transport so that they are prepared to provide emergency response (and arrange for required equipment) for incidents. The Petroleum Industry is of the view that the varying scenarios would be best determined by the rail Carrier, not the Shipper or Importer. To that end, the rail Carrier should have the best understanding of the potential consequences of an accidental release of dangerous goods. It is possible that rail Carrier emergency response plans could sufficiently and comprehensively capture any response requirements for an incident of dangerous goods on rail. This would enable an all-hazards approach through the streamlining of emergency response plans, and would reduce plan duplication. This is similar to the approach currently undertaken in the United States.

The above recommendations are based upon the following Principles:

- Safe transport of goods across Canada and the United States (harmonization across North America)
- Risk-based measures

- Carrier in best position for immediate ER response (care & control to manage risk)
- Responsible party pays
- Shipper in best position to provide information on product and subject matter experts

16.4 CANADIAN RENEWABLE FUELS ASSOCIATION - COMMENTS JANUARY 14, 2014



January 14, 2014

Chief Chris Powers
Canadian Association of Fire Chiefs
440 Laurier Avenue West, Suite 200
Ottawa, ON K1R 7X6

Dear Chief Powers,

On behalf of the members of the Canadian Renewable Fuels Association (CRFA) I am writing to you today to discuss the pressing issue of safety in the shipping of fuel.

Founded in 1984, the CRFA is the country's leading advocate for the economic and environmental benefits of clean-burning renewable fuels and represents the full spectrum of Canada's domestic biofuels industry. Our mission is to build on this success by developing and promoting a more innovative, sustainable and competitive business environment for Canada's emerging bioeconomy.

The ethanol industry in Canada is dedicated to maintaining the highest possible safety standards for the transportation of dangerous goods. We are in support of the undertakings of the Emergency Response Assistance Plan (ERAP) Working Group and are pleased to be members. The CRFA will continue to work closely with stakeholders, Transport Canada, and the Renewable Fuels Association in the United States to ensure that safety is a top priority.

In 2013, Canada produced 1.8 billion litres of ethanol, very little of which was shipped via rail. Canadian ethanol producers are primarily located close to blending terminals, negating the need for long distance transport. Domestically produced ethanol is almost exclusively shipped in small quantities by truck. Where rail transportation is used, the distance is typically short. CRFA ethanol producing members are required to ensure that placarding and UN designation labelling are correct. In Canada, the percentage of rail cars dedicated to the transportation of ethanol is a small fraction of the cars dedicated to other chemicals and crude. As such, the chance of incidents involving ethanol are far lower than with crude.

The greater risk is posed in the transportation of the over 1 billion liters of imported ethanol brought into Canada each year. The majority of this is transported by long line although a significant portion comes to Canada via rail.

I look forward to working with the Working Group further on this important issue. Do not hesitate to contact my office if I can be of any assistance.

Regards,



W. Scott Thurlow
President, Canadian Renewable Fuels Association

c.c. Peter Coyles, Special Advisor to the Director General, Transportation of Dangerous Goods, Transport Canada

www.greenfuels.org

605 - 350 rue Spence Street Ottawa, Ontario, Canada K1R 7S8 Tel/Tél. : (613) 594-5525 Fax/Ftéléc. : (613) 594-3076

16.5 RAILWAY ASSOCIATION OF CANADA – ERAP WORKING GROUP POSITION, JAN.24, 2014



GPAC ERAP Working Group

RAC Position:

The Railway Association of Canada (RAC) Dangerous Goods (DG) Committee has reviewed the subject of the potential for Petroleum Crude Oil (UN1267) in rail transport being considered an ERAP product under the Canadian Transportation of Dangerous Goods regulations Part 7.

Considering recent serious incidents involving Petroleum Crude Oil and the volumes being transported, the RAC DG Committee respectfully submits the following regulatory options for the working group consideration.

Option #1 – Any load of Petroleum Crude Oil (UN1267) must move under ERAP protection.

Or,

Option #2 – Any load of CLASS 3 products must move under ERAP protection.

The RAC DG Committee considers these options the most viable considering varied quantities of this product being shipped by rail.

The RAC, at this point, is not prepared to comment on the ERAP process as stated in Part 7 of the TDGR.

