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CONSIDERATIONS FOR ENSURING THE EFFECTIVENESS OF U.S. RAILROAD HAZARDOUS MATERIALS TRAINING, PREPAREDNESS, AND COMMUNITY OUTREACH PROGRAMS[©]



FIGURE 1: PHOTO CREDIT - THE NEW YORK POST, 12/30/2013.

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**Considerations for Ensuring the Effectiveness of U.S. Freight Railroad Hazardous Materials
Training, Preparedness, and Community Outreach Programs**

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SECTION 1.

DISCLAIMER

The views and valuations expressed in this document represent those of the panel of contributors and document review team, and do necessarily reflect the opinions of any agency, organization, affiliate, or individual referred to in the document or elsewhere. While every attempt has been made to ensure that the information in this document is correct and accurate, there are no representations or guarantees as to completeness, accuracy, or reliability.

EXECUTIVE SUMMARY

In the aftermath of the February 3, 2023, train derailment in East Palestine, Ohio, many opinions have been offered on the release of multiple hazardous materials (HAZMAT) and the serious impacts the train derailment is having on community residents and the environment.

One matter that gained significant attention soon after the derailment was the efforts by multiple emergency response agencies to take on the considerable responsibilities of protecting human life and safely mitigating impacts from fires and the release of large quantities of multiple types of hazardous materials. Questions arose as to whether the emergency responders had received adequate training to handle an incident as unpredictable and potentially catastrophic as the one they were faced with resolving. By all accounts, the emergency responders performed admirably and are to be commended for their efforts and their service. By one written account, there were more than 100 firefighters from 45 to 50 fire departments that responded to the East Palestine derailment¹. They did so even though there is no clear nationwide approach or set of

¹ The Vindicator, Local Fire Crews Help in East Palestine, 02/08/2023, [Local fire crews help in East Palestine | News, Sports, Jobs – The Vindicator \(vindy.com\)](https://www.vindy.com/news/sports-jobs/local-fire-crews-help-in-east-palestine).

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standards for the HAZMAT training they put into practice so effectively and successfully over those days and weeks. There has also never been a comprehensive effort to examine the numerous and widely diverse types of rail-related HAZMAT training, preparedness, and community outreach programs and activities to create such a nationwide approach.

We believe the time has come to develop a clear understanding of the various programs in place today, as well as their intent and overall effectiveness. Unequivocally, good training and preparedness equates to enhanced safety for all involved just as the successful and safe outcome to a major rail incident involving HAZMAT depends on a coordinated effort by community emergency planners, emergency first responders, and the railroads, all working together for the same mutual objective. This is an essential prerequisite to a process of revamping and establishing an improved nationwide approach to rail-related HAZMAT training, preparedness, and community outreach. This approach will establish many long-lasting benefits and improve collaboration and coordination between the railroads, fire service, emergency management officials, and other concerned groups and organizations. We have developed this document as a first step toward this important goal.

This White Paper provides a comprehensive and fact-based discussion of the current status of rail-related HAZMAT training and information available to emergency responders, emergency management officials, and others that support community outreach and disaster aid programs through a series of seventeen relevant and related topics. We also include one hundred and ten critical questions and considerations applicable to the topics we discuss in this document and that require further examination. We considered the training, preparedness, and outreach

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programs offered by many different sources, and provided relevant factors that will need to receive further analysis in a more formal setting, and by a broader assembly of subject matter experts, to derive the maximum possible benefits.

In order to facilitate these important efforts we include several recommendations as part of this document. One is for convening a working conference that would be attended by thought leaders from across the spectrum of rail HAZMAT training, preparedness, and community outreach activities, as well as stakeholder groups affected by rail HAZMAT operations and safety. Properly constructed and facilitated, the results of such an assembly would effectively evaluate and record the opinions and consensus on the most critical topics facing rail related HAZMAT training, preparedness, and community outreach. The second is for the development of a regularly occurring post-conference review process consisting of key stakeholder groups responsible for periodic evaluation of the most critical topics facing rail related HAZMAT training, preparedness, and community outreach. Both recommendations are described in detail in Section 4.

For most of the almost two centuries that railroads have operated in the United States, they have transported a variety of products considered hazardous by today's standards. Throughout those two centuries, it was predominantly local firefighters who responded when a train derailed in their community. Fortunately, the safety of transporting hazardous materials by rail has improved exponentially over the years, and so has the content and availability of the training received by emergency responders. However, this does not diminish the importance of the process we propose to comprehensively review rail-related HAZMAT training, preparedness,

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and community outreach, and to consider actions that would make it even more effective and beneficial than it is today.

The team of contributors to this document have all acquired significant knowledge in one or more of the topics presented and have demonstrated practical experience and made many contributions to HAZMAT safety, training, emergency planning, and community outreach throughout their careers. We offer this call to action in continued service to the communities throughout the nation that rely on effective emergency response for their well-being.



FIGURE 2: PHOTO CREDIT - SOURCE UNKNOWN

SECTION 2.

PANEL OF CONTRIBUTORS AND DOCUMENT REVIEW TEAM

Unquestionably, railroad HAZMAT incidents can have serious consequences, and responding to them correctly is of the utmost importance. Therefore, to appropriately pursue a discussion as comprehensive and perhaps controversial as this one, it is important to bring together a group of individuals that possess proven knowledge, practical experience, and demonstrated leadership in a variety of rail-related HAZMAT and emergency preparedness and response issues. Also important is that the contributors can be counted on to provide impartial, accurate, and fact-based assessments of the key topics and issues.

The contributors to this document bring over 200 years of combined experience to the project and have unilaterally provided valuable time and thoughtful input in a non-partisan and unbiased manner that puts the issues squarely on the table with the hope that positive change can occur.

All but one of the contributors to this document have been active in professional careers of long duration that were directly involved with either the fire service, emergency management and planning, the freight railroad industry, the chemical manufacturing and transportation industry, and federal regulatory and oversight agencies. Their contribution to their respective fields is well-established as is their ability to work collaboratively. To help provide a more independent questioning and assessment of the work of the contributors, and to provide considerations that look beyond current-day practices, the panel was joined by a well-respected consultant recognized for his expertise in the application of strategic assessment.

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To ensure that the work of the Panel of Contributors was inclusive of all important and relevant rail-related hazmat training, preparedness, and community reach topics and questions, a three-member review team was established to evaluate the final draft document. The review team was comprised of individuals with well-established backgrounds in the chemical industry, fire service and hazardous materials response, and the rail industry. The review team provided recommendations to the Panel of Contributors aimed at improving the clarity and content of the document, the majority of which were incorporated into the final document.

DOCUMENT REVIEW TEAM

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SCOPE OF WORK

This document, while intended to provide a timely critical look at rail-related training, preparedness, and community outreach, is in no way a criticism of the U.S. rail industry or the emergency response community and it is not intended to address methods to improve the safety of HAZMAT being transported in freight trains. In many ways, this document will acknowledge the expansive depth and breadth of training and information available to emergency responders.

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Railroads, chemical shippers, trade associations, and regulatory agencies focus their preparedness efforts on improving the safety of rail operations and improving the safe handling and transportation of HAZMAT. For the most part, this document will not focus on funding such programs. While inextricably linked to all aspects of rail HAZMAT training, planning, and outreach programs, a discussion on funding would diminish the primary focus and purpose of this document.

Instead, this document will serve as a means to properly frame a comprehensive discussion of freight railroad HAZMAT training, preparedness, and community outreach programs available to emergency responders throughout the United States today.

In developing this document, the contributors sought to provide a process by which to:

- 1. Explore and present the existing state of training and preparedness programs as they relate to the transportation of HAZMAT by freight railroads throughout the United States.**
- 2. Identify what training, resources, and information emergency responders and planners need and expect; and identify a process through which stakeholders can successfully collaborate to fill identified gaps.**
- 3. Identify what currently exists and what is needed to establish a continuously effective emergency response and planning program throughout the freight rail system.**
- 4. Provide meaningful questions from which a series of evaluation criteria can be identified to measure the applicable essentiality, quality, consistency, effectiveness, reach, and sustainability, of each identified program.**
- 5. Create a more organized effort to improve cross-sector coordinated efforts in rail HAZMAT training and preparedness.**

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This document, and the collection of identified programs, will serve as a starting point for a more thorough assessment and evaluation process that can and should be conducted. The results from any additional and more thorough evaluation can provide the necessary holistic appraisal of rail-related HAZMAT training, preparedness, and community outreach programs. In addition to helping ensure the overall effectiveness of these programs, it can also enhance training coverage, identify opportunities for sharing elements of "best-in-class" programs, and instill better coordination and collaboration between all entities involved in rail-related training, preparedness, and outreach.



FIGURE 3: PHOTO CREDIT - THE DAILY BULLDOG, FRANKLIN COUNTY, MAINE, 07/15/2013.

INTRODUCTION²

The February 3, 2023, train derailment involving HAZMAT in East Palestine, Ohio, reignited concerns about the safety of the U.S. freight railroad industry, and the transportation of HAZMAT in large bulk conveyances, such as railroad tank cars and covered hoppers. Several subsequent train derailments occurring after the East Palestine incident further exacerbated concerns among the public, local, state, and federal officials as well as politicians, the media, and the railroad industry.

The current network of U.S. railroads operates in 49 states and covers nearly 140,000 miles of track. The U.S. railroad industry is not only vital to the movement of HAZMAT critical to the U.S. economy, but it also has a claim to an admirable safety record. According to the Association of American Railroads (AAR), U.S. railroads transport more than two million bulk carloads of hazardous materials a year. Of that number, 99.9% move from their point of origin to their final destination without an accident-caused release.³ However, when train accidents involving large releases of hazardous materials do occur, a well-executed emergency response by properly trained responders is critical to reducing the consequences of the incident and the impact on the community and the environment. The types of rail-related HAZMAT training available to emergency responders today are expansive and cover a wide variety of classroom, hands-on, and virtual formats, as well as multiple levels of complexity and detail, depending on the needs of the trainee.

