Meeting Summary

Competencies for Responders to Incidents of Flammable Liquids in Transport –
Developing a Codes and Standards Roadmap

Held jointly with Transport Canada Emergency Response Task Force

March 18, 2015
Transport Canada Headquarters
Ottawa, Ontario
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Meeting Summary

Competencies for Responders to Incidents of Flammable Liquids in Transport –
*Developing a Codes and Standards Roadmap*

March 18, 2015
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Ottawa, Ontario

**Background and Meeting Objectives**

On March 18th, 2015, 28 members of the Transport Canada Emergency Response Task Force met with representatives of the National Fire Protection Association (NFPA) to develop a specific action plan towards standards development and other actions to address emergency responder competencies for flammable liquids incidents in transport. The meeting was held under the auspices of the Fire Protection Research Foundation, NFPA’s research affiliate. Those in attendance are listed in Appendix A.

Kathleen Almand, Vice President Research, expressed NFPA’s appreciation for the invitation to facilitate this meeting; this issue is an emerging North American problem and NFPA welcomes the opportunity to work with the Task Force to address it.

Chief Chris Powers, Chair of the Task Force, expressed his support for an NFPA standards approach to develop a common benchmark for emergency responder competencies and referenced the new project proposal he had submitted on behalf of the task force.

Kathleen laid out the specific goals for the meeting:

1. To gain consensus endorsement on the need for NFPA standards to address job performance requirements for the emergency response community for incidents of flammable liquids in transport
2. To gain consensus endorsement on the need for an interim guidance document on this subject and to identify possible routes to accomplish this task.
3. To review and discuss the content of this standard/guidance, (using the New Project Initiation Form prepared by Chief Powers as a strawman, identifying possible gaps and considering the Training Subgroup Issue Paper and the Flammable Liquids Technical Advisor (FLTA) Competency Profile documents prepared by the task force as additional inputs and consideration.
4. To identify specific next steps to accomplish goals 1 and 2.
Stakeholder Perspectives

Five major stakeholders shared their perspective:

Jim Kozey, CP Rail presented the rail industry perspective and made the following key points:

- Crude oil represents a unique hazard (a non-homogeneous flammable liquid) - the characteristics and physical properties of different flammable liquids are important in response
- Tank car design is important to response tactics (e.g. Jacketed vs. non-jacketed tank cars); heat induced "tears" (an upward heat release through a failure in the vapour space of a tank car involved in a pool fire) have been observed in flammable liquid rail incidents and are different from a BLEVE; the careful application and potential unsuitability of water as a suppression agent; etc.
- Current standards (e.g. response, foam) do not address the unique aspects of a rail incident involving flammable liquids; for example it is critical to initially cool rail cars before extinguishment when foam is a limited resource; cooling tactics are different depending on tank car design and how those cars come to rest in an accident scenario.
- Awareness level training for members of the fire service where rail service exists is needed to reduce risk to the emergency responder, in addition to other higher levels of training: i.e. varying levels of competency
- The rail industry supports an NFPA standards solution, whether NFPA 472 revisions or a new standard, and will support with technical participation from the industry
- These standards should be useful/applicable to both private and public sector responders

Blake Williams, representative for Canadian Association of Petroleum Producers, presented the petroleum industry perspective:

- NFPA is the right source for competency standards for this topic and most information already resides in NFPA 472, 11, 2011 and others
- The industry supports the need for education and outreach for first responders, response contractors and industry responders through such means as TRANSCAER events.
- The industry supports the need for awareness training for the fire service. NFPA standards should be referenced in, provide the basis for, this training
- The industry will support the development of NFPA standards with their technical expertise and is willing to share the standards they have for their own contractors who respond at their sites
- Competency standards should acknowledge the limitations of a responder’s knowledge
- A key value in competency standards is a common understanding of the qualifications of those who respond
- There must be varying levels of competency to address awareness and higher levels.

Brian Ladds presented the perspective of the Canadian Association of Fire Chiefs:

- NFPA standards have the broad credibility and exposure and are seen as the go-to resource for the fire service in Canada
- It is important to consider the range in the size of municipalities who may engage in a flammable liquids rail incident and their associated capabilities; also structural fire fighters may be involved in flammable liquids incidents for which they have no basic training
- CAFC believes it is essential that a training program for the fire service be developed based on the competencies laid out in NFPA standards
- CAFC believes that one go-to source- either one standard, one part of one standard or one document with close links to other resources is essential
There are two components to the need; one is to bring all information to one place; the second is to fill some of the technical gaps associated with these unique crude oil rail incidents.

Eve Poirier presented Transport Canada and the Emergency Response Assistance Program’s (ERAP) perspective:

- A gap in the ERAP program currently is firefighting response – to ensure that appropriate equipment is used in the incident and that emergency response personnel is trained and qualified.
- The credibility of NFPA is broadly acknowledged and the ERAP program would like to reference NFPA standards if they are available; thus ERAP endorses the development of NFPA standards for this purpose and believes that different competency levels should be assigned to an FLTA and the municipal first responder.

Denis Lauzon presented his perspective as an incident commander in a small municipality:

- The incident commander must have a source of recognized credentials for those he/she turns to in an incident for advice so that that advice can be relied upon
- NFPA standards for competency are recognized and can create a common level of understanding for all involved

NFPA Resources

Kenneth Willette, Public Fire Protection Division Manager, NFPA, presented an overview of the NFPA codes and standards relevant to the meeting objective and the timetables associated with each. (See presentation – Appendix B). He noted:

- The proposal for a new standard development project submitted by Chief Powers will be considered by the NFPA Standards Council at its April 7th meeting. The proposal may be sent to an existing technical committee for incorporation in existing standards or may go out for public comment to solicit input from all stakeholders on the need for a new standard. If that response is positive then the Council may initiate standards development; a typical timeframe for issuance is three years.
- NFPA has two mechanisms for emergency changes to standards: the Tentative Interim Amendment which is used for narrow scope changes to existing standards identified as being of an emergency nature, and an expedited new standards development process, used for the first time recently, as a result of a recommendation from the U.S. Chemical Safety Board in response to a gas explosion incident which identified a gap in U.S. standards. Requests for these actions are reviewed by the Standards Council.
- The Fire Protection Research Foundation, NFPA’s research affiliate, conducts research projects in support of NFPA’s mission, often to inform codes and standards development. This mechanism, which is not a standards development process, is available to collect relevant information on a topic and assemble best practices. All Foundation projects are overseen by an advisory panel of stakeholders and all reports are publicly available on its website.
Discussion of Needs

Meeting participants were divided into groups and discussed the following issues:

- What is the scope of standards development desired?
- What stakeholders would utilize the standard?
- Is NFPA the appropriate organization to develop this standard?
- Is interim guidance desired in the absence of standards?
- What other actions are needed to respond to the need to build competency for responders to flammable liquids transport incidents?