Please accept this proposal on behalf of the RAC Dangerous Goods Committee and the RAC membership.

Sincerely,

Jim Kozey, Canadian Pacific Railway
RAC Dangerous Goods Committee Chair.

CC – Jean Ouellette, CN, DG Committee Vice-Chair
Cc – RAC Dangerous Goods Committee
CC – Andy Ash, RAC
CC – Mike Lowenger, RAC
CC – Gerald Gauthier, RAC

16.6 TRANSPORTATION SAFETY BOARD NEWS RELEASE, SEPTEMBER 11, 2013

TSB calls on Canadian and U.S. regulators to ensure properties of dangerous goods are accurately determined and documented for safe transportation

Ottawa, Ontario, 11 September 2013 — The Transportation Safety Board of Canada (TSB) has issued safety advisory letters to Transport Canada and the United States Pipeline and Hazardous Materials Safety Administration with respect to its ongoing investigation into the Montreal, Maine & Atlantic Railway (MMA) train derailment in Lac-Mégantic, Québec, on 6 July 2013. The TSB is calling on the regulators to review the processes for suppliers and companies transporting or importing dangerous goods to ensure the properties of the goods are accurately determined and documented for safe transportation.

TSB test results indicate that the level of hazard posed by the petroleum crude oil transported in the tank cars on the accident train was not accurately documented. Petroleum crude oil is classified as a Class 3 Dangerous Good (flammable liquid), and is further divided into packing groups (PG) to further categorize its hazards (PG I being most hazardous, to PG III being least hazardous). In analysing product samples from the 9 intact tank cars from the Lac-Mégantic accident, the TSB identified the product as having the characteristics of a Dangerous Good of Class 3, **PG II** product. However, the product was offered for transport, packaged, and transported as a Class 3, **PG III** product, which represented it as a lower hazard, less volatile flammable liquid.

The lower flash point of the crude oil explains in part why it ignited so quickly once the Class 111 tank cars were breached. Since product characteristics are one of the factors when selecting a container, this also brings into question the adequacy of Class 111 tanks cars for use in transporting large quantities of low flash flammable liquids (PG I and PG II). The TSB investigation in this area is ongoing. Further tests are being done on the product samples and testing has started on the components of the tank cars. A review of the relevant regulations and company operating practices is also underway. These analyses will help determine the safety performance of the tank cars during the accident and to identify any related safety deficiencies

The Lac-Mégantic train derailment remains a priority for the TSB and a team of experts continues to be dedicated to this investigation. If at any stage during the investigation the TSB identifies additional safety deficiencies, it will communicate directly with regulators and the industry, and will inform the public.

16.7 CANADIAN TRANSPORTATION RESEARCH FORUM (CTRF) DOCUMENT JANUARY 13, 2014
(Excerpts only)

RAIL SAFETY IN TRANSPORTING DANGEROUS GOODS IN CANADA

What are the needs for changes to the regulatory framework?

By Malcolm Cairns

THE LAC-MÉGANTIC ACCIDENT

This accident has received wide coverage in the media and will only be summarized briefly here.

A unit train of crude oil from the Bakken shale formation was en route between New Town, North Dakota and Saint John, New Brunswick. The rail movement began on the Canadian Pacific (CP) railway and was passed off to the Montreal, Maine and Atlantic (MMA) shortline in Montreal for furtherance. The train was subsequently parked on the MMA mainline outside Lac- Mégantic, Quebec for the night by the sole engineer, and, under circumstances that are still under investigation by the TSB, early on July 6, 2013, the train consisting of five locomotives, one baggage car, and 72 tank cars – some or all of which were class DOT-111 – became a runaway train. The train descended the grade to the town of Lac-Mégantic, reached speeds in excess of 100 kilometres per hour, and all the cars derailed in the centre of town, 63 of the 72 tank cars were breached, some of the crude oil exploded, and 47 people were killed. This accident was the worst rail accident in North America in some 100 years, and the extraordinary extent of this tragedy can be seen when contrasted with figures above.

While there was some surprise expressed that crude oil exploded, the TSB has subsequently confirmed that the crude involved was mislabelled as a dangerous good Class 3 Flammable Liquid Packing Group III, instead of Packing Group II with a lower flash point². Combined with the enormous energy from the fast moving cars that needed to be dissipated upon derailment, this could be the reason for the explosions, but the definitive answer must await the TSB findings.