² The various categories of freight railroads are collectively referred to as “railroads” in this document unless otherwise specifically identified as to class.

³ Freight & Rail Hazardous Materials Safety, [Railroads, and HAZMAT Safety | Association of American Railroads \(aar.org\)](https://www.aar.org), (accessed 03/30/2023).

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Training the nation's emergency managers and first responders to safely plan for and respond to rail HAZMAT incidents is a multi-pronged effort between the Federal Government, industry, trade associations, and state, local, and tribal entities. The Federal Government is active in funding emergency responder training through several grant programs managed by the Federal Emergency Management Agency (FEMA) and the Pipeline and Hazardous Materials Safety Administration (PHMSA), components of the U.S. Department of Homeland Security and Department of Transportation, respectively. Agencies such as the Occupational Safety and Health Administration (OSHA), and the National Fire Protection Association (NFPA), establish minimum training requirements⁴.

The nation's railroads, both independently and through their primary trade associations, the Association of American Railroads, and the American Short Line and Regional Railroad Association (ASLRRA), regularly publish information related to their efforts to train and educate emergency first responders and internal HAZMAT teams, and to their work with local officials on emergency planning. It should be noted that in the more than sixty years railroads have regularly been providing training to emergency responders at no cost for the training they provide. This important point seems lost in the rush to legislate that resulted from the East Palestine derailment. At the time of this writing there were eight proposed new railroad safety bills in the works – with most of them calling for the railroads to provide more funding for emergency responder training.

At the same time, the primary responsibility for the initial response to railroad HAZMAT incidents has historically been the responsibility of the many fire departments situated

⁴ U.S. Department of Labor, OSHA, Standard Interpretations / Training Requirement for Firefighter, [Training requirements for firefighters](#). | Occupational Safety and Health Administration ([osha.gov](#)), (accessed 04/10/2023).

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along rail corridors throughout the United States. The U.S. Fire Administration estimates that there are more than 27,000 fire departments in this country and over 52,000 individual fire stations. The U.S. Fire Administration also estimates that fire departments registered by their organization are staffed by approximately 1,215,700 personnel, comprising both paid and volunteer responders⁵. State, local, and tribal entities fund salaries for instructors and deliver local training that provide the foundation for HAZMAT response training efforts.

Training of these dedicated first responders has also been a priority of FEMA and the U.S. Fire Administration at their national training centers. FEMA offers a HAZMAT Operations for Railroad Incidents training program as part of its National Preparedness Directorate's training and exercise division. In addition, FEMA defines incident management standards and provides training for the Incident Command System (ICS). Associations such as the International Association of Firefighters (IAFF), the International Association of Fire Chiefs (IAFC), and the National Volunteer Fire Council (NVFC) offer focused HAZMAT training programs for firefighters and other responders.

Finally, industry trade associations, especially those that represent chemical manufacturers, petrochemical producers, distributors, and transporters, provide additional support and/or training programs to emergency responders through nationwide programs such as Chlorep[®], Transcaer[®], and Chemtrec[®], and at national training centers such as the Security and Emergency Response Training Center (SERTC) at MxV Rail, a subsidiary of the AAR⁶.

⁵ U.S. Fire Administration, National Fire Department Registry Quick Facts (fema.gov), (accessed 03/22/2023).

⁶ Security and Emergency Response Training Center, <https://sertc.org>, (accessed 04/03/2023).

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Much of the training mentioned in this section is conducted jointly between responders and railroad employees. Joint training has proven valuable as it builds relationships and increases trust between responders and railroads—trust that cannot be developed easily at an accident site.

With such a comprehensive network of rail-related HAZMAT training and information readily available, the question arises as to why there was such a loud outcry for more HAZMAT training for emergency responders following the East Palestine derailment? The answer is multifaceted, but one reason is that the scope and scale of available training is simply not widely known or as widely publicized as needed.

But even if the existing training programs availability were more widely known and taken advantage of by emergency responders the larger problem is that the nation lacks any kind of process or set of standards that captures all the necessary perspectives, opinions, needs, and concerns regarding such training in a manner that provides greater comprehension and improved consistency. The derailment in East Palestine shines a light on the need to address this problem and brings into play that many other railroad HAZMAT-related topics should be considered to ensure that a prerequisite level of training and education exists to adequately prepare all sectors

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of the emergency responder community, including emergency planners, and other pertinent public officials.

As mentioned previously, this topic has been considered many times before, albeit not in such a comprehensive manner. In March 2018, the FEMA National Advisory Council (NAC), a thirty-five-member group from “geographically diverse and substantive cross-sections” of government, academia, and the public sector, published a report, entitled “Ensuring Rail Preparedness⁷” in response to the RESPONSE Act of 2016 (P.L. 114-321). The report made seven recommendations for improving responder training and resource allocation for rail HAZMAT incidents. While all seven recommendations were accepted by the NAC and addressed by the respective agencies, the report identified gaps that continue to exist, including consistency and availability of training for responders.

Many of the previous activities in this area have focused their efforts on the fire service. While it is undeniable that fire service organizations serve as the foundation and core of emergency response, many of these efforts have fallen short due to the absence of a comprehensive evaluation of the entire response community. This includes law enforcement, emergency managers, community planners, politicians, and a host of others who play vital roles when these events happen. While this review focuses a great deal on the fire service, it was completed with an eye to the needs and gaps that exist within the larger “response community.”

The time has come for a comprehensive and well-thought-out independent evaluation of railroad HAZMAT training, preparedness, and community outreach initiatives, focused on ensuring that those emergency responders and planners with the potential of being impacted by a

⁷ www.fema.gov/sites/default/files/2020-08/fema_nac-report-response-act_03-2018.pdf, (accessed 04/05/2023).
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rail HAZMAT incident, are being provided the correct training and necessary planning and preparedness information, in a consistent manner, and by qualified instructors who follow a vetted lesson plan that includes established learning objectives.

The discussion and questions below offer initial considerations for evaluating freight railroad community HAZMAT training, preparedness, and community outreach programs nationwide. The discussion will also identify and recommend mechanisms for conducting such an evaluation to ensure it is fair, independent, and accurate, and that it further enhances the value and quality of this critical public service provided by the nation's railroads and other important stakeholders, to the first responder community.



FIGURE 5: PHOTO CREDIT - ULSTER COUNTY NEW YORK GOVERNMENT, 10/25/2017.

INTENDED RESULT

The collaborators on this document feel strongly that establishing a process for conducting the proposed evaluations discussed below will result in many positive safety

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improvements and produce better outcomes for emergency responders, especially incident commanders. Conducting a comprehensive assessment and evaluation of the topics and questions presented will also bring about a revamped and improved approach nationwide to rail-related HAZMAT training, preparedness, and community outreach. This document is intended to serve as a stimulus and a starting point that would bring together a group of knowledgeable and experienced individuals from across the spectrum of rail-related HAZMAT training, preparedness, and community outreach programs who would be willing to work together in achieving a common goal. The improved collaboration and coordination that would be created by such an approach between the railroads, first responders, emergency management officials, and other concerned entities, will have many long-lasting positive benefits.



FIGURE 6: PHOTO CREDIT - MICROSOFT WORD STOCK IMAGE.

SECTION 3.

CONSIDERATIONS

Effective and ongoing training, preparedness, and community outreach must be “evergreen” if it is to remain relevant and ensure necessary response skills and capabilities. Such efforts must be applied at regular intervals if the response community’s skill sets are to be maintained at adequate levels. Undeniably, this is not an easy task, especially considering the complexities associated with responding to a railroad HAZMAT incident. The need for training combined with incident complexities and the sheer number and locations of public sector emergency responders who need the training applies further complications in regularly reaching even the minimum population of emergency responders and community planners. Perhaps one of the greatest challenges in this area is the considerable turnover rate of our nation’s firefighting forces, estimated to be between 10% - 20% annually⁸. According to the Bureau of Labor Statistics, it is expected that there will be 28,000 openings for firefighters each year on average to fill voids created by those leaving the workforce, moving to different occupations, or retiring.⁹

Furthermore, railroad incident HAZMAT training is just one more topic that first responders need to know about, and to a certain extent become proficient in. Most fire departments are already overwhelmed with firefighting training, rescue training, incident command training, emergency vehicle operations, annual safety training, and emergency medical training, which constitutes more than 95% of their actual response duties. The constraints on

⁸ Fire Engineering, Recruit, Train, and Retain (Sargent, Dreiman, Jose), July 19, 2022, [Recruit, Train, and Retain - Fire Engineering: Firefighter Training and Fire Service News, Rescue](#).

⁹ U.S. Bureau of Labor Statistics, Occupational Outlook Handbook, Firefighters, [Firefighters: Occupational Outlook Handbook: U.S. Bureau of Labor Statistics \(bls.gov\)](#), (accessed 04/12/2023).

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emergency responder training are further taxed by the lack of adequate backup personnel to stand in for colleagues when they are away from their duties being trained.

Another major consideration is how to appropriately recognize and quantify the value proposition of the many HAZMAT related programs that the railroads (and in a similar manner the chemical manufacturing and distribution industries) make available to emergency responders voluntarily. In the more than sixty years that the railroads have been providing training and emergency planning information, the demand by the public sector for this training and planning information has not diminished. Railroads have always strived to adapt their awareness and familiarization training programs to meet the needs and time constraints of the emergency responders. Railroad personnel have spent countless hours conducting evening and weekend sessions at firehouses, providing tours and demonstrations at rail yards, participating in tabletop drills and full-scale exercises, and providing detailed familiarization training using sophisticated “safety trains.” Clearly, the void that would be created should the railroads cease to offer this training and emergency planning information would significantly diminish the ability of emergency responders situated along the nation’s rail corridors to respond safely to a rail-related incident.