The detailed results of group discussions are included in Appendix C.

Summary Discussion and Recommendations:

Each group facilitator presented a summary of their discussion and the group as a whole was in agreement with the following:

There is a need for National Fire Protection Association Standards to address job performance requirements/competencies for the emergency response community for incidents of flammable liquids in rail transport. Although several NFPA standards cover the majority of needed requirements, a single source for requirements and guidance is needed.

Emergency responders in this context include technical advisors, technical specialists, carriers, governmental and jurisdictional personnel in product control (including fire suppression). There are differing levels of required competencies for different roles.

There are technical gaps in existing standards, including unique competencies associated with rail car (3D, non-fixed) incidents. A research project which brings together existing guidance, incident experience, and relevant technical information would be of value. There is a large group of stakeholders with available information and/or commitment to develop this information.

There is a need for an interim guidance document on this subject and possible pathways at NFPA to achieve it.

There is a broad based need for awareness level training for the fire service in communities on rail routes; more in depth training for specialists; training facilities; certification programs; and equipment.

Action Items/Next Steps

The Task Force will consider:

- A possible public comment in the current revision cycle of NFPA 472. NFPA staff are available to assist.
- The need for/means to conduct a research project to gather available information to inform standards/guidance.
- A path to develop needed interim guidance
Appendix A  Attendance

Jim Bird  Univar, Canadian Association of Chemical Distributors
Angelo Boccanfuso  CANUTEC - Transport Canada
Giulia Brutesco  Canadian Fertilizer Institute
Spencer Buckland  Emergency Response Assistance Canada
Scott Croome  CP Rail
Denis Foisy  CANUTEC – Transport Canada
Dennis Gannon  Ontario Office of the Fire Marshal and Emergency Management
Peter Grootendorst  Justice Institute of BC
Brian Ladd  Canadian Association of Fire Chiefs
Louis Laferriere  Vice Chair, ERTF, Transport Canada
Benoit Laroche  Ecole Nationale des Pompiers Quebec (ENPQ)
Denis Lauzon  Lac Megantic Fire Department
Melanie Lavac  Canadian Propane Association
Clive Law  Transport Canada
Mathieu LeMay  Transport Canada
Ronald Lutzer  Agrium – Canadian Fertilizer Institute
Jim Kozey  CP Rail
David Matschke  DRDC- Center for Security Science
Craig McCaskey  Canadian Association of Petroleum Producers (CAPP)
Adrian Michielsen  Imperial Oil, Canadian Fuels Association
Curtis Myson  Railway Association of Canada
Chris Powers  Chair, ERTF, Transport Canada
Eve Poirier  Transport Canada
Dennis Redford  B.C. Ministry of Environment
Corey Schram  Canadian Association of Fire Chiefs
Danny Simpson  CN Railway
John Tomaselli  Transport Canada
Blake Williams  CAPP – Husky Energy

Kathleen Almand  NFPA, Fire Protection Research Foundation
Tom McGowan  NFPA
Shayne Mintz  NFPA
Kenneth Willette  NFPA
FPRF: Role of the Foundation

- Plan, manage and communicate research in support of the NFPA mission
- Independent charitable organization
  - Formed by NFPA in 1982
  - Intended to provide data to support the needs of NFPA codes & standards
  - Research funds come primarily from:
    - Private and public sector consortia
    - Grants and government sources (e.g. DHS S&T, DOD, DOE, DOT, FEMA AFG, NIOSH, NIST, NSF, etc)
    - Multiple other sources (including NFPA)
FPRF: How the Foundation Operates

I. Agenda Setting – research planning in emerging areas

II. Research Programs –
   • Research projects to meet the needs of NFPA Committees and others
   • Projects range from small literature search type studies to major fire testing programs

III. Benchmarking – state of the art symposia
Understanding the Foundation

FPRF: Project Participants… Who are they?

- **Funding (Sponsors):** *Where does it come from?*
  - Manufacturers, trade associations, NFPA, federal agencies, research organizations, nowhere, etc…

- **Contractors:** *Who Does the Work?*
  - Consultants, research organizations, test labs, universities, NFPA Fire Analysis, volunteers

- **Advisory Oversight:** *Project Technical Panel*
  - Typically small (6 to 15)
  - Meet at important stages of project (start/end/other)
FPRF: Research Process (for “Advisory Service” Proj)

1) Project Technical Panels:
   • Code enforcers, code writers, subject matter experts, principal sponsors, NFPA staff liaisons
   • Determines technical details of the project, oversees and provides guidance to contractor

2) Research Performed:
   • Contractor conducts the project
   • Other organization obtains funding & leads project w/ FPRF support

3) Research Reports Published:
   • Final reports published and made available to all
FPRF: Project Characteristics and Ideas

– Characteristics of Foundation Projects:
  (collaboration, cost sharing, independence, pipeline to implementation, communications network)

– Project Ideas:
  • TC struggling with an issue, via staff liaison
  • Industry wants to introduce new technology into standard; needs data
  • Two opposing views on an issue and data needed
  • Data presented is not trusted by committee
  • Emerging technical issue – e.g. alternative energy
  • TC establishes ongoing research planning activity

www.NFPA.org/Foundation
New Project Request

Submitted & April 7 SC Agenda

• Review at meeting
• Action
  – Hold
  – Public Comment
  – Assign

NEW PROJECTS & DOCUMENTS

The NFPA Standards Council considered and reviewed the following new projects and new committees and is seeking public review and comment by the February 1, 2015 deadline:

• Fire-based community healthcare provider (FBCHP) program
• Selection, care, and maintenance (SCAM) of rescue tools
• Selection, care, and maintenance of tactical operations video equipment
• New committee on facilities for fire training and associated props
SC Action

• Hold
  – Not enough information
  – Fuzzy scope
  – Negative recommendation

• Public Comment
  – NFPA News
  – Direct request
  – Assign or appoint

• No Action
  – Self explanatory
1.1 Scope. 1.1.1* This standard shall identify the minimum levels of competence required by responders to emergencies involving hazardous materials/weapons of mass destruction (WMD). 1.1.2 This standard shall apply to any individual or member of any organization who responds to hazardous materials/WMD incidents. 1.1.3 This standard shall cover the competencies for awareness level personnel, operations level responders, hazardous materials technicians, incident commanders, hazardous materials officers, hazardous materials safety officers, and other specialist employees. A.1.1.1 Outside the United States, hazardous materials might be called dangerous goods (see Annex H). Weapons of mass destruction (WMD) are known by many different abbreviations and acronyms, including CBRNE (chemical, biological, radiological, nuclear, explosive), B-NICE (biological, nuclear, incendiary, chemical, explosive), COBRA (chemical, ordinance, biological, radiological agents), and NBC (nuclear, biological, chemical).
TC