While the structure of the tank cars do not appear to be a factor in the cause of the runaway, the fact of their being breached will be of concern to the TSB. It should however be noted that some commentators have suggested that the speed of the cars at derailment make it unlikely that all the tank cars would have remained intact no matter what their class and design.

Government agencies in Canada and the US have already tightened rules. On July 23, 2013 Transport Canada announced an emergency directive under section 33 of the RSA, and in the US the Federal Railroad Administration issued an emergency order on August 3, 2013. These emergency orders relate to tightening operating rules to prevent runaways of trains handling dangerous goods. On October 17, 2013 Transport Canada also announced Protective Direction 31 under the Transportation of Dangerous Goods Act requiring any person who imports or offers for transport crude oil to conduct classification tests on crude oil. Until such testing is completed, when shipping by rail all such crude oil shall be identified as Class 3 Flammable Liquid Packing Group I – the designation with the lowest flash point.

The tank cars involved in the Lac-Mégantic accident were a type designated as DOT-111 that handle liquids – dangerous goods and non-dangerous goods – and are non-pressurized. At times during 2013, some 70% of the tank cars operating on the rail property of CP and CN were of the DOT-111 type.

Of the total 320,000 tank cars, excluding the pressurized tank cars leaves some 265,000 DOT-111 cars, of which some 160,000 handle dangerous goods. Of these 160,000:

- Some 30,000 handle crude oil, another 30,000 handle ethanol, and another 25,000 handle the remaining commodities classed as Flammable Liquids, such as gasoline;*
- The balance of 75,000 cars handle dangerous commodities in other classes;*

On September 6, 2013, the US Pipeline and Hazardous Materials Safety Administration (PHMSA) announced it is seeking public comment within 60 days on its Advance Notice of Proposed Rulemaking (ANPRM) that is intended to further enhance the safe transportation of hazardous materials by rail tank cars. One of the five proposed amendments would “impose additional requirements that would enhance the standards for DOT Specification 111 tank cars used to transport Packing Group (PG) I and II hazardous materials”. While this is a US initiative, it will have direct consequences in Canada through likely harmonization.

16.8 COMMENTS BY LIQUEFIED PETROLEUM GAS - EMERGENCY RESPONSE CORP

Dec. 18th, 2014

By Spencer Buckland - **Liquefied Petroleum Gas Emergency Response Corp**

For Consideration by the TDG Advisory ER Working Group.

Background: In the aftermath of the Lac-Mégantic rail disaster, the Minister of Transportation requested the TDG Advisory Committee to create an Emergency Response Working Group. The Emergency Response Working Group is to develop a report making recommendations regarding Emergency Response capabilities for Crude Oil and potentially ERAP for all TDG Class 3 liquids.

On behalf of the LPGERC, I would respectively ask the TDG advisory to consider the following principles going forward.

1. The scope and application of TDG ERAP needs to be clearly defined to include or not include Crude and/or all Class 3 Flammable Liquids.
2. If ERAP is applied to crude and/or all Class 3 flammable liquids then a new or existing not-for-profit Association could be created to help support the ERAP holders.
 - a. The new or existing Association would take on the role of administering a Quality Management System and applying it to Flammable Liquids Emergency Response Plan (ERP) as determined above.
 - b. The Association would be governed by a Board of Directors made up by industry stakeholders.
 - c. A Technical Advisory Committee would be struck to develop leading best practices and set guidelines and standards for flammable liquids incident response.
 - d. The Association would use the Incident Command System (ICS) structure as a basis for all policy, procedures, training and activation of the Emergency Response.
 - e. Class 3 Emergency Response Teams would not act as Incident Command but would be part of the Operations structure within the ICS.
 - f. ERP ERAP holders would pay a fee to the Association to ensure consistent, high quality teams and equipment caches are available in key strategic areas across Canada.
 - g. Response Teams and Remedial Measure Advisors (RMAs) would be required to sign service contracts to ensure the Response Team and the Association's roles and responsibilities are clear.
 - h. Response Teams and RMAs would be paid a retainer by the Association to ensure they are available when needed and to help offset the cost of Response Team training and equipment.
 - i. Response Teams would have to meet stringent training and competency requirements, team and equipment assessments as set by the

Association before being considered certified to respond to Crude or Class 3 ERAP products.