ACKNOWLEDGEMENT OF PREVIOUS WORK AND RESEARCH

This is certainly not the first time this topic has been considered or where research has been conducted. Such work has often been initiated in the aftermath of other catastrophic events such as the terrorist attacks of September 11, 2001, and the Lac-Mégantic, Quebec, rail disaster in 2013. Mentioned previously was FEMA’s National Advisory Council report, entitled

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“Ensuring Rail Preparedness,”¹⁰ and there have been other attempts to address this topic.

However, there does not seem to be any previous research that studies all of the considerations we introduce in this document related to railroad-specific HAZMAT incident response training, preparedness, and community outreach.



FIGURE 7: PHOTO CREDIT - TALES FROM THE PLAIN.

TOPICS FOR EVALUATION

1. Scope of Organizations Providing Railroad-Related HAZMAT Training:

The introduction section of this document identifies the primary bodies involved in providing instruction on railroad HAZMAT training, preparedness, and community outreach, including railroads and their trade associations, the fire service and their various academies, and

¹⁰ www.fema.gov/sites/default/files/2020-08/fema_nac-report-response-act_03-2018.pdf, (accessed 04/05/2023).
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the chemical and petrochemical industry and their trade associations. There are also a wealth of valuable conferences around the country focused on HAZMAT response with a good deal of rail-specific training. Additionally, training is also provided by recipients of Federal grants, such as the Center for Rural Development, a Kentucky-based not-for-profit that includes public safety training as one of its offered services¹¹. Other organizations that provide training include formal training schools such as those at MxV Rail in Pueblo, Colorado, Texas A&M University, and the University of Findley, to name several of the more well-known training centers. Some privately owned environmental and HAZMAT response companies also provide HAZMAT training independently on behalf of the railroads. Many for-profit companies and LLCs provide HAZMAT-related training on a wide variety of HAZMAT-related topics. Some of these providers are highly regarded and their programs are widely attended. However, there is little publicly known about the qualifications of instructors, or the accuracy of content offered by others.

Critical Questions and Considerations:

- A.** The sole uncompleted recommendation from the FEMA NAC resulting from the RESPONSE Act report was the development of a central “toolbox” for training awareness. Where should such a central repository be housed and what media is best?
- B.** What are the primary categories of training entities (e.g. railroads, fire academies, universities, and other not-for-profit HAZMAT training centers, etc.)? What are their respective strengths and weaknesses?

¹¹ Rural Domestic Preparedness Consortium, <https://centertech.com/rdpc>(accessed [2](#), (accessed 04/10/2023)).
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- C.** What are the other entities such as environmental response companies that conduct HAZMAT training on behalf of the railroads?
- D.** What is the best way to identify and catalog all the different entities that provide rail-related HAZMAT training to emergency responders? Do the NFPA standards for Awareness, Operations, Technician level training adequately cover the spectrum of needs?
- E.** Is there any requirement or coordination between these entities to ensure the adequacy of training content and quality?
- F.** Which training entities are most effective in regularly providing reoccurring rail-related HAZMAT training to emergency responders that need it the most?
- G.** What benefits would be gained by rail-related training providers being required to provide a summary of their course content, trainer qualifications, and list of departments trained to a central national “clearing house?”

2. Essential Railroad Training for Emergency Responders and Formats Provided:

Perhaps the most critical question in considering the effectiveness of rail-related HAZMAT training, preparedness, and community outreach is what constitutes the essential or minimum baseline information that should be provided? The answers to these questions may depend on role and responsibilities (responder vs. planner), level of need, and delivery format (classroom, hands-on, computer-based, self-study).

There are some self-study training guides for emergency responders on how to safely respond to a railroad incident. For example, CSX Transportation, advertises its Emergency

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Response to Railroad Incidents Self-Study Training Program which is available on line or through a printed workbook:

“In an effort to make training more available to more responders, CSX Rail has developed a free self-study training program for emergency responders, "Emergency Response to Railroad Incidents." This program covers basic issues such as responder safety, initial response procedures, locomotives and freight cars, and paperwork. It is designed for all levels of responders in fire, police, emergency management, and emergency medical agencies. Personnel who complete this program and send completed quizzes back to us will receive certificates of completion¹².”



FIGURE 8: PHOTO CREDIT - HRE INTEGRITY LLC.

¹² CSX, Emergency Responder Training, and Education, [Emergency Responder Training and Education - CSX.com](https://www.csx.com/emergency-responder-training-and-education), (accessed 04/06/2023).

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Critical Questions and Considerations:

- A. Should there be a national required curricula for rail HAZMAT training for emergency responders?
- B. Should self-study programs offered by railroads be further evaluated to help determine if a larger number of emergency responders can be regularly trained on rail HAZMAT response topics?
- C. What railroad-specific safety training components should be considered mandatory?
- D. How should these needs be balanced against HAZMAT training requirements to gain the best outcome when the time available and needs compete against each other?
- E. What are other means by which any of this training can be handled (i.e. cab cards that have pictographic information)?
- F. What might be considered a best practice or industry standard for this (perhaps similar to NFPA 470) that might be established?
- G. What mix of training methods would provide the best return on time? For example, online self-paced training coupled with onsite hands-on practical training?
- H. For training to be effective, it must be repeated and coupled with drills and exercises. How do we develop and ensure the appropriate cadence of repetitive training?
- I. With limited time availability and increasing training demands on responders, how do we balance these needs with the other existing demands (i.e. firefighter training, incident command training, EMS training, etc.).
- J. What is the chemical manufacturer's/shipper's role in developing and disseminating training and emergency response information to the railroads and other emergency responders?

3. Geographical Reach of Railroad-Related HAZMAT Training:

The expanse of the U.S. freight rail network and its reach throughout 49 states can make any commitment to help train and prepare emergency responders a sizable responsibility. Class 1 railroads¹ which comprise the largest of the freight railroads, with the largest operating revenues and most miles of track, operate through a multitude of individual jurisdictions, including hundreds of emergency response agencies and thousands of personnel.

It is also important to note the need to provide emergency managers and planners clear information to properly define the threats facing the community they live, work, and participate in and to provide the training and resources needed to effectively plan for and respond to railroad incidents. However, the nation's railroads, often in collaboration with the chemical industry, have successfully provided multiple types and levels of training and preparedness information for more than sixty years in the thousands of communities they operate in across the nation. Although some tracking of training activities conducted by the railroads does exist (e.g. TRANSCAER[®]), there is no known means to effectively capture the locations and many different types of training and information provided to emergency responders and emergency management officials. And, as previously identified, there is a real need for a central point of collaboration, coordination, and analysis of those initiatives.

Critical Questions and Considerations:

- A.** With multiple sources of training, how do we ensure that available HAZMAT-related training adequately reaches the necessary urban, metropolitan, and rural area emergency first responder populations?

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- B.** What type of approach or solution can enable a coordinated identification of target areas and specific departments/communities for HAZMAT-related training?
- C.** How can changes in shipping patterns result in new target areas being identified and training needs addressed?
- D.** How do railroads ensure they reach an acceptable population and coverage of emergency first responder agencies within their operational area?
- E.** How can multiple training providers better coordinate their training?
- F.** What is considered the universally accepted minimum rail HAZMAT training requirement for a responder?
- G.** What might be an acceptable method/metric to measure the total number of emergency first responders trained annually? Who is best to accomplish this and what actions are necessary to ensure this can be accomplished?
- H.** What is the value or benefit of knowing the total number of emergency responders and locations trained on rail-related HAZMAT topics annually?
- I.** What might be a standard methodology that could be utilized by training providers to ensure adequate and regular coverage throughout the country?
- J.** How can we assess what specific needs for tribal communities may remain unmet today?
- K.** What tools can we develop/provide to help the response community make the best decisions in this area?

4. Consistency of Program Content and Qualification of Instructors:

A wide variety of training materials and methods of instruction are utilized by the railroads and Federal grantees in their HAZMAT training and outreach programs. Rail operations are unique and less familiar than other forms of transportation as are the safety hazards associated with a railroad environment and in responding to a railroad HAZMAT incident.

With so many different types of rail HAZMAT training available from a variety of sources, is there any certainty that emergency responders are receiving the training content consistently and adequately? There are instructor requirements in place for many of the required fire service and government-developed training programs, but it is unclear what training qualifications, other than experience, are required by individuals providing instruction for non-fire service and government training programs. However, the instructors providing HAZMAT training from the railroads and chemical and petrochemical industries typically have significant knowledge and experience, and in most cases are exceedingly well-qualified to train emergency responders.

Critical Questions and Considerations:

- A.** How should the content of the training provided be assessed to ensure it is adequate for the needs of the emergency responders being trained?
- B.** What best practices might be adopted by all training providers to ensure consistency in the training they provide?
- C.** What benefits would be gained by establishing a central point of coordination to maximize training effectiveness and adequate coverage?

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- D.** Should a process for ensuring consistency in training content exist?
- E.** What specific topics (e.g., safety around live tracks, air brake lines, placard identification, etc.) should be considered for inclusion in every training program?
- F.** How does each training provider develop training content and curriculum? Do they develop adequate training standards, training plans, lesson plans that are tied to each objective, and evaluation tools to determine if training objectives were met? Are there best-practices in this area?
- G.** With multiple railroads and federal grantees providing HAZMAT-related training to emergency first responders, what could a process look like for ensuring the consistency of training content, curriculum, materials, and instructor method between the participating railroads?
- H.** Most of the current training focuses on tank car identification, hazard communication, information availability, and access, and dealing with leaks from valves and fittings. However, is there a need for more focused training on how railroads fit into the incident command structure and how railroads, contractors, responders, and leaders interact and communicate?
- I.** How do we establish consistent exercises in conjunction with the training that includes responders, railroads, emergency managers, community leaders, and others to foster resiliency?

