RAILROAD SAFETY

AND

SECURITY

TASK FORCE

INITIAL REPORT AND RECOMMENDATIONS

MAY 1, 2015

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TABLE OF CONTENTS

ABSTRACT

After the April 30, 2014, derailment and fire, in downtown Lynchburg, of a 105-car CSX unit train hauling crude oil from the Bakken shale formation to a terminal in York County, Governor Terry McAuliffe established the Virginia Railroad Safety and Security Task Force. The Task Force is co-chaired by Secretary of Transportation Aubrey Layne and Secretary of Public Safety and Homeland Security Brian Moran. Comprised of state officials from agencies with various responsibilities for rail safety and security, the Task Force has conducted four public meetings with participation from local, state, and federal agencies, environmental groups, railroads, industry experts, news media, and other stakeholders. The focus of this initial report is on rail transportation of flammable liquids, particularly crude oil and ethanol. However, the majority of the Task Force's recommendations are broadly applicable to overall railroad safety and security in Virginia.

EXECUTIVE SUMMARY

Virginia's considerable railroad infrastructure and five key transportation nodes provide strategic economic opportunities to communities and businesses across the state. The safety of residents and visitors, however, is always paramount. On May 9, 2014, Virginia Governor Terry McAuliffe formed the Commonwealth's Railroad Safety and Security Task Force ("Task Force") to engage the necessary agencies and stakeholders responsible for addressing the risks of transporting crude oil and other hazardous materials by rail. The Task Force's collaboration has produced a series of actions and recommendations for government agencies and industry to help prevent, prepare for, respond to, and recover from potential rail-related incidents.

Given the overall frequency and volume of commodities, including hazardous materials of every type, shipped by railroads throughout Virginia each day without incident, it seems clear that rail transportation is generally a safe, efficient, and reliable method for moving freight and passengers. Still, the spate of recent derailments and fires involving Bakken crude oil and other flammable liquids, such as ethanol, across North America is a cause for concern.

This concern is reinforced by federal studies attempting to quantify the risks posed by rail transport of crude oil and ethanol. Without further action to improve the safety of these shipments, research by the U.S. Department of Transportation (USDOT) concludes:

> The analysis shows that expected damages based on the historical safety record could be $4.5 billion and damages from higher-consequence events could reach $14 billion over a 20-year period in the absence of the rule.[1]

In the United States, promulgation and enforcement of rail safety and security regulations is generally reserved to the federal government under the Commerce Clause (Article 1, Section 8, Clause 3) of the U.S. Constitution. The vast majority of these regulations are described in Title 49 of the Code of Federal Regulations (CFR). While states are, in some cases, delegated authority to enforce specific rail and hazardous materials safety regulations on behalf of their federal agency counterparts, the development and codification of these regulations is primarily accomplished through the federal rulemaking process.

Given this fact, the Task Force appreciates the continued attention paid to rail safety and security issues by Senator Mark Warner and Senator Tim Kaine who have, as recently as

[1] U.S. Department of Transportation (2014) Pipeline and Hazardous Materials Safety Administration. *Hazardous Materials: Enhanced Tank Car Standards and Operational Controls for High-Hazard Flammable Trains; Regulatory Impact Analysis for Notice of Proposed Rulemaking.* July 2014. Washington, DC. 10

April 30, 2015,[2] called for the appropriation of additional federal funds to help address the hazards posed by crude oil trains, along with timely completion of the federal rulemaking process to codify a number of identified opportunities for improving product characterization, tank car design, and overall rail system safety. [3] [4] The Task Force hopes that Virginia's delegation, and other interested members of Congress, will continue addressing states' salient rail safety and security concerns.

The Task Force also looks forward to the expected release of the National Transportation Safety Board (NTSB) report on the April 30, 2014, derailment of a 105-car CSX unit train carrying Bakken crude oil through the City of Lynchburg. While the joint local, state, federal, and private sector response to that incident exemplifies Virginia's readiness and capability to address the hazards posed by crude oil and other commodities, it is also apparent that the impacts on life, property, and the environment could have been more severe. The Task Force has benefited greatly from the NTSB's interim recommendations[5] [6] [7] and hopes the agency will continue to investigate and report on incidents involving high-hazard flammable trains (HHFTs) in a timely fashion.