- j. Response Teams would be requiring recertification annually by means of annual training exercises and Association assessment.
- k. Response Team training , activation and equipment scope will need to be determined to include all or some of the following responses:
 - i. Spill recovery
 - ii. Transfer of product
 - iii. Environmental cleanup
 - iv. Class 3 flammable liquid firefighting capabilities.
- l. A 24/7 365 Call centre would be in place to act as the initial point of contact for activating ER for Crude or Class 3 Flammables.

In summary, if flammable liquids are to require an ERAP, a not-for-profit Association, which can coordinate and administer a system and network of teams across this country, will ensure a consistent and timely emergency response. A comprehensive project plan outlining the 5 W's (who, what, when, where and why) and the how needs to be developed with appropriate resources from industry experts, regulators, municipalities and first responders. This will take some time but will be worth the upfront investment so as to reduce the impact of future incidents in Canada.

16.9 TDG REGULATIONS PART 2 - CLASSIFICATION

Class 3, Flammable Liquids

2.18 General

(1) Substances that are liquids or liquids containing solids in solution or suspension are included in Class 3, Flammable Liquids, if they

- (a) have a flash point less than or equal to 60°C using the closed-cup test method referred to in Chapter 2.3 of the UN Recommendations; or
SOR/2008-34
- *A flash point of 65.6°C, using the open-cup test method referred to in Chapter 2.3 of the UN Recommendations, is equivalent to 60°C using the closed-cup test.*
SOR/2008-34
- (b) are intended or expected to be at a temperature that is greater than or equal to their flash point at any time while the substances are in transport.
- *The UN number and shipping name for the dangerous goods referred to in paragraph (b) are UN3256, ELEVATED TEMPERATURE LIQUID, FLAMMABLE, N.O.S.*

(2) Despite paragraph (1)(a), liquids that have a flash point greater than 35°C are not included in Class 3, Flammable Liquids, if they

- (a) do not sustain combustion, as determined in accordance with the sustained combustibility test referred to in section 2.3.1.3 of Chapter 2.3 of the UN Recommendations;
- (b) have a fire point greater than 100°C, as determined in accordance with ISO 2592; or
- (c) are water-miscible solutions with a water content greater than 90 per cent by mass.

2.19 Packing Groups

(1) Flammable liquids included in Class 3, Flammable Liquids, are included in one of the following packing groups:

- (a) Packing Group I, if they have an initial boiling point of 35°C or less at an absolute pressure of 101.3 kPa and any flash point;
- (b) Packing Group II, if they have an initial boiling point greater than 35°C at an absolute pressure of 101.3 kPa and a flash point less than 23°C; or
- (c) Packing Group III, if the criteria for inclusion in Packing Group I or II are not met.

(2) Despite subsection (1), for dangerous goods included in Class 3, Flammable Liquids,

- (a) when the packing group is unknown, the consignor may include the dangerous goods in Packing Group I; or
- (b) when the packing group is reasonably believed or is known to be Packing Group II or III, the consignor may include the dangerous goods in Packing Group II but, if the substance has the same characteristics as UN1203, GASOLINE, it may also be transported as Packing Group II.

(3) Despite paragraph (1)(b), a viscous substance that has an initial boiling point greater than 35°C at an absolute pressure of 101.3 kPa and a flash point less than 23°C may be included in Packing Group III if

- **(a)** the substance or any separated solvent does not meet the criteria for inclusion in Class 6.1 or Class 8;
- **(b)** the substance meets the Packing Group III criteria of the solvent separation test in section 32.5.1 of Part III of the Manual of Tests and Criteria; and
- **(c)** the substance
 - **(i)** has been tested in accordance with either ASTM D 1200 or ISO 2431, and
 - **(ii)** has a kinematic viscosity, measured as flow time, that is within the range shown in column 3 of the following table, using a jet with the diameter shown in column 2 for the corresponding flash point in column 1.