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5. Training Program Accreditation and Attestation:

Program accreditation helps to provide a more formal validation of the content quality and consistency of the training provided, while program attestation provides more of a verification or confirmation that the training was provided. While different in meaning and rigor, both training program accreditation and attestation help to ensure the overall effectiveness of HAZMAT training programs. Some training programs in place today do provide some form of accreditation or attestation, however, there does not appear to be any consistency or expectation that training be required to meet certain standards or best practices.

Critical Questions and Considerations:

- A.** Given the various considerations and questions provided above, what benefits would be gained from the adoption of an accreditation process for railroad-provided training, which would help ensure the necessary consistency of content, quality, and instructor experience and qualifications?
- B.** What are the pros and cons of such an accreditation process being designed and self-administered by the railroads or grantees?
- C.** Should there be some involvement by the emergency first responder community, and/or appropriate regulatory agencies in a railroad accreditation process? If so, why?
- D.** How are potential training methods and training content conflicts avoided?
- E.** What would be the value of developing a central repository to collect and record rail HAZMAT training? Would it be voluntary? Where would it reside?

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FIGURE 9: PHOTO CREDIT - HRE INTEGRITY LLC.

6. Use of Safety Trains Operated by Railroads and Trade Associations:

Most Class 1 railroads now operate their own safety trains with their internal personnel providing detailed hands-on HAZMAT-related training for emergency first responders. These training aids on wheels usually consist of one or more tank cars representing those that transport pressurized and general service (low pressure) commodities. Safety train configurations can also include classroom cars, and flatcars containing an array of typical valves and fittings most commonly seen on tank cars transporting HAZMAT. Training using this specialized equipment normally involves safety around railroad tracks, rail cars and locomotives, and also specific

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training covering in all aspects of HAZMAT by rail, including shipping documents, placards, common commodities transported, tank car construction, and internal railroad procedures for responding to a HAZMAT incident.

Participating railroads invest a significant amount of money in the construction of these safety trains, as well as the ongoing operational expense associated with each of the training sessions they conduct. Similarly, the Short Line Safety Institute has operated a safety train leased from the Firefighters Training and Education Association to conduct training on short line and regional railroads. The level of sophistication of the various safety trains is impressive, and the use of these full-scale training devices is considered to be the gold standard of HAZMAT training offered by the railroads today. This is especially true given that on-site training (also referred to as mobile training) reduces travel time for responders, limits time away from other duties, eases the burden of lost wages and backfill/overtime, and connects responders with railroad personnel collaboratively before an incident occurs.

Regarding possible options for operating additional safety trains in the U.S., there could be value in exploring the safety train that operated in Canada for almost thirty years. Before it was removed from service in 2018 due to structural problems and repositioned as a stationary training aid at the Fire and Emergency Training Institute at Pearson International Airport, the TRANSCAER® Safety Train was operated by the Chemistry Industry Association of Canada (CIAC) in conjunction with the Railway Association of Canada (RAC). The CIAC, RAC, and Transport Canada (similar in responsibilities to U.S. DOT) have completed detailed design drawings and cost estimates and are well on their way to securing funding for the anticipated launch of a new Safety Train later in 2023. Upon completion, the new tank car will embark on a cross-country tour to raise awareness about rail safety and emergency response for transportation

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incidents involving dangerous goods.^{13, 14} Some of that collaborative effort, being relatively fresh, could provide insight into other alternatives for funding, owning, and operating additional safety trains in the U.S.

Critical Questions and Considerations:

- A.** What is the degree of need for additional safety trains or other mobile training platforms to ensure adequate coverage and availability of training for emergency first responders across the U.S.?
- B.** Many communities with railroads operating through them are without adequate rail sidings or yard tracks that could allow for the safe positioning of a safety train. What other training platforms can adequately meet this need to bring training to these communities?
- C.** How do we build redundancy that addresses concerns about the long-term support and operational viability of safety trains by the railroads and the Short Line Safety Institute? What commitment is there from the railroads?
- D.** What process could be used to build and operate additional safety trains? If federal funds are focused on these important training devices, what oversight mechanisms (i.e. nonprofit owner with oversight board comprised of various stakeholders) can ensure the best utilization and availability across the country?

¹³ CIAC | ACIC, TRANSCAER® Safety train retires after nearly 30 years. <https://canadianchemistry.ca/>, (accessed 04/11/2023).

¹⁴ CIAC | ACIC, TRANSCAER® thanks companies supporting the new Safety Train project. <https://canadian.ca/>, (accessed 4/12/2023).

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- E.** Are there other options and ideas for creating other mobile training platforms that provide the same level of detail and realism as training tank cars, but are easier to transport (e.g. via highway) to training locations? What are the benefits?
- F.** How do we establish greater buy-in to increase the use of safety trains and other mobile training platforms for ongoing exercises between first responders, local emergency planning committees (LEPC), community leaders, emergency managers, and railroads?
- G.** What can be learned from the Canadian safety train experience described above?

7. Railroad Industry AskRail® Mobile App Safety Tool:

The introduction of the AskRail® mobile application provided a significant electronic aid to emergency first responders by allowing for the identification of rail car contents through the use of a cell phone or computer. According to the AAR, AskRail® was introduced in 2014, as a collaborative effort between the emergency response community and North American Class 1 railroads. The AAR indicates that more than 37,000 emergency first responders are equipped with the app from all fifty states. The AAR also states that the railroads work with first responders to update the app with new features and enhancements¹⁵.

Railroads typically discuss the availability of AskRail® during their training sessions for emergency responders. It is also discussed during courses conducted at the Security and Emergency Response Training Center (SERTC- MvX) located in Pueblo, Colorado. As railroads increasingly move to electronic train lists, replacing the long-time use of printed train lists

¹⁵ AAR, Freight Rail's AskRail App Supports First Responders - Association of American Railroads (aar.org), accessed 04/11/2023).

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maintained by the conductor, the role of the AskRail® app to assist emergency responders in getting accurate train list information if the conductor cannot be located, is an option communicated by the railroads and is discussed more fully in Topic 16, which deals with advance community notification of HAZMAT trains.



FIGURE 10: PHOTO CREDIT - THE ASSOCIATION OF AMERICAN RAILROADS.

Furthermore, the AAR has indicated quite recently that it is aggressively working with Class 1 railroads to expand the distribution of AskRail®.

"AAR reported that the industry "is expanding its efforts to get the AskRail app (which provides real-time information about the contents of every car in a train and the safe handling of those contents in the event of an accident) into the hands of every first responder by directly targeting emergency communication centers to promote broader access versus relying solely on individual downloads." Railroads, the association said, are also targeting all 50 state fire associations. "If successful, these measures should dramatically

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increase the number of first responders that have access to AskRail, to double the number of first responders who have access to the tool by the end of 2023," AAR said¹⁶."

Critical Questions and Considerations:

- A.** Is the number of emergency responders using the app still accurate? Has the number of users remained constant, or has there been a decline or increase in the number of users? What can the increase or decline be attributed to?
- B.** How do railroads ensure adequate coverage and use of AskRail[®] across their networks?
- C.** What difficulties, if any, have responders experienced maintaining access to the AskRail[®] system?
- D.** What is the internal method used by fire departments and emergency managers to train those within their organizations in the use of AskRail[®]?
- E.** Are all Class 1 railroads equally effective in their outreach programs for alerting emergency first responders to the availability of Ask Rail[®]? What metrics are established or needed to ensure responders are aware of the availability of AskRail[®]?
- F.** How is the effectiveness of Ask Rail[®] evaluated by the railroads?
- G.** Besides those identified above (such as at training classes), what other opportunities and/or venues might be available to communicate the availability of AskRail[®] to emergency responders and community emergency managers?
- H.** Does the AAR still maintain and regularly meet with the public sector task force established when AskRail[®] first became available to emergency responders? If not, what process is used to work with emergency responders on new features for AskRail[®]?

¹⁶ Railway Age, Marybeth Luczak, AAR Outlines Key Class 1 Safety Actions, 03/28/2023, <https://www.railwayage.com/freight/class-i/aar-class-is-taking-action-on-safety/>
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- I. What process is used to ensure continued advancement in the overall value and functionality of the AskRail® tool?
- J. How is AskRail® utilized in areas without adequate internet or cellular connectivity?
- K. AskRail® has been made available as a desktop application for Public Safety Answering Points (dispatch centers). Is the functionality any different than the mobile app version?
- L. What would be the impact if AskRail® utilized a push notification approach to push incident notification and information to subscribers instead of waiting for the subscriber to log on?
- M. AAR indicates aggressive steps to get AskRail® into the hands of every firefighter. Is this achievable or even necessary?
- N. Are there other technologies (existing or envisioned) that could expand or supplement AskRail's® capabilities to communicate with and assist emergency responders, *emergency managers, etc.*?