• Assigned
  – TC Reviews
  – Considers best way to incorporate
  – Follows normal development cycle
  – Task group

• Appointed
  – Start up TC
  – TC membership
  – Draft document
  – Enters revision
  – First edition

NEW DRAFT DOCUMENTS
The preliminary draft of a proposed new NFPA Standard is made available to allow the public to view the drafts and submit public input. These preliminary drafts are works in progress and as such have no official status. They are available solely for use in submitting public input and are not intended for any other use.

Public input sought on the following preliminary drafts:
  • NFPA 1616: Standard for Mass Evacuation and Sheltering, public input closing date: 1/5/2015
Four Steps

- The 4 Steps of Developing NFPA Standards
- Public Input (July 6, 2015)
- Public Comments (May 5, 2016)
- Annual Association Technical Meeting
- Standards Council Appeals and Issuance of Standard
The Standards Development Process

**STEP 1** Input Stage
- Last Edition Published
- Ballot Second Draft
- Second Draft Report Posted
- No Public Comments Received
- No Second Revisions by Committee
- No NITMAM Received or NITMAM not Certified
- NITMAM Closing Date

**STEP 2** Comment Stage
- First Draft Report Posted
- First Draft Meeting
- Comment Closing Date
- Consent Standard
- NITMAM Received and Certified

**STEP 3** Association Technical Meeting
- Consent Standard
- NITMAM Received and Certified
- NITMAM Closing Date

**STEP 4** Council Appeals and Issuance of Standard
- First Draft
- Ballot Second Draft
- Second Draft Report
- No Public Comments Received
- No Second Revisions by Committee
- No NITMAM Received or NITMAM not Certified
- NITMAM Closing Date

**Comment Stage**
- First Draft Report Posted
- First Draft Meeting
- Comment Closing Date
- Consent Standard
- NITMAM Received and Certified
- NITMAM Closing Date

**Council Appeals and Issuance of Standard**
- First Draft
- Ballot Second Draft
- Second Draft Report
- No Public Comments Received
- No Second Revisions by Committee
- No NITMAM Received or NITMAM not Certified
- NITMAM Closing Date
TIA

- Specific change to specific document
- Typically limited in scope
- Needs TC support
  - Emergency nature
  - Technical
- Exists only until next revision
- Becomes Public Input
Thank You!

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Group 1

NFPA Facilitator: Tom McGowan

Scope and Audience for Needed Standard

This standard and other relevant NFPA standards identifies the minimum competencies for training emergency responders, technical advisors, technical specialists, carriers, governmental and jurisdictional personnel in product control (including fire suppression) at flammable/combustible liquids rail transport incidents.

Other Stakeholders: Municipalities and other governments and by-laws and regulations; CSA – Z1600; American Association of Railroads/ Railway Association of Canada; American Petroleum Institute/Canadian Association of Petroleum Producers; International Association of Emergency Managers

Gaps in NFPA documents

- NFPA 11: limited to facility vs. transportation (possible research foundation proposal)
- NFPA 1001: limited in scope to structural/municipal firefighting
- NFPA 1081: limited in scope to fixed facility; advantage – extract material available; different levels of competency when looking at various levels to consider
- NFPA 472: container behavior under fire conditions; not specific to various flammable liquids (i.e. crude)
- NFPA 600: advantage – competencies back to NFPA 1081
- NFPA 1600: advantage as additional reference
- NFPA 1561: advantage as additional reference
- NFPA 1026: advantage as additional reference

Non-NFPA gaps

- Product characteristics – spectrum
- Capabilities of fire fighters and fire brigade personnel at these types of incidents
- Product control understanding
- Roles of leadership from a management of the incident and governing perspective not necessarily operations perspective
- Training at all levels (consist curriculum and supporting materials)

Needs beyond NFPA

- Training facilities
- Certified Instructors
- Time frame (emergency nature vs. 104 weeks)
- Tactical/strategic considerations and training for these types of specific incidents
- Equipment
- Enhancement/investment of confidence to community
Action Items

- Establish a consist training program for flammable liquids rail incidents for various competency levels
- Explore other NFPA opportunities

Group 2

NFPA Facilitator Kenneth Willette

Scope: Need for a single document that:

- Identifies competencies and capabilities for industry carriers, government and first responders to safely and effectively mitigate incidents involving flammable liquids transport

Stakeholders: first responders, FLTA, government at multi levels, emergency responder contractor/ERAP holder; railroads/carriers; transporter; shipper; contractors; first nations; environment ministry; industry associations; fire marshals/comm.; training providers; industry

Gaps

What should ERAP cover?: Training levels; environmental tactics and strategy; social impacts; safety of responders and the public; competencies/capabilities/capacity; equipment; resources; water supply; properties/behaviors; gas detection/monitoring; terminology; response; areas of containment

- Risk assessment/shared understanding or common approach to pre incident planning
- Formal accreditation is missing during the interim
- Who will do the training
- Transitional period concerns
- Terminology standardized
- Thermal tear – experiential knowledge and lessons learned, central databank
- What to do about the opt-outs?
- Research – US and CA experience with incident response – data collection and analysis
- Re-certification?
- How to benchmark effectiveness of measures
- How do we know what we don’t know?
- Interoperability of communications equipment – lack

Group 3

NFPA Facilitator Shayne Mintz

Scope: Competency Standards and Guidelines

A compiled set of requirements cherry picked from various NFPA documents and other sources of technical guidance for competencies for response to flammable liquids incidents in rail transport. Possible NFPA standards that are relevant – 1001; 472; 1081. The technical core can be covered in NFPA
perhaps with a ‘spoke’ to a new tank car firefighting specialty – i.e. mission specific ops/tech competency

**Audience for Needed Standard**

Both industry and municipal first responders are the audience but there must be defined competency levels – awareness, operations, technician levels or a more simplified two level approach – e.g. FLTA and first responder