Table

Column 1	Column 2	Column 3
Flash point (FP) in °C (closed cup)	Jet diameter in mm	Flow time (t) in seconds
> 17	4	$20 < t \leq 60$
> 10	4	$60 < t \leq 100$
> 5	6	$20 < t \leq 32$
> -1	6	$32 < t \leq 44$
> -5	6	$44 < t \leq 100$
≤ -5	6	$100 < t$

16.10 STATISTICS CANADA TABLE 404-0021 RAIL TRANSPORTATION, ORIGIN AND DESTINATION OF COMMODITIES , ANNUAL (TONNES)
(2007 – 2011)

Table 404-0021 Rail transportation, origin and destination of commodities, annual (tonnes)(5)							
Survey or program details:							
Rail Commodity Origin and Destination Statistics - 2736							
Geography, origin of commodities	Geography, destination of commodities	Commodities and commodity groups	2007	2008	2009	2010	2011
Total tonnage from all origins	Total tonnage for all destinations	Gasoline and aviation turbine fuel	3,040,587	3,577,255	4,245,202	4,122,276	4,247,928
Total tonnage from all origins	Total tonnage for all destinations	Fuel oils and crude petroleum	5,434,288	5,293,739	5,126,558	5,246,516	5,501,838
Total tonnage from all origins	Atlantic Region, destination of commodities (1)	Gasoline and aviation turbine fuel	130,900	129,053	125,427	117,321	171,380
Total tonnage from all origins	Atlantic Region, destination of commodities (1)	Fuel oils and crude petroleum	296,882	329,841	346,578	317,133	313,201
Total tonnage from all origins	Quebec, destination of commodities	Gasoline and aviation turbine fuel	1,057,335	849,849	882,706	692,511	900,465
Total tonnage from all origins	Quebec, destination of commodities	Fuel oils and crude petroleum	994,269	1,205,373	1,149,735	1,234,333	1,021,349
Total tonnage from all origins	Ontario, destination of commodities	Gasoline and aviation turbine fuel	899,084	878,726	1,000,059	1,273,169	1,496,740
Total tonnage from all origins	Ontario, destination of commodities	Fuel oils and crude petroleum	1,280,465	1,151,164	1,069,024	968,926	1,252,349
Total tonnage from all origins	Manitoba, destination of commodities	Gasoline and aviation turbine fuel	40,177	105,636	88,224	70,099	65,640
Total tonnage from all origins	Manitoba, destination of commodities	Fuel oils and crude petroleum	115,346	176,003	122,301	92,754	108,050
Total tonnage from all origins	Saskatchewan, destination of commodities	Gasoline and aviation turbine fuel	61,232	51,418	56,231	49,780	27,456
Total tonnage from all origins	Saskatchewan, destination of commodities	Fuel oils and crude petroleum	495	51,912	41,204	12,240	5,734
Total tonnage from all origins	Alberta, destination of commodities (2)	Gasoline and aviation turbine fuel	718,474	1,465,140	1,970,612	1,803,183	1,367,254
Total tonnage from all origins	Alberta, destination of commodities (2)	Fuel oils and crude petroleum	525,063	539,653	363,969	420,578	573,960
Total tonnage from all origins	British Columbia, destination of commodities	Gasoline and aviation turbine fuel	124,103	85,979	105,206	102,046	184,845
Total tonnage from all origins	British Columbia, destination of commodities	Fuel oils and crude petroleum	1,460,437	1,184,935	1,272,232	1,322,296	1,311,820
Total tonnage from all origins	United States and Mexico, destination of commodities	Gasoline and aviation turbine fuel	9,282	11,454	16,737	14,167	34,148
Total tonnage from all origins	United States and Mexico, destination of commodities	Fuel oils and crude petroleum	761,331	654,859	761,515	878,256	915,375
Footnotes:							
	5	Financial, operational and origin and destination data may change on a year to year basis as a result of fluctuations in currency exchange rates, reclassifications of accounts, etcetera. Data are also influenced by mergers, acquisitions and companies which may enter or exit the industry.					
	1	Atlantic Region includes: Newfoundland and Labrador, Nova Scotia, New Brunswick and Prince Edward Island.					
	2	Alberta includes Northwest Territories.					
Source:							
Statistics Canada. Table 404-0021 - Rail transportation, origin and destination of commodities, annual (tonnes) (accessed: January 18, 2014)							