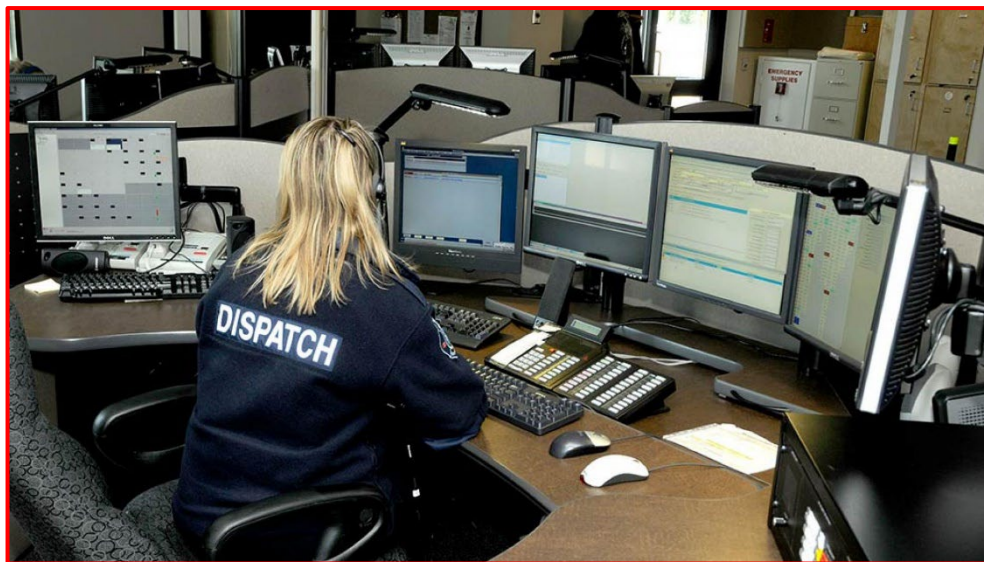


FIGURE 11: PHOTO CREDIT – CITY OF SURREY, BC, CANADA.

8. Advance Community Notification of HAZMAT Trains:

Legislative or public demands to notify a community in advance of HAZMAT that will be transported through it is a topic that has been widely debated, and the value and impact of providing this information warrants thorough evaluation. The pros, cons, and practical implementation by both railroads and local emergency responders should be considered. The recent derailment in East Palestine saw additional calls for providing communities with advance notice of HAZMAT trains preparing to move through a community. Traditionally, responders have expressed that too much information becomes a distraction and, at times, information overload. Railroads educate emergency responders and planners that the make-up of different HAZMAT commodities and quantity can vary greatly daily and from train to train, although there may be historic consistency in the types of U.S. DOT hazard classes that are transported in high volumes through a community (e.g. flammable liquids). Given the challenges inherent in preparing to mobilize an emergency response based solely on an often-varying daily train consist, communities with a sophisticated enough 911 dispatch center capability could possibly receive advance information and disseminate it to emergency responders should a train incident occur. However this information will likely be rapidly provided by the railroad itself without the community having to manage volumes of train data on an almost real-time basis. Commodity flow studies may be the more practical option for emergency planners and responders to prepare for various scenarios.

Related to this is the progression towards eliminating printed train lists (also referred to as train consists) and replacing the list with an onboard electronic device (e.g. tablet) carried by a member of the train crew. For years, one of the most important training points for emergency responders and railroad employees alike was to obtain the printed train list from the conductor

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that contains the location and information on every hazardous materials car in the train, along with useful emergency response information. PHMSA has granted several special permits for railroads to test this new approach, with each of the railroads required to provide adequate proof that alternate means of providing train HAZMAT information could be provided to emergency responders before the special permit was granted. In most cases, this is accomplished with a mobile device that the train conductor has in their possession and that is equipped to provide the same information as provided on the printed train consist, or alternately by faxing or sending electronically a copy of the train list to the local emergency dispatch center if the conductor cannot be located.

The AAR recently announced that it has begun a pilot with emergency management agencies in Sumner County, Tennessee, to add AskRail® to its emergency management dispatching system:

“AAR, in partnership with emergency management agencies in Sumner County, Tennessee, have piloted the addition of AskRail data to their emergency management dispatching system to ensure all first responders have accurate, timely information in the event of a rail emergency. By training and working with dispatch centers, every first responder who arrives at the scene of a rail emergency can be assured they will have the right information to respond to the incident effectively. AAR's HAZMAT Committee and its AskRail Task Force, consisting of representatives from railroads, emergency management agencies, and first responders, also developed a new training module specifically for Emergency Communications Centers (ECCs) on effectively using the AskRail app to support first responders and emergency planners.

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The Sumner County test pilot is just the freight rail industry's first step to expand access to AskRail. Railroads are working on running a similar pilot in Canada before the program is rolled out to emergency communication centers across North America¹⁷.”



FIGURE 12: PHOTO CREDIT - KOIN 6 PORTLAND, 06/23/2016.

Critical Questions and Considerations:

- A. With such a potential advancement in technical assistance for community emergency dispatching systems, how might legislative calls for advance notification of HAZMAT trains be resolved?

¹⁷ AAR, Add AskRail to Emergency Response Dispatch Centers to Increase First Responder Information Access, April 2023, [Freight Rail's AskRail App Supports First Responders - Association of American Railroads \(aar.org\)](https://www.aar.org/askrail)

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- B.** What is the opinion of fire department chief officers and HAZMAT response unit supervisors on the value of receiving this information?
- C.** What are the fact-based advantages and disadvantages of advance notice of certain HAZMAT trains?
- D.** How would the information be provided by the railroads and who in the community would receive the information? What would they then do with it?
- E.** What would be an adequate risk metric to determine which materials would require notification? Is notification needed for all HAZMAT (e.g., every intermodal train with many small packages or one sulfuric acid tank car)?
- F.** How far in advance of the arrival of the train would the information need to be provided to prove useful?
- G.** What actions would emergency first responders be expected to take upon receipt of this information?
- H.** With the railroad industry moving quickly to the use of electronic train lists what is the best method to notify and train emergency responders and emergency management officials on this change and alternate methods of obtaining train list information if the train crew cannot be located?
- I.** How familiar are emergency responders with the eventual move from printed train consists to the HAZMAT information being available on a mobile device in the possession of the train conductor?
- J.** If prescriptive regulatory driven requirements for utilizing AskRail® to provide notice of a rail incident to potentially impacted communities are put into place, how will such requirement account for the various types and amounts of HAZMAT typically transported?

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Will notification requirements (e.g. distance radius from incident location) be the same for all trains or scalable depending on the amount and types (e.g. corrosive or combustible liquids, vs. flammable or toxic gases?) of materials in the train?

- K.** If prescriptive regulatory driven requirements for utilizing AskRail® to provide notice of a rail incident to potentially impacted communities are put into place, what will be the requirements and/or expectations of the emergency response agencies receiving the information?

9. Community HAZMAT Commodity Flow Studies Provided by Railroads:

Perhaps one of the greatest myths surrounding railroad HAZMAT training, preparedness, and community outreach, is that the railroads do not provide fire departments and emergency planners with information on what HAZMAT commodities move through a community. Quite to the contrary, railroads have regularly provided HAZMAT density flow studies to community fire and emergency planning agencies for more than 50 years. Although the format may vary slightly from railroad to railroad, the information usually covers a full calendar year and provides the proper shipping name of the hazardous material, standard transportation commodity code number (STCC), the four-digit United Nations or North American code number (UN/NA Number), U.S. DOT hazard class number, and the number of loaded cars transported. The commodity flow study provides this information on all HAZMATs transported through the community by the railroad.

If used correctly, the commodity flow study delivers valuable information to a community by providing the specific types and amounts of HAZMAT that are transported

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through a community by a railroad. Such information helps in identifying specific training topics for firefighters. Historically, access for requesting HAZMAT commodity flow information has been made available through the AAR document “Recommended Railroad Operating Practices for Transportation of Hazardous Materials (OT-55)”, which contains a requirement for AAR railroad members to provide commodity flow information when requested (<https://public.railinc.com/sites/default/files/documents/OT-55.pdf>):

“Upon written request, AAR members will provide bona fide emergency response agencies or planning groups with specific commodity flow information covering all hazardous commodities transported through the community for 12 months in rank order. The request must be made using the form included in Appendix 3 by an official emergency response or planning group with a cover letter on appropriate letterhead bearing an authorized signature. The form reflects the fact that the railroad industry considers this information to be restricted information of a security-sensitive nature and that the recipient of the information must agree to release the information only to bona fide emergency response planning and response organizations and not distribute the information publicly in whole or in part without the individual railroad's express written permission¹⁸.”

One particular concern that has been voiced by the railroads is the possible security concerns associated with sharing this information. This became particularly true after the terrorist events of September 11, 2001. To the credit of the railroads, they have continued to provide this information when requested by bona fide fire departments and emergency planning agencies.

¹⁸ Association of American Railroads, Recommended Railroad Operating Practices (OT-55), April 30, 2021.
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Table 2-A
Top 25 Hazardous Materials Transported in bulk quantities by CSX Transportation 2012

RANK	HAZMAT STCC 7	HAZMAT STCC Description	HAZMAT UNNA Code	HAZMAT DOT Class Code	Carsloads
1	4909152	ALCOHOLS, N.O.S.	UN1987	3	76,818
2	4905752	PETROLEUM GASES	UN1075	2.1	22,808
3	4935240	SODIUM HYDROXIDE SOLUTION	UN1824	8	18,404
4	4945730	SULFUR, MOLTEN	NA2448	9	13,941
5	4961605	ELEVATED TEMPERATURE	UN3257	9	13,857
6	4917403	SULFUR, MOLTEN	UN2448	4.1	13,273
7	4930040	SULFURIC ACID	UN1830	8	12,802
8	4910165	PETROLEUM CRUDE OIL	UN1267	3	9,157
9	4960196	ENVIRONMENTALLY HAZARDOUS	UN3082	9	8,952
10	4920523	CHLORINE	UN1017	2.3	8,202
11	4904210	AMMONIA, ANHYDROUS	UN1005	2.2	7,133
12	4921598	PHENOL, MOLTEN	UN2312	6.1	6,886
13	4909351	XYLENES	UN1307	3	6,565
14	4930247	PHOSPHORIC ACID SOLUTION	UN1805	8	6,465
15	4845195	WASTE POLYCHLORINATED	UN3432	9	6,027
16	4930228	HYDROCHLORIC ACID	UN1789	8	5,748
17	4907265	STYRENE MONOMER	UN2055	3	4,890
18	4918311	AMMONIUM NITRATE	UN1942	5.1	4,825
19	4905421	PROPANE	UN1075	2.1	3,273
20	4904509	CARBON DIOXIDE	UN2187	2.2	3,148
21	4908132	CYCLOHEXANE	UN1145	3	2,471
22	4918734	AMMONIUM NITRATE, LIQUID	UN2426	5.1	2,443
23	4918723	SODIUM CHLORATE	UN1495	5.1	2,301
24	4908105	ACETONE	UN1090	3	2,299
25	4961110	ENVIRONMENTALLY HAZARDOUS	UN3077	9	2,285

FIGURE 13: IMAGE CREDIT - CSX TRANSPORTATION, 2012.