**Stakeholder organizations that have subject matter expertise**

- International Association of Fire Chiefs (IAFC)
- Canadian Association of Fire Chiefs (CAFC) and potentially (provincial Fire Chiefs Associations)
- American Association of Railroads (AAR)
- Railway Association of Canada (RAC)
- American Petroleum Institute (API)
- Railway Supply Institute (RSI)
- Canadian Association of Petroleum Producers (CAPP)
- Canadian Association of Chemical Producers (CACP)
- Transport Canada/Department of Transport (TC/DOT)
- Renewable Fuels Association (RFA),
- Pipelines and Hazardous Materials Safety Administration (PHMSA)
- North American Training Directors (NATD)
- International Society of Fire Services Instructors (ISFSI)
- International Fire Service Accreditation Congress (IFSAC)
- Pro Board Fire Service Professional Qualifications System (Pro Board)

**Gaps**

- Additional JPRs are needed to operate in a train derailment environment – for example – proper cooling techniques of train cars, being aware of dangers of interaction of water and combustible fuel products to avoid overtopping, foam applications, 3Dimensional fire extinguishment techniques

**Training**

Priority – vital awareness level training to the fire service as soon as possible for communities that have exposure to railways; a Hazard Identification and Risk Assessment (HIRA) process should be used to determine need and priority of receiving training

Mechanisms: adaption of AAR and API information in a self-teaching format; regional training centers; hands on training needed for advanced levels; e.g. 3 day Pueblo style course; enhanced training facilities needed
Competencies for Responders to Incidents of Flammable Liquids in Transport
– Developing a Codes and Standards Roadmap
March 18, 2015
9:00 a.m. - 4:00 p.m.
Transport Canada
330 Sparks Street, Place de Ville Tower C,
Ottawa, Ontario
Boardrooms FC 27-28-29-30 (food court level – basement level)

Agenda

1. Introductions, Meeting Objective  Kathleen Almand
3. Potential Pathways for Standards/Guidance Development  Kathleen Almand

10:30 Break

4. NFPA Resources and Current Initiatives  Kenneth Willette
5. Interactive Discussion on Scope  All

12:30 – 1:30 Lunch

6. Interactive Discussion on Gaps, Needs  All
7. Summaries of Interactive Discussion  Moderators
8. Review Findings; Identify Action Items  Kathleen Almand

9. Adjourn
a. Explain the Scope of the new project/document:

**Proposed Standard on Competencies for Responders to Incidents of Flammable Liquids in Transport – High Hazard Flammable Trains (HHFT)**

The document should specify the factors to be considered and competencies required when responding to railway incidents (derailments) involving multiple tank cars of flammable liquids (HHFT) including crude oil, ethanol and other Class 3 products.

This standard could include: - knowledge of physical and chemical properties of the product(s), type, condition and behavior of tank cars, railway safety for first responders, stability of the incident, risk factors – fire spread, explosion, toxic gases, resources needed and available from both government and private sector, intervention or non – intervention strategies, environmental factors and impacts, downstream potential for fire spread / contamination from flowing product, damming or diking possibilities, evacuation considerations, foam types, volumes required, large capacity foam equipment operation, application techniques, containment and securement of unburned product. A section on pre-planning and exercises with first responders, railroads, shippers and other resources (CANUTEC, CHEMTREC, etc.) should also be included.

Because of the scale and complexity of these incidents there is a need to develop a single reference standard that includes all these factors and more and then defines the knowledge, skills and training required by technical advisors from industry, public first responders including incident command staff and firefighters, federal government specialists (Remedial Measures Specialists) etc. to be qualified to safely mitigate these large scale incidents involving flammable liquids in transport.

*NOTE: PHMSA is proposing to add a new definition to 49 CFR 171.8 defining ‘high-hazard flammable train’ (HHFT) as “a single train carrying 20 or more carloads of a Class 3 flammable liquid”.*

b. Provide an explanation and any evidence of the need for the new project/document:

On July 6th, 2013 a 73-car Montreal, Maine & Atlantic train carrying Bakken crude oil from North Dakota rolled away from where it had been parked and derailed in downtown Lac-Mégantic. The equipment that derailed included 63 of the 72 tank cars. 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. Firefighting foam was brought from Valero 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. Over 5,000,000 liters of crude oil spilled and either burned, ran into the lake and river or contaminated large areas of the ground in the vicinity.

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.

Following the Lac Megantic incident additional incidents involving derailments of High Hazard Flammable Trains (HHFT) occurred including:

- November 8th, 2013 - Pickens County Alabama
- December 30th, 2013 near Casselton, N.D
- January 7th, 2014 near Plaster Rock N.B.
- April 30th, 2014 Lynchburg Va.

From the Transportation Safety Board of Canada the following comments:

*In recent years, the transportation of crude oil by rail has increased dramatically in North America such that the amount of crude oil that is now being shipped by rail is staggering. In Canada, shipments of crude oil by rail have increased from a mere 500 car loads in 2009 to 160,000 car loads in 2013. In the United States, crude oil shipments have increased from 10,800 car loads in 2009 to about 400,000 in 2013.*
According to the Rail Energy Transportation Advisory Committee and data from the North American Freight Car Market, longer-term projections for crude oil and its shipment by rail include:

- The United States could produce as much as 11.6 million barrels per day (b/d) of crude by 2022.
- The Canadian production is expected to reach as much as 5.6 million b/d of crude by 2025.
- In North America, roughly 1.0 million b/d of crude is currently moved by rail and the total volume of crude transported by rail is expected to grow to 4.5 million b/d in the next 10 years.

Given this significant projected growth, the TSB is concerned that infrastructure and operating conditions may not ensure a safe rail system now and in the future. With the introduction of unit trains, which can consist of 80 tank cars or more carrying large volumes of liquid hydrocarbons over long distances and through urban areas, the risks to the public and the environment along the train’s route have increased significantly.

April 23, 2014, the Hon. Lisa Raitt, Minister of Transport, announced the establishment of the Transportation of Dangerous Goods - Emergency Response Task Force to conduct further research, assess, evaluate and make recommendations to advance and make improvements to the Emergency Response Assistance Plan (ERAP) program to enhance emergency response and public safety.