The Task Force appreciates the continued engagement and outreach provided by the federal Pipeline and Hazardous Materials Safety Administration (PHMSA) within the U.S. Department of Transportation (USDOT). Acting PHMSA Administrator Timothy Butters provided a briefing to the Task Force during its August 20, 2014, meeting in Lynchburg and PHMSA has routinely provided useful information and insight in the wake of several other train derailments across the United States and Canada. The Task Force urges PHMSA to aggressively develop and promulgate the additional regulations contemplated in its August

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[2] Wyden, Warner, Kaine, et al. (2015) *Hazardous Materials Rail Transportation Safety Improvement Act of 2015*. April 30, 2015. 114th Congress. Washington, DC.
http://www.warner.senate.gov/public/index.cfm/pressreleases

[3] Warner, Kaine, et al. (2015) *Letter to Senator Collins and Senator Reed*. March 23, 2015.
http://www.warner.senate.gov/public/index.cfm/pressreleases

[4] Warner and Kaine (2015) *Letter to Administrator Howard Shelanski, Office of Information and Regulatory Affairs, Office of Management and Budget*. February 20, 2015.
http://www.warner.senate.gov/public/index.cfm/pressreleases

[5] National Transportation Safety Board. (2012) *Safety Recommendation Letters: R-12-5 through -8 and R-07-4 (reiteration)*. March 2, 2012. Washington, DC.

[6] National Transportation Safety Board. (2014) *Safety Recommendation Letters: R-14-001-003 and R-14-004-006. January 23, 2014*. Washington, DC.

[7] National Transportation Safety Board. (2015) *Safety Recommendation Letters: R-15-14 through -17. April 3, 2015*. Washington, DC.

2014 Notice of Proposed Rulemaking (NPRM) [8] and Advanced Notice of Proposed Rulemaking (ANPRM).[9]

Given the constitutional limitations on state governments to address the root causes of rail emergencies, the Task Force's efforts were necessarily focused on opportunities to enhance response and recovery, with some limited prevention and safety-related activities conducted within the authorities delegated to the State Corporation Commission (SCC) by the Federal Railroad Administration (FRA).

From its inception, Governor McAuliffe charged the Task Force with taking immediate action whenever possible, and not waiting for a report to move forward on identified enhancements. To this end, a number of actions have already been taken by several state agencies, in concert with federal and other partners:

- Increased SCC inspection frequency of the currently identified crude oil shipping route
- Increased investment in Virginia Department of Fire Programs (VDFP) foam firefighting trailers located across the Commonwealth
- Joint Virginia Department of Emergency Management (VDEM)/CSX training for localities along the currently identified crude oil shipping route
- Increased VDEM, VDFP, and local first responder training with CSX, Norfolk Southern, and TRANSCAER®[10]
- Continuous engagement with USDOT/PHMSA
- Public information sharing on VDEM website[11]
- Regular interaction with Virginia's congressional delegation

While there remains some disagreement about the relative contributions of various factors to the consequences of derailments involving shale crude oil, for state and local responders the scientific nuances are merely interesting. It seems clear from recent events that derailments, even at relatively low speeds, of unit trains hauling crude oil or other bulk flammable liquids are major emergencies and will require a commitment of resources well beyond the capacity of most localities in the Commonwealth.

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[8] U.S. Department of Transportation (2014) Pipeline and Hazardous Materials Safety Administration. *Hazardous Materials: Enhanced Tank Car Standards and Operational Controls for High-Hazard Flammable Trains*. Notice of Proposed Rulemaking. August 1, 2014. Washington, DC.

[9] U.S. Department of Transportation (2014) Pipeline and Hazardous Materials Safety Administration. *Hazardous Materials: Oil Spill Response Plans for High-Hazard Flammable Trains*. Advanced Notice of Proposed Rulemaking. August 1, 2014. Washington, DC.

[10] Transportation Community Awareness and Emergency Response. http://www.transcaer.com/

[11] http://www.vaemergency.gov/em-community/hazmat/resources

Responding to, and recovering from, a rail incident where hazardous materials are involved is inherently a team effort. By necessity, local, state, and federal agencies, the railroads and their contractors, and other partner organizations will be required to work together for days, weeks, and even months at a time. The state agencies comprising the Task Force have a long history of collaboration with each other, and their response partners, during all phases of the emergency management cycle. The relationships that underpin this cooperation are perishable, however, and continual work must be done to promote collaborative training, exercises, and the development and maintenance of operating practices that meet all agencies' dynamic needs.