Critical Questions and Considerations:

- A. To what degree is this available information being widely used by the current generation of emergency planners? How could its use and effectiveness be increased?
- B. Are there any known instances of misuse (i.e. released to the media) of the commodity study information? If so, what was the follow-up action taken by the railroad?
- C. What variations are there in the format of HAZMAT density flow studies provided by the railroads? How might variations be aligned or resolved?
- D. Although the railroads indicate that this information is readily available to authorized recipients, what other obstacles exist for their distribution to planning organizations?
- E. How should these studies be integrated into responder training to have the greatest effect?

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- F.** What benefits could be gained from developing a central repository for density/route studies to enable evaluation-based awareness by communities? For instance, a community without a study could use the studies from the adjoining communities to understand what moves through the community by comparing the two studies and eliminating the HAZMAT that originates or ends in the community.
- G.** How can/should the commodity flow data be used by community officials to develop their emergency preparedness plan?

10. Full Scale and Tabletop HAZMAT Drills and Exercises:

Responder training without practical application of the topics taught does not fully close the preparedness and response loop. Full-scale rail-related HAZMAT drills designed to teach, apply and evaluate skills at the task-level and comprehensive exercises designed to practice an evaluate systems, procedures, and plans, are considered to be the penultimate step in building and testing emergency responder confidence in responding to an actual rail HAZMAT incident, such as a derailment with a release, or a non-accident release due to a faulty valve or fitting on a tank car. The practical application of skills, tactics, and safety measures, taught in more conventional HAZMAT training sessions is an important component in the overall rail HAZMAT training compendium.

HAZMAT exercises come in a variety of formats, such tabletop, functional, and full-scale . Each have a particular training purpose and goal in mind. While considered to be an important part of rail HAZMAT-related training, the logistics and practicality of conducting drills and exercises regularly to a large number of departments is more difficult to achieve.

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Some fire training academies and HAZMAT schools, such as Texas A&M and MxV's SERTC, conduct extremely realistic full-scale exercises at a stationary training site location, meaning that its availability is dependent on the ability of the emergency responder to travel to the training location. The railroad's safety trains are capable of providing on-site drills or exercises, but, again, the logistics of moving and staging equipment does limit the number of drills that can be conducted over a year.

Critical Questions and Considerations:

- A. What benefits could be gained if drills and exercises followed the Homeland Security Exercise Evaluation Program (HSEEP)¹⁹?
- B. What would be the impact of drills being made mandatory or highly recommended?
- C. What components of a drill are most critical for instances where training time is limited?
- D. What would be the impact of making the conducting of drills and/or tabletop exercises an expected part of a railroad's preparedness training for emergency responders?

11. Availability, Quality, and Consistency, of Third-Party Provided Training:

Similar to the questions raised above, some railroads and Federal grant recipients utilize the services of third-party vendors, such as environmental response contractors, to provide HAZMAT-related training to emergency first responders, while others provide this training independently as for-profit companies. Examples of third-party training include specially equipped trailers outfitted with training aids (e.g., common tank car valves and fittings), tabletop exercises, and specialty classes such as HAZMAT chemistry. Third-party training is an may

¹⁹ FEMA, Homeland Security Exercise Evaluation Program, [Homeland Security Exercise and Evaluation Program](https://www.fema.gov/hseep) | [FEMA.gov](https://www.fema.gov).

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expand the reach of the training provided to emergency responders, however, not much is known about the content of the training or the qualifications of those providing the instruction.



FIGURE 14: PHOTO CREDIT - BENDC/ISTOCKPHOTOS

Critical Questions and Considerations:

- A. How are the third-party vendors vetted and scheduled (by the railroads or the grantee)? What is the content of the various types of training provided?
- B. How do the railroads ensure the knowledge level of the vendor employee(s) conducting the training? What additional exposure do the railroads assume in using third-party vendors to conduct training on their behalf?
- C. How might training classes be audited for content and proper instruction?

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- D. What feedback mechanisms and other improvements and best practices should be considered?
- E. Are there any practical means to quantify third-party entities providing rail HAZMAT training, both on behalf of the railroads and as independent for-profit companies?



FIGURE 15: PHOTO CREDIT - THE SHORT LINE SAFETY INSTITUTE.

12. Prepositioning HAZMAT Response Equipment or Incident Support Teams:

The overall value and effectiveness of prepositioning HAZMAT response equipment has been debated for many years and is most typically performed by the railroads or environmental response contractors working on behalf of a railroad. Considerations include the type and purpose of the equipment, exact positioning of equipment and materials to minimize mobilization and arrival times to the incident site, upkeep and maintenance, cost, and actual case studies of the use of prepositioned HAZMAT response equipment. Similarly, there may be value

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in establishing incident support teams that can be deployed quickly to a major rail incident, fold into the established incident command structure, and become part of the incident unified command. A model supported by the U.S. Coast Guard exists in the maritime industry which utilizes qualified individuals in much the same manner.

Critical Questions and Considerations:

- A.** How can we evaluate the effectiveness of prepositioning HAZMAT response equipment and the degree to which it has improved or could improve the response to a HAZMAT incident?
- B.** What formula is used or should be used to establish the locations of prepositioned HAZMAT response equipment?
- C.** Is the network of environmental and HAZMAT response contractors utilized by the railroads such that their locations and on-hand equipment are in essence a de-facto prepositioning of equipment?
- D.** Are there examples of cross-functional, cross-organization incident support teams that have been training in rail HAZMAT-related incident response? If yes, how have they been utilized?
- E.** What is the role of the chemical shipper in providing specialized equipment for pre-positioning that may be needed to handle certain commodities?

13. Consideration of the Role of Community Emergency Coordinators and Planners:

The role of the emergency planner has become increasingly more important over the years since responses to major rail incidents typically include a whole community approach and require actions and support from law enforcement, local government and emergency

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management officials, medical services, public works, community leaders and service providers (such as child and elder care. Without training, members of these groups, while well intended, can introduce delays or other disruptions into the response process. In some cases, there may be a lack of understanding of the incident command structure. Of concern too, is whether emergency management officials are fully aware the information and training that railroads offer to emergency responders, or that the railroads make the same concerted efforts to inform and train the emergency management segment of the public sector as they do those in the fire service.



FIGURE 16: PHOTO CREDIT - ORANGE COUNTY FLORIDA GOVERNMENT, 09/07/2013.

At the site of a railroad incident involving hazardous materials, railroad managers and internal HAZMAT and environmental personnel work closely with the incident commander within the framework of the established incident command system. Most of the resources required to fully mitigate the incident, after the initial response by emergency responders, are provided by the railroads. These resources include HAZMAT and environmental response contractors, as well as other companies or internal personnel brought in to rerail and/or remove damaged rail cars and equipment and rebuild and repair the track. Some railroads will also

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respond quickly to bring in additional resources as necessary to assist in mitigating the situation or assist in the community's disaster response and recovery efforts.

Critical Questions and Considerations:

- A. Do emergency planners have different training needs and requirements than those of responders? If so, how should those categories be incorporated into the training provided by railroads?
- B. What rail incident information is considered most useful in developing a rail incident annex to a community's comprehensive emergency plan? How can that information be more consistently reflected in these community emergency plan annexes nationwide?
- C. What is the basic information that emergency planners need to develop an adequate rail emergency response and community standard of care component to their community's comprehensive plan?

14. Planning and Preparedness Information Available on Railroad Web Sites:

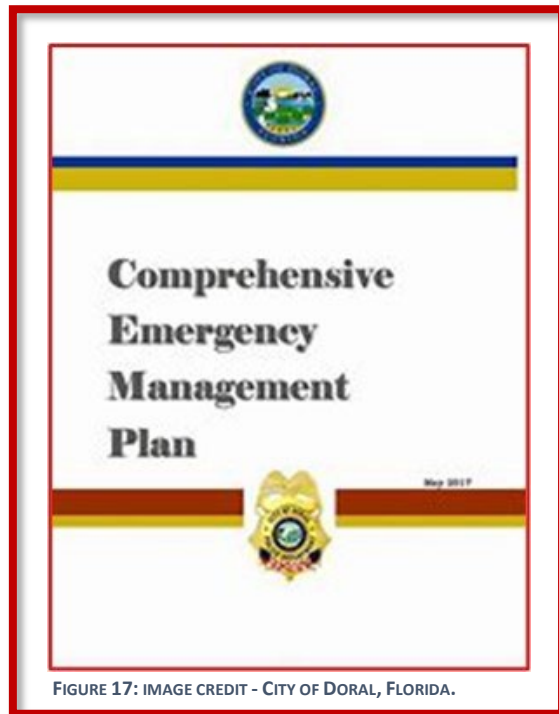
Most railroads provide useful safety and HAZMAT information on their company websites. For example, one single source useful site for access to this information is the AAR's website as follows: <https://www.aar.org/data/railroad-HAZMAT-resource-toolkit/>. This site also has links to other railroad-related HAZMAT response information. Individually, the railroads also provide various types of useful information for consumption by the general public as well as those in the emergency response community. In reviewing the sites specific to the railroads' focus on HAZMAT safety, there is a distinction between useful general public information and

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that information that can be used by emergency responders and community emergency planners to enhance their training or emergency planning responsibilities.