In developing improved emergency response to train derailments involving large quantiles of flammable liquids, members of the Transport Canada, Emergency Response Task Force identified the lack of a single, comprehensive standard to reference that provides both industry and municipal response personnel with the information needed to identify the knowledge, skills and training required to safely and effectively mitigate these incidents.

c. Identify intended users of the new project/document:


d. Identify individuals, groups and organizations that should review and provide input on the need for the proposed new project/document; and provide contact information for these groups:

Municipal and First Nations fire services. Provincial / State Fire Marshals or Fire Commissioners, Railway emergency response personnel, petroleum / ethanol / chemical industry response personnel, emergency response contractors, municipal, state, provincial and federal Emergency Management agencies, Federal government regulatory agencies, (Transport Canada, U.S. DOT, PHMSA), State, Provincial and Federal Environmental Ministries / Departments, Fire Training organizations including Fire Colleges / Academies / Schools both government and private.

e. Identify individuals, groups and organizations that will be or could be affected, either directly or indirectly, by the proposed new project/document, and what benefit they will receive by having this new document available:

Municipal and First Nations fire services. Provincial / State Fire Marshals or Fire Commissioners, Railway emergency response personnel, petroleum / ethanol / chemical industry response personnel, emergency response contractors, municipal, state, provincial and federal Emergency Management agencies, Federal government regulatory agencies, (Transport Canada, U.S. DOT, PHMSA), State, Provincial and Federal Environmental Ministries / Departments, Fire Training organizations including Fire Colleges / Academies / Schools both government and private.

f. Identify other related documents and projects on the subject both within NFPA and external to NFPA:

- NFPA 11 – Standard for Low-, Medium and High-Expansion Foam
- NFPA 472 – Competencies for Responders to Hazardous Materials / Weapons of Mass Destruction Incidents
- NFPA – 1001 - Firefighter Professional Qualifications
• NFPA – 1081 - Industrial Fire Brigade Member Professional Qualifications


• Transportation Safety Board of Canada – Rail Safety Recommendations, 23 January 2014 to Hon. Lisa Raitt, Minister of Transport, Transport Canada and Ms. Cynthia L. Quartersman, Administrator, Pipeline and Hazardous Materials Safety Administration (U.S.)

• NTSB Safety Recommendation R-14-005 - TO THE PIPELINE AND HAZARDOUS MATERIALS SAFETY ADMINISTRATION: Revise the spill response planning thresholds contained in Title 49 Code of Federal Regulations Part 130 to require comprehensive response plans to effectively provide for the carriers’ ability to respond to worst-case discharges resulting from accidents involving unit trains or blocks of tank cars transporting oil and petroleum products.


• Transport Canada, Protective Direction 33 – ERAP requirements for specified Class 3 Flammable Liquids (now a regulation under Canada Gazette Vol. 148, No. 27 — December 31, 2014 SOR/2014-306 December 12, 2014 TRANSPORTATION OF DANGEROUS GOODS ACT, 1992 - Regulations Amending the Transportation of Dangerous Goods Regulations (Lithium Metal Batteries, ERAPs and Updates to Schedules)


• “Flammable Liquids (TDG) Emergency Response Chart (A Disciplined Approach) and Guide” Canadian Fuels Association and Chemistry Industry Association of Canada


• Many other documents, news reports and media coverage of this issue are available from the NFPA Charles S. Morgan Technical Library

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g. Identify the technical expertise and interest necessary to develop the project/document, and if the committee membership currently contains this expertise and interest:

The Transport Canada, Emergency Response Task Force membership includes individuals with the technical expertise or they have access to that expertise within their sector/organization. Additional participation from other organizations could be facilitated as required.

See attached membership list for the Emergency Response Task Force.

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h. Provide an estimate on the amount of time needed to develop the new project/document:

Using existing information/standards/expertise from the petroleum/ethanol/chemical industries, railroads, fire service and environmental sectors working on a dedicated task force it is estimated that 8 – 10 months could result in a draft document being completed.
Comment on the availability of data and other information that exists or would be needed to substantiate the technical requirements and other provisions of the proposed new project/document:

- Current NFPA Standards including 11, 472, 1001, 1081 have various sections related to the information/data required.
- Transport Canada, PHMSA, TSB Canada, NTSB and others are currently collecting data, conducting testing of crude oils, and investigating various aspects of these incidents.
- Data on transportation of crude oil, ethanol and other flammable liquids by rail will assist in establishing communities at risk.
- Location of resources (foam, equipment, railway resources, etc.) are being identified and will be mapped using GIS.
- Petroleum industry has data and information on both crude oil types and refined product including Safety Data Sheets,
- Renewable Fuels Association has data and information for developing ethanol response procedures.
- American Association of Railroads, Railway Association of Canada have both data and training materials (e.g. Rail 101) and are working on developing additional training for HHFT incidents.
- Canadian Association of Fire Chiefs has members working with educational institutions on identifying curriculum for a three level program of awareness, operations and technician level firefighter training.

Please send your request to:
NFPA
Codes and Standards Administration
1 Batterymarch Park
Quincy, MA 02169
Stds_admin@nfpa.org
Rev. 10/09

Signature: ____________________________
Name: ____________________________ (please print)
Affiliation: ____________________________
### Transport Canada – Emergency Response Task Force
**Membership as of Aug. 15, 2014**

<table>
<thead>
<tr>
<th>Membership</th>
<th>Name</th>
<th>Alternate(s)</th>
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<tr>
<td>Chair</td>
<td>Chris Powers</td>
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<td>Vice-Chair</td>
<td>Louis Laferrière</td>
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<td>Member</td>
<td>Michael Seth</td>
<td>Blaine Wiggins</td>
<td>Aboriginal Firefighter Association of Canada</td>
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<td>Arnold Lazare</td>
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<td>Member</td>
<td>Jim Bird</td>
<td>Mark Jasper</td>
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<td>Mark Ford</td>
<td>Murray Knowles</td>
<td>Canadian Association of Chiefs of Police</td>
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<td>Ken Uzeloc, Kevin Clifford</td>
<td>J.P. Cody-Cox</td>
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<td>Blake Williams</td>
<td>Hugh MacLennan</td>
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<td>Jim Jessop</td>
<td>Ted Wieclawek</td>
<td>Canadian Council of Fire Marshals and Commissioners</td>
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<td>Member</td>
<td>Bob Goodfellow</td>
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<td>Member</td>
<td>Adrian Michielsen</td>
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<td>Member</td>
<td>Jim Kozey</td>
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<td>Dennis Redford</td>
<td>Laurie Boyle</td>
<td>British Columbia Ministry of Environment</td>
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<td>Mélanie Levac</td>
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<td>James Panasiuk</td>
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<td>Marc-Etienne Lesieur</td>
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<td>Ministère de la Sécurité Publique du Québec</td>
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<td>CANUTEC, Transport Canada</td>
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<td>Executive Director</td>
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<td>Task Force Secretariat</td>
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<td>Senior Policy Advisor</td>
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<td>Lindsay Jones</td>
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<td>Policy Researcher and Advisor</td>
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<td>Special Projects Officer</td>
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<td>Francine Bigras</td>
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<tr>
<td>Director General TDG</td>
<td>Nicole Girard</td>
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<td>Transport Canada, Transport of Dangerous</td>
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Flammable Liquids Technical Advisor
Competency Profile

Purpose

Under Part 7 of the Transportation of Dangerous Goods Regulations, an organization may be required to have an Emergency Response Assistance Plan (ERAP). When an organization applies for an ERAP and receives approval by the TDG Directorate, that organization is then referred to as an ERAP-holder. The ERAP-holder’s documentation must contain a description of the capabilities of a Technical Advisor.