Critical Questions and Considerations:

- A.** What information on railroad websites is most useful to emergency first responders and community emergency planners?
- B.** How do railroads determine what emergency responder-specific information they post on their websites? Do they consult with emergency responders on website content?
- C.** Should the various railroads provide the same set of information at a minimum? What would be most important to include?
- D.** How is the volume of access to emergency responder sections of a railroad's web site monitored and measured?
- E.** How easy to navigate is the information on the website? Can it be made more navigable and user-friendly for emergency responders and emergency management personnel?
- F.** How does the information on the website differ from the information provided during training events?
- G.** Are railroad websites integrating operations security (OPSEC) into their information management processes?
- H.** Does having the information on publicly available sites pose a security risk? Or, is there some information that is not posted on railroad websites due to security concerns?



15. Community Assistance and Standard of Care Requirement:

Providing post incident assistance to the community is an important and sometimes overlooked aspect of the response to a railroad HAZMAT event that goes beyond the incident itself and directly to helping a community deal with the broader impact and aftermath of the incident. The broader question to be asked is whether railroads and/or chemical shippers should be required to develop and implement a post-incident community standard of care program that focuses specifically on assisting the affected residents of an impacted community. There are those among the contributors that believe the railroads do have a very clear responsibility (legal or not) to develop and implement such a plan in the critical aftermath of a serious HAZMAT incident.

Traditionally, after an incident, community care was the responsibility of the local emergency management coordinator and was an integral component of the community's

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emergency operations plan. Providing shelter and food for displaced residents, caring for special needs and disabled individuals, as well as addressing concerns for pets and livestock, are all typical components of a community operations strategy. However, the railroads have regularly assisted and augmented emergency planners and disaster relief organizations, such as the American Red Cross, The Salvation Army, and the National Voluntary Organizations Active in Disaster (VOAD), in handling community mass care and disaster assistance needs and concerns after a rail HAZMAT incident.

While there may be no formal requirements for railroads to provide this additional response assistance, there is empirical evidence of the value and benefit to the community and the railroad company, when it does. This may be especially true in the case of smaller communities with part-time or shared-responsibility emergency management officials that do not necessarily have the capacity or capabilities to adequately develop and maintain this component of the community's emergency plan.

Critical Questions and Considerations:

- A.** What are existing best practices in use related to a community standard of care following railroad HAZMAT incidents (industry, EPA, FEMA, DOE)?
- B.** What are the advantages and disadvantages for a railroad to have a community standard of care program to assist a community in addressing mass care and recovery needs? What would be the minimum requirements of such a program? How would it be implemented?
- C.** How and who would be responsible for providing necessary information in advance of an incident?

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- D.** How could such a program be scalable depending upon the railroad's available resources (e.g. short line vs. Class 1 railroad)?
- E.** In absence of voluntary action by the railroads, what best practices or voluntary standards from other sectors might be adopted and implemented?

16. Railroad Community Awareness and Emergency Planning Guides:

Most Class 1 railroads utilize and distribute community awareness and emergency planning guide documents to aid their training for emergency first responders, community emergency planners, and other public officials, and have done so for many years. The guides typically contain comprehensive information about the specific railroad, its operations, procedures for responding to a HAZMAT incident, information on other infrastructure unique to railroads, and other useful information to assist community emergency responders and emergency management officials.

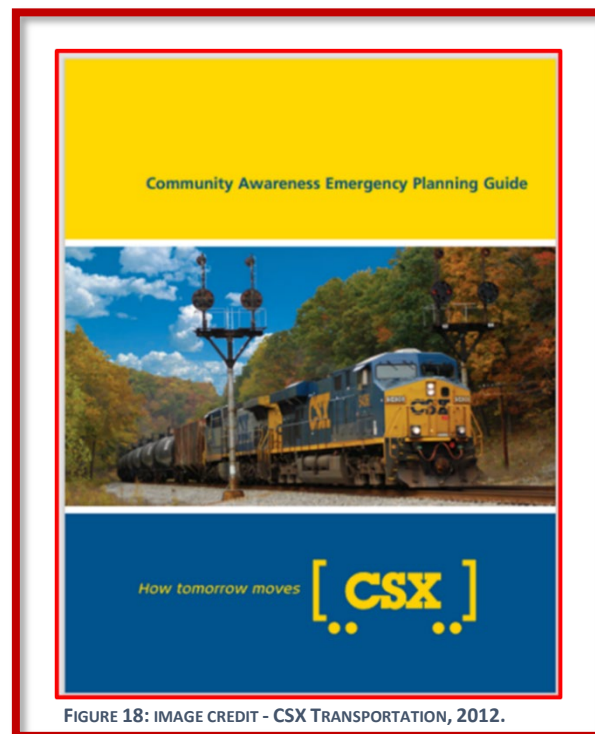


FIGURE 18: IMAGE CREDIT - CSX TRANSPORTATION, 2012.

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Critical Questions and Considerations:

- A.** How is guide content developed and updated? What degree of consistency (or conflicting information) is there in guide content between railroads? How could inconsistencies be resolved?
- B.** How are the guides distributed (mailed or available via the railroad website)? What is the best way to determine which method of distribution is most effective?
- C.** What is the frequency of updating the information in the guide and guide recipients?
- D.** How do community emergency planners and responders benefit from these guides, and how is the value of the document to the community evaluated/measured?
- E.** How do these guides synchronize or conflict with federal planning documents/outreach materials and guides developed by the response community? What processes are in place to foster appropriate deconfliction?
- F.** What information is provided to emergency managers and planners to identify the types and risks associated with HAZMATs transported by the railroads?

17. Transportation Emergency Response Plans (TERPS)

Rail yard specific Transportation Emergency Response Plans (TERPS) are also maintained by some railroads as are emergency response plans required by OSHA under 29 CFR 1910.38²⁰. The documents are prepared and maintained by the railroads and include detailed maps that identify the physical features of a railroad yard, the location of key physical infrastructure, emergency access routes, and roadways and close clearance points that can

²⁰ U.S. Department of Labor, Occupational Safety and Health Administration. www.osha.gov/laws-regs/regulations/standardnumber/1910/1910.39

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accommodate large emergency vehicles. Some TERPS also identify staging locations to take leaking cars and where containment materials are already in place. TERPS are considered to be especially useful for large freight terminals that stretch for miles and contain multiple yards (e.g. receiving, departure, classification) with a large number of individual tracks.

A notification page, often referred to as a red tab section of the plan, contains contact information for key personnel and government agencies and identifies sensitive receptors such as hospitals and schools within a one-mile radius of the yard. Depending on the railroad, the entire plan or just the red tab section is shared with local first responders. TERPS are also used by the railroads to conduct regular familiarization visits by emergency responders to better prepare them for an actual response to a rail yard.

Critical Questions and Considerations:

- A.** To what extent do all railroads utilize TERPS?
- B.** Is there value in developing some standardization in TERP content?
- C.** What are the sensitivities in providing the entire TERP vs. just the red tab section to local emergency responders or emergency planners?
- D.** What process is in place to update a TERP as needed?

PROCESS FOR EVALUATING QUESTIONS AND COMMENTS

To help identify the most critical aspects of rail-related training, preparedness, and community outreach programs discussed here, a set of criteria must be developed for measuring the importance of the considerations we have outlined above, and for establishing and measuring the relative “health” of railroad HAZMAT training, preparedness, and community outreach concerning each of those considerations. In this document, we discuss 17 topics and pose over

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110 critical questions. The contributors clearly understand that some of the answers to a number of the questions asked are already known. However, it is the value of those questions in driving a larger, more thought-provoking discussion, and perhaps debate, among thought leaders from across the spectrum of railroad, fire service, chemical shippers, and community emergency planners – one that should ultimately improve all facets of rail-related HAZMAT training and emergency planning and create better cross-sector coordination and collaboration.

As a starting point, it is suggested that each of the topics discussed in this document be evaluated and measured on the six following criteria, or at least those that apply: Essentiality, quality, consistency, effectiveness, reach, sustainability. A basic numeric (1-3-5) or descriptive word (low-adequate-high) scoring system could also be implemented to help prioritize the level of need and importance, as well as more clearly identify those areas in need of additional improvements.

EVALUATION CRITERIA

1. **ESSENTIALITY** – How essential is the activity or information to emergency responders and/or community emergency planners?
2. **QUALITY** – Is the overall quality, content, and method of delivering the material consistent and/or adequate?
3. **CONSISTENCY** – Are the same and similar activities consistent in the content and manner in which they are provided?
4. **EFFECTIVENESS** – Is trainee or user engagement, comprehension, and retention adequate?
5. **REACH** – Does the activity or availability of information adequately reach all intended audiences on a regular or ongoing basis?
6. **SUSTAINABILITY** – Can the activity be maintained, evaluated, and improved as necessary? Is there long-term support for the activity or information?

SECTION 4.

RECOMMENDED NEXT STEPS

As identified earlier in this document, this is intended to be the first of what should be several additional steps to evaluate fully and accurately each of the topics identified and answer in adequate detail each of the questions posed. At least among the collective opinion of the panel of contributors, there is adequate need and justification to pursue a more comprehensive study of the topics and questions raised in this paper.

While several next steps can be pursued to adequately socialize and inform other interested parties and individuals of this work, the goal of each successive step must be to engage the right people in the most appropriate collaborative setting on the correct topics. It must also clearly define the universe of rail-related HAZMAT training, preparedness, and community outreach programs, and correctly evaluate, and where necessary improve, their essentiality, quality, consistency, effectiveness, reach, and sustainability.

The contributors to this document suggest that efforts should focus on convening a working conference attended by thought leaders from across the spectrum of rail HAZMAT training, preparedness, and community outreach activities, as well as stakeholder groups affected by rail HAZMAT operations and safety. Properly constructed and facilitated, the results of such an assembly would effectively evaluate and record the opinions and consensus on the most critical topics facing rail related HAZMAT training, preparedness, and community outreach. The information below outlines possible considerations and structure for such an event.

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FIGURE 19: PHOTO CREDIT - PORT HURON TIMES HERALD.

CONFERENCE OF RAILROAD HAZMAT THOUGHT LEADERS

Intended Purpose

The logical next step recommended by the panel of contributors would allow for a more formal vetting and evaluation of this document employing a conference of railroad HAZMAT thought leaders (CRHTL). This group would gather to engage in relevant discussions regarding the current state of HAZMAT-related training, preparedness, and community outreach provided to the nation's emergency first responders and emergency managers.

The CRHTL would be organized to provide a neutral and non-aligned forum in which to discuss and evaluate the viability of the many forms of training, planning, and outreach made available to emergency first responders today.

The CRHTL would bring together knowledgeable and experienced individuals from many associated sectors including:

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- Freight railroads
- Chemical manufacturers and shippers
- Railroad and chemical manufacturer trade associations
- Fire, police, and EMS agencies
- Fire and police member associations
- National HAZMAT Roundtable stakeholders
- Emergency planning officials
- Federal regulatory agencies and safety boards
- HAZMAT training centers
- Academia and research organizations
- HAZMAT and environmental response companies
- Town/city/ county public officials
- Others as deemed necessary

It is anticipated that such an event would garner significant interest. To obtain an appropriate number and balance of thought leaders from across the various sectors, while remaining a manageable number to ensure optimum individual participation, it is recommended that the maximum number of participants be set at approximately one hundred, not including guests and speakers.

Steering Committee

Creating an energetic and diverse planning committee willing to engage in many of the actual event planning details is a necessity if the CRHTL is to be successful. It is suggested that the steering committee be comprised of eight to ten dependable and respected members (a few more are fine) who represent the major sectors of participants, and who can dedicate the necessary time to ensure that the event can be carried out effectively and is seen by the vast

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majority of attendees as being worthy of their time and participation (and worthy of repeating regularly).

The planning committee would be responsible for many essential items including but not limited to:

- Agreement on an agenda
- Agreement on suggested participants and method of invitation and selection
- Success in locating funding sponsors if necessary
- Identifying suitable guest speakers
- Identifying and engaging suitable program moderator(s) and breakout session moderators
- Identifying discussion panel participants
- Selection of event city location and event property
- Dates of the event

Some, if not all, of the steering committee members could also form the nucleus of a larger standing advisory committee described later in this section.

Sponsorship, Cost, and Funding

The CRHTL would be free to participants, including meals. Participants would be responsible for their travel and accommodations. It is estimated that a three-day event for one hundred participants, including continental breakfast, snacks, buffet lunch, handout materials, etc., would be estimated at between \$75,000.00 to \$100,000.00.

Funding for the CRHTL would possibly come from a government grant program sponsor, or private contributors (companies) that would be recognized before and during the event as sponsors. Other opportunities, such as hosting a night-before welcome reception, and/or setting up information tables are other possibilities. Possible sponsors include:

- Chemical shippers and distributors
- Environmental and HAZMAT response companies

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- Rail suppliers and rail car builders
- Railroads
- Trade associations
- Federal regulatory agencies

Commitment to all necessary funding to cover the event would be required before proceeding with any further planning.

Guest Speakers

The CRHTL would include several guest speakers, ideally well-known and well-respected by the majority of participants and who could provide remarks that underscore the importance of the event and coming together from many sectors to evaluate the current state of railroad HAZMAT training, preparedness, and outreach. Comments should focus on the importance of working together toward a common goal.



FIGURE 20: PHOTO CREDIT – FDIC INTERNATIONAL.

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Moderator

Similar to the guest speakers, the event moderator(s) should be someone generally known to the participants, who is engaging, and who can adequately manage the event agenda.

Depending on future determinations regarding the structure of the conference, it may be advisable to incorporate more than a single moderator.

Breakout Session Facilitators and Panel Discussion Participants:

Breakout session facilitators should be familiar with and have a genuine interest in the topic. They should be able to clearly state the objective of the session, stimulate a meaningful discussion, and adequately manage the time. It would be helpful if each facilitator had someone taking notes. To save time, it is intended that each facilitator would deliver the finding and/or consensus of their breakout session.

Several panel discussions should also be included in the event. It is suggested that the panels be comprised of a facilitator, and four or five panel members representing the different sectors participating in the event (e.g. railroads, shippers, fire service, emergency planners, and regulatory agencies). The panel discussion should involve a series of pre-prepared questions asked by the facilitator and questions from the participants (audio visual equipment needed). The combination of both pre-prepared and participant questions should be such as to take up the allotted time frame.

Conference Timing

There needs to be a real sense of urgency to conduct and complete the steps leading up to the actual scheduling of this conference. The contributors fully believe that the facts and concerns they raise in this document, and the questions they pose cannot remain idle or go unanswered.

There is too much misinformation and misunderstanding of the relationship that exists between

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the emergency response community and the railroads. And, while there is work to be done to improve upon this relationship and to more fully understand the depth and breadth of the overall effectiveness and value that the training and preparedness information offered by the freight rail industry for many years has had.



FIGURE 21: PHOTO CREDIT - ROBERT BURKE, FIREHOUSE, 02/01/2019.

NEED FOR PERIODIC REVIEW OF TOPICS PRESENTED IN THIS DOCUMENT

While the intended outcome of the assembly described above will provide valuable enhancements and improved consistency with many aspects of rail-related HAZMAT training, preparedness and community outreach, it cannot be the final initiative if the topics and considerations offered in this document and improvements identified during the conference are to be implemented and monitored regularly to ensure their overall efficacy and sustainability. Accordingly, the panel of contributors recommends that PHMSA, in coordination with other key stakeholders, take the lead on identifying a format for providing a comprehensive cross-sector review process that will provide the means to review and evaluate key elements of the HAZMAT

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training, preparedness, and community outreach topics presented in this document, and to identify any existing gaps and possible opportunities for new programs.

The main objective of such an essential process would be to allow the primary offerors of rail-related HAZMAT training and community emergency planning information to receive constructive feedback and suggestions from the primary receivers of the training and information being provided. Such a process should also serve as a means for offerors to discuss and coordinate their activities and share lessons-learned and best practices amongst themselves. For receivers of this important training and information, it can afford an opportunity to discuss ways to further improve the effectiveness and reach of the training and information being offered.

PHMSA should seek broad input and evaluate the advantages and disadvantages of the recommendations and considerations provided by the stakeholders in order to create the most collaborative, beneficial, productive, and sustainable review and assessment process possible. The overall coordination and responsibility for overseeing this process should reside with the most logical organization (or organizations if shared responsibility) as determined by PHMSA in consultation and agreement with key stakeholders representing the railroads, fire service, law enforcement, emergency management agencies, the chemical industry, and other affected groups. Ideally, the topics should be reviewed at least every two years, or more frequently if necessary. If necessary, this process review initiative could also logically take the place of the larger thought leaders conference suggested above if the larger assembly is not considered feasible. Although there are groups in place today representing several different transportation modes that work together in providing HAZMAT training for emergency responders, we know of no such group that exists to ensure adequate representation, coordination, communication, effectiveness, and regular review of all the topics identified in this document.

CONCLUSION

The contributors would like to thank our many friends and colleagues from across the spectrum of industry, government, fire, and emergency management services, who we have worked with and learned so much from. Whether it was at conferences, association meetings, training events, regulatory negotiations, or derailment sites, we always maintained the common goal of improving the safe transportation of hazardous materials. The many stories, laughs, and tough discussions we shared allowed us to learn from, respect, and appreciate each other's points of view and opinions. Together, we grew a great collegiality that exists today.

To those who will read this document, and to those who will take on the responsibility of pursuing the further direction this document demands, it is our sincere hope that you will approach it with an open mind – just as we did when writing this document. Your collective knowledge, experience, and dedication to improving HAZMAT safety will serve you well as you work to establish an even stronger foundation of railroad-related HAZMAT training, preparedness, and community outreach programs. Our accomplishments are greater when we set aside our natural biases, remain fact-based, and work as a team, not as individuals. We ask that you do the same.

It is also important to state that no compensation of any type was received by any of the contributors or members of the review team for their work on this document. The significant amount of time and talent devoted to this important work by this experienced cross-sector group was provided without hesitation and is attributed to their ongoing dedication and commitment to improving all aspects of rail-related HAZMAT transportation safety.

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The railroad industry, chemical and petrochemical industry, national fire service, law enforcement, emergency management officials, and federal regulatory agencies have a long history of working together to ensure that emergency responders are adequately trained and prepared to handle a wide variety of rail related incidents. While the frequency of serious railroad derailments involving the releases of hazardous materials and their impacts on communities and the environment continue to diminish, they still do happen. And because the location, date, time, and types of hazardous materials involved in the next HAZMAT derailment will always be unknown, it is essential that all those involved in preparing, offering, and receiving rail-related HAZMAT training, preparedness, and community outreach programs, continue to pursue their good work and accepting and providing the required additional evaluation to the topics and questions presented here.



FIGURE 22: PHOTO CREDIT - HRE INTEGRITY LLC.