With the intent to improve the understanding by ERAP-holders, rail carriers, First Responders and public safety authorities, the basic role and responsibility of the Technical Advisor is to provide or be able to identify resources or information necessary for effective incident mitigation. This role - which may be filled by more than one individual but with only a single point of contact within the Incident Command System – will be to provide assistance via the telephone and at the scene of the incident.

The purpose of this document is to describe the capability/competency (expected knowledge, training, and experience) of a specific type of Technical Advisor, one for a Flammable Liquids ERAP namely a Flammable Liquids Technical Advisor (FL TA).

Scope

This document applies to all ERAP-holders who offer, transport, import or are responsible for a TDG Class 3, Flammable Liquid, ERAP in Canada and therefore, have a FL TA as required by the ERAP. The following description applies to both ERAP-holder company employees and contracted transportation emergency response service providers acting as FL TA on behalf of an ERAP holder.

Role and Responsibilities

A FL TA must be available 24 hours a day, 7 days a week.

The FL TA must be able to provide initial assistance by telephone.

The FL TA must have the authority to provide advice and assistance as well as engage necessary resources in accordance with the ERAP for the safe and effective resolution of the incident.

The FL TA must attend a transportation incident scene, as required, including requests by carrier, public authorities or mutual aid/contracted transportation emergency response service provider.

The FL TA must be able to assess a flammable liquid railway incident and provide advice on tactics and strategies for spill and firefighting response within the Incident Command System, in the areas:

a) hazards associated with the flammable liquid;
   • reactivity and compatibility with other chemicals, materials and the physical environment
   • physical characteristics
   • flammability, explosivity, by-products of incomplete and complete combustion, and
   • consequences of personnel exposure (contact, inhalation, ingestion).

b) behaviour characteristics if the flammable liquid is released;
   • physical state (solid, liquid, gas) and appearance (colour, odour)
   • density in air, water
c) hazards associated with the incident;
   • ignition sources
   • threats to
     – response team
     – population in the area
     – environment
     – equipment and property, and
     – adjacent means of containments

d) knowledge of the means of containment;
   • specifications, safety and relief valves, stenciling and safety marks
   • rail tank car damage assessment, and
   • receiving means of containment

e) response options;
   • isolation zones
   • spill
     – installation of plugs, capping of valves, stabilization, containment
     – transfer, recovery, and
   • fire suppression
     – defensive, offensive, non-intervention

f) response resources and contacts as identified in the ERAP;
   • transportation emergency response service providers (i.e. in-house, for hire, ER contractor, consultant, mutual aid).

Furthermore, the FL TA must have ready access to individuals that can provide information such as 1) potential environmental impacts of both the spill and the implemented response techniques, and 2) air dispersion modeling.

**Knowledge**

Working knowledge means having training and experience necessary to provide technical assistance to the on-scene responders as well as having resources identified to obtain more specific technical information.

FL TAs must have working knowledge for those materials for which they are responsible in a transportation incident:

a) Safety practices at an incident scene

b) TDG Regulations, GHS/WHMIS

c) safe handling for Flammable Liquids
Flammable Liquids Technical Advisor
Competency Profile

d) suitable detection equipment technologies and their limitations

e) Incident Command System

f) personal protective equipment requirements

g) railway tank car damage assessment

h) response techniques (options) available for the material and means of containment,

i) Flammable Liquids firefighting,

j) Flammable Liquids (TDG) Emergency Response Chart, A Disciplined Approach, and

k) ERAP.

Training and Experience

The training and experience qualifications of a FL TA must be documented and records maintained by the ERAP holder. The required training and experience or equivalent credentials for the FL TA must include the following at the minimum frequency shown in parenthesis:

a) Communication skills and devices

b) Company Safework Guidelines/Practices (three years)

c) TDG Certification (three years)

d) WHMIS (three years)

e) ERAP-holder’s ERAP (three years or sooner if major changes occur)

f) Incident Command System, ICS 100 and 200 are mandatory, ICS 300 is preferred (formal review/training every three years; annual exercise or participation in an incident utilizing ICS)

g) spill and firefighting response techniques – this includes response to an actual incident or taking part in a mock/drill exercise (annual)

h) NFPA 472 Hazmat Technician with Tank Car Specialty or Advanced Tank Car Specialty
   • flammability and toxicity detection equipment and limitations (annual)
   • personal protective equipment requirements (annual)
   • tank car damage assessment (three years)

i) Selected Requisite Knowledge or Requisite Skills from the following:
   • NFPA 1001 Firefighter level 1 or 2, and
   • NFPA 1081, or
   • NFPA 472.
Flammable Liquids Technical Advisor
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j) Trained in rail safety for emergency response operations
   - Valid eRail Safe card (for contractors hired directly by a rail carrier)
   - ERAP-holders FL TAs shall be vetted and documented separately (to be determined)

k) Crude By Rail (one time, 3-day course, SERTC, Pueblo)

l) Technical working knowledge of the physical and chemical characteristics of the material and anticipated hazards at an incident scene

m) Technical working knowledge of suggesting stabilization and mitigation measures that could be implemented at the incident scene, and

n) Technical working knowledge of the means of containment.

Response Tier and Timelines

FL TAs shall provide technical or emergency response advice immediately over the telephone within 10 minutes of the initial request.

FL TAs shall attend the incident scene immediately but no more than six hours of the initial request.

A response team and equipment shall attend the scene within 12 hours of the initial request.

Best efforts are expected, however, consideration must be given to natural disasters, weather conditions, site accessibility, or other circumstances such as acts of terrorism which may interfere with the above timelines.
DEFINITIONS

Credential
A document that provides an attestation or proof of standard qualification, competence, or authority issued to an individual by a recognized, accepted third party that is granted the authority to do so.

Emergency Response Assistance Plan (ERAP)-holder
An organization that has an approved ERAP.

Equivalency
Alternative that meets or exceeds the requirements of a credential, referenced standard, accepted operating procedure or guideline, or certificate granted by a recognized institution that has the authority to do so.

Mitigation
Mitigation includes operational activities directed towards assessment and initial product recovery by means of product displacement. Product displacement includes, but is not limited to, neutralization, deactivation, repackaging or over-packing, flaring or depressurization.

Response team
A response team has capable resources (i.e. people, training, experience and equipment) on a 24-hour basis to provide on-scene response to a transportation incident. The response team should be able to:

- Execute initial stabilization of the incident thereby immediately reducing the risk of chemical exposure to people and the environment (independent of response time and site access);
- Execute mitigation once an incident has been stabilized to remove the immediate risk of chemical exposure to people and the environment; and

Stabilization
Stabilization includes operational activities directed towards ensuring the incident will not escalate by being able to detect, assess, stop and contain chemical leaks or spills (or potentials thereof) caused by a transportation incident involving dangerous goods or other goods.

Transportation Emergency Response Service Provider
A for-hire organization such as a consultant or a contractor which specializes in on-scene TDG transportation emergency response activities of stabilization and mitigation.
Flammable Liquids Technical Advisor
Competency Profile

A Flammable Liquid (TDG) Emergency Response Chart
A Disciplined Approach

A process to help protect life, property and environment in a safe & efficient manner.

OBJECTIVE: Protect life, property and environment in a safe and efficient manner.

DEFINE CRITICAL OBJECTIVES

PRIORITY CRITICAL OBJECTIVES

Response Strategies

Implementation

Recovery

Clean Up & Disposal

Based on The Disciplined Approach to Emergency Response originally developed by Imperial Oil and supported by the Chemistry Industry Association of Canada (2015).

This version is sponsored by the Chemistry Industry Association of Canada (2015).

Note: Double click on this chart to enlarge
Flammable Liquids Technical Advisor  
Competency Profile

National Fire Protection Association (NFPA) Standards

**NFPA 1001: Standard for Fire Fighter Professional Qualifications**

Description - identifies the minimum job performance requirements for career and volunteer fire fighters whose duties are primarily structural in nature.

**NFPA 1081: Industrial Exterior Fire Brigade Training**

Description - provides a foundation of knowledge and skills that may be used to safely resolve emergencies involving exterior fire at an industrial facility.

Selected Topics of Interest to FL TA Competency:

- Fire science and behaviour
- Emergency service communications
- Personal protective clothing
- Firefighter Safety/personnel protection
- Self-Contained Breathing Apparatus
- Fundamentals of firefighting
- Fire service hose
- Fire Streams and appliances
- Advanced fire attack
- Overhaul and salvage
- Incident Command System
- Hazardous materials
- Reports and records
- Pre-incident planning
- Rescue operations
- Dry chemical agents and applications
- Pre-emergency planning
- Strategies and tactics

**NFPA 472: Standard for Competence of Responders to hazardous Materials/Weapons of Mass Destruction Incidents**

Selected Topic of Interest to FL TA Competency:

- Chapter 16, Flammable Liquids Bulk Storage Fire Fighting
ASSIGNED TO: Subgroup 5

SUBJECT: First Responder Training for rail incidents involving flammable liquids

ISSUE:

Lack of comprehensive and specialized first responder training standards in Canada to adequately respond to rail incidents involving the release of large volumes of flammable liquids.

OBJECTIVE:

Provide the Emergency Response Task Force (ERTF) with recommendations for submission to Transport Canada to address gaps related to first responder specialized training requirements to adequately respond to rail incidents involving the release of large volumes of flammable liquids.

TIMEFRAME:

• Call for members made in December 2014;
• Work to start in February 2015; and
• Subgroup to report and propose recommendations to Task Force in April 2015 for decision.

TASKS:

• Identify and review current First Responder training standards, and available programs, resources and facilities;
• Assess training needs of First Responders on flammable liquids;
• Identify specific qualifications, training and knowledge to be required for first responders on flammable liquids;
• Identify specific qualifications, training and knowledge to be required for Flammable Liquids-Technical Advisors (FL-TA);
• Identify gaps between current needs and existing training, programs resources and facilities;
• Identify training accreditations and accreditations authority;
• Consider funding requirements and possible funding sources/opportunities; and
• Draft recommendations to address any gap identified for ERTF decision and Transport Canada’s consideration.

BACKGROUND:

On April 23, 2014, the Hon. Lisa Raitt, Minister of Transport, announced the establishment of the Transportation of Dangerous Goods - ERTF to conduct further research, assess, evaluate and make recommendations to advance and make improvements to the Emergency Response Assistance Plan (ERAP) program to enhance emergency response and public safety.

During these meetings, several members voiced serious concerns over the first responders’ capacity to handle flammable liquids spills or fires. Firefighters have expressed their lack of knowledge about Transport Canada programs and other resources and equipment that can be made available to them on the site of an incident. Members have also expressed concerns over the limited capacity for small or remote communities to fund resources, training and provide adequate services in case of an incident involving flammable liquids.

It is evident from the following available rail data that the volume of Class 3 Flammable Liquids moving on rail has been increasing over recent years.

1) Accident Team: (SOURCE: Accident Team and Dangerous Goods Accident Information System (DGAIS))
   • Between 2013 Q3 and 2014 Q2 there have been a total of 610 release or near-release incidents reported. Of these, 474 (73%) did not result in any fire or explosion, with 5 (<1%) leading to an explosion, and 15 (2.33%) resulting in a fire.

2) Safety Research and Analysis: (SOURCE: Rail flow data from ACA)
   • Information provided by ACA has indicated that there has been an average 27,063 car per year rise in the number of railcars carrying crude oil between the years of 2010 and 2013.

Similarly, since 2010, there has been a corresponding average rise of 11,882 cars per year in ethanol and similar products carried on rail in Canada.

ISSUE:

While the proportion of reported incidents that result in a fire or explosion is low, the impact of a fire or explosion is significant. As evidenced by Lac Mégantic, a lack of standardized training and awareness in responding to Class 3 substance related incidents can result in fatal delays.
Also lacking is an existing reference to a single, comprehensive standard that can provide both industry and municipal response personnel with the information needed to identify the knowledge, skills and training required to safely and effectively mitigate these incidents.

**CONSIDERATIONS:**

Local authorities establish fire services to provide emergency response to those incidents that present the most frequent and serious public safety risks within their community. Structural firefighting is the basic service provided by most fire departments. Other services may include response to medical emergencies, motor vehicle accidents, rescue services such as ice and water rescue, confined space, etc.

Large, industrial scale, flammable liquids firefighting is not a service that most fire departments have been trained or equipped for, since historically there has not been a demonstrated need to provide this type of response capacity. The significant volume increase of flammable liquids transported in unit trains moving through hundreds of Canadian communities in recent years has introduced an important risk that fire departments are not prepared to handle. In the wake of the catastrophic event in Lac Mégantic, it became clear that firefighters and first responders were not prepared nor equipped to conduct the fire suppression operations required for such large scale flammable liquid fires and explosions.

**Legal framework and ERAP program:**

The Transportation of dangerous goods, including ERAPs, is federally regulated through the *Transportation of Dangerous Goods Act* and its associated *Transportation of Dangerous Goods Regulations*.

Following the public inquiry report on the Mississauga incident in 1980, regulations were amended to require ERAPs. Section 7 of the *Transportation of Dangerous Goods Act, 1992* was established to ensure the provision of specialized expert advice to supplement normal emergency response activities. Canadian shippers, or persons who offer for transport or imports one or more consignments of dangerous goods of Class 3 flammable liquids, are required to comply with Part 7 of the *Transportation of Dangerous Goods Regulations* by submitting an ERAP to Transport Canada for approval, prior to these dangerous goods entering the transportation system. TDG Regulation Part 7 also sets out the process to follow in order to obtain the approval of an ERAP.

If the quantity requirements outlined in column 7 of Schedule 1 of the *Transportation of Dangerous Goods Regulations* are met, a person who offers for transport or imports one or more consignments of dangerous goods must have an approved ERAP, unless that person is acting on behalf of another person for whom an approved ERAP has been assigned for the dangerous goods.
After the derailment in Lac Mégantic, Transport Canada issued Protective Direction PD 33 and subsequently amended the *Transportation of Dangerous Goods Regulations* to require an ERAP for certain Class 3, flammable liquids in packing groups I, II and III, including crude oil and ethanol.

ERAPs for flammable liquids rely heavily on effective fire suppression activities for spills that have ignited, or may ignite, making the response from local fire services an essential part of a successful implementation of an ERAP, in a safe and effective manner. However, 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, it is of little value. Furthermore, even with the best ERAP program and awareness, if first responders are not properly trained or prepared, such plans would not provide an advantage.

Case studies that followed the catastrophic events of Mississauga (1980) and Lac Mégantic (2013), have highlighted the following:

- Firefighters are not adequately trained to handle large scale incidents involving flammable liquids spills or fire;
- First responders are not aware of the resources available to them such as ERAPs and Remedial Measures Specialist;
- First responders do not have the knowledge and experience required to effectively utilize some of the specialized equipment that can be made available to them during flammable liquid incidents; and
- Small and remote communities have a very limited resource capacity (funding for access to specialty training programs and facilities, equipment, etc) to adequately respond to flammable liquid spills and fires resulting from derailments.

**Current training standards in Canada:**

At the Task Force’s request, the Secretariat conducted a survey to identify the standards currently used in Canada to train firefighters. The results confirmed that Canadian firefighters currently receive training that meets the requirements of the *National Fire Protection Association (NFPA) standards*. The NFPA standards currently used to train firefighters in Canada are:

- *NFPA 1001 Standard for Fire Fighter Professional Qualifications*; and

None of these Standards currently address the conditions, complexities and assessment needs associated with the response to large flammable liquids incidents during transport. Not only would a new or revised standard address this, it may also
raise the salience of how responding to a Class 3 substance should be done, leading to fire departments placing a greater emphasis on planning for it.

**Other training material and resources available:**

There are some specialized firefighting training programs and facilities for flammable liquids in the United States, such as the Crude by Rail Emergency Response course offered in Pueblo Colorado. However, these programs are costly for firefighters to attend. They do not take into consideration the Canadian legal framework or Canadian practices, and are usually not available in French.

Members agree that not all firefighters need to be trained to such a specialized level. However, there is a definite and clear need for some specialists in this area, especially in or near communities through which flammable liquids are transported by rail.

**What would a specialized training standard on flammable liquids need to address?**

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 combustible 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 educators, 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. Some larger
municipalities fund and train fire services to provide a greater number of emergency services and a higher level of service\(^1\), however, small or remote communities have limited capacity to fund services and rely largely on volunteers to provide services.

In reviewing existing fire service training programs which are based on *NFPA 1001 – Firefighter Professional Qualifications* and *NFPA 472 – Competencies for Response to Hazardous Materials/Weapons of Mass Destruction Incidents*, it became evident that significant gaps exist in these standards.

The specialized training standards need to address the following:

- The complexities and risks of a multiple tank car release of a large quantity of flammable liquids;
- The competencies required to provide advice to Incident Commanders on strategic and tactical considerations for large flammable liquid transportation incidents, which could be identified as a Hazardous Materials Technician-Flammable Liquids in Transport Specialty;
- Fire control strategies for large flammable liquid fires (Class B fires) resulting from transportation incidents;
- How to apply firefighting foam such as AFFF or AR-AFFF including the correct ratio of foam and water (usually 3%-6%), the correct application, so as not to agitate the flammable liquid, and its application at a rate sufficient to overcome the heat being generated by the fire and be able to blanket the surface of the flammable liquid; and
- How to operate specialized equipment brought to an incident such as foam trailers, foam educators and master stream devices etc.

Possible solution/recommendations to Transport Canada:

- Provide support to ERTF’s effort to request a new standard from NFPA revisions to current standards to provide a comprehensive reference on competencies required to safely respond to these unique types of incidents;
- Develop criteria and guidelines to fund, develop and make available and accessible training in Canada to first responders on flammable liquids;
- Identify facilities in Canada where training exercises could take place with scenarios of flammable liquids by rail;
- Review training material already available and adapt to Canada, translate in French and distribute;

\(^1\) GPAC ERAP Working Group Report and Recommendations, Jan. 31, 2014
- Develop sustainable funding model to address lack of capacity and funding of small and remote communities; and

- Develop a training curriculum for Remedial Measures Specialists and CANUTEC on Flammable Liquids Response.

As stated by Justice Grange in his public inquiry report on the Mississauga incident in 1980, the importance of training cannot be overemphasized and educational programs in preparation for emergency response to dangerous goods spills should be prepared and provided to federal representatives as well as for local emergency forces.

**NEXT STEPS:**

Members of Subgroup 5 are invited to submit to the ERTF Secretariat, **by February 6, 2015**, written comments or concerns position on this issue, along with proposals to be considered by the Subgroup that expands on the Tasks section of this Issue Paper.

Comments and concerns/position/proposal will be discussed at a meeting tentatively scheduled for February 18, 2015.