The degree to which Virginia first responders can safely and effectively address a major rail incident is directly related to their baseline capabilities for addressing emergencies arising from all hazards. Regardless of the specific cause, a major fire, mass casualty incident, and/or security situation will be handled by local and state first responders during the critical first minutes and hours following an event. To the extent these responders have unmet needs—for baseline training, staffing, vehicles, and equipment—their response to, and recovery from, an extraordinary incident will also suffer.

Similarly, the capability to respond to, and recover from, a major hazardous materials spill or release is costly to develop and maintain. While the Commonwealth has historically provided support to selected local fire departments to help maintain a hazardous materials ("HAZMAT") response capacity in eight regions across the state, the level of state support has diminished through the years and localities are generally providing the majority of the funding to support the state's core HAZMAT response capability.

The goal of Virginia's Railroad Safety and Security Task Force is to complete an in-depth review of current agency and partner actions, programs, and opportunities to ensure that, within the scope afforded to states by federal regulations, Virginia is doing everything possible to provide a safe and effective response and recovery to a rail safety or security incident. While the focus of this report is on rail transport of hazardous materials, especially crude oil and ethanol, we anticipate continued efforts by the Task Force to identify and address the overall safety and security of Virginia's rail system.

KEY FINDINGS

- Considering the overall volume and diversity of cargo transiting daily, without incident, along Virginia's railroad lines, rail transportation remains a relatively safe method of moving hazardous materials.
- Virginia has a robust, integrated, and longstanding system to plan for, respond to, and recover from hazardous materials emergencies along rail lines and in other locations across the Commonwealth.
- The upward trends in crude oil and ethanol shipments are expected to continue across North America and Virginians are rightly concerned, based on recent experience and current research, about the safety of these products during rail transport.
- Rail transportation has been legally defined as interstate commerce and the vast majority of safety and security regulations are both promulgated and enforced by federal agencies.
- Beyond some limited authorities for railroad inspection that are delegated to the SCC by the FRA, local and state governments' roles in rail safety and security are generally confined to preparing for, responding to, and recovering from emergency incidents along privately-owned railroad rights-of-way.
- Local and state response agencies across the Commonwealth enjoy longstanding working relationships with Virginia's railroad companies, as demonstrated by multiple joint training activities, incident responses, grant funding opportunities, information sharing, and equipment donations.
- Virginia state agencies have positive relationships with the federal agencies responsible for various aspects of rail safety and security in the Commonwealth.
- While Virginia has a solid foundation to help address the impacts of a rail incident, there are a number of potential opportunities, given additional funding, to enhance responders' operational capabilities.
- Given the constitutional restrictions on state regulation of interstate commerce, there are limited opportunities for state-level legislation to enhance rail safety and security beyond the creation of additional funding streams for planning, response, and recovery programs.
- More specific information on railroad-related infrastructure, train locations and consists, and detailed hazardous materials response plans should be readily available to local and state response agencies for planning, response, and recovery. However, this type of information could be used for nefarious purposes and must be protected to help ensure the safety and security of both rail corridors and cargoes across Virginia.

BACKGROUND & OBJECTIVES

BACKGROUND

Virginia Governor Terry McAuliffe initiated the Railroad Safety and Security Task Force after the derailment of a CSX freight train carrying crude oil shipped from the Midwest to a terminal in York County, Virginia. The incident, which resulted in a fire and contamination of the James River by spilled crude oil, occurred in downtown Lynchburg, Virginia.

> The train derailment that occurred on April 30th raises important public safety and health concerns. While fortunately no one was hurt, it is critical that we determine the cause of this accident to help better protect Virginia's families. The Task Force will help ensure that the Commonwealth is a national leader in preventing, preparing for, and responding to these types of events.[12]

In an effort to ensure collaboration with federal partners, Governor McAuliffe sent a letter to United States Secretary of Transportation Anthony Foxx relaying his support and eagerness to strengthen federal regulations regarding the safety of rail cars carrying crude oil, as well as improving communication between railroads, first responders, and community officials.

Furthermore, Governor McAuliffe directed the Task Force, while not technically a public body per the Code of Virginia ("Code"), to conduct its meetings and deliberations in full view of relevant stakeholders and citizens. The Task Force conducted four meetings with robust participation from local, state, and federal agencies, environmental groups, railroads, industry experts, news media, and representatives from other interested organizations.

- Richmond—June 4, 2014
- Lynchburg—August 20, 2014
- Norfolk—October 24, 2014
- Richmond—April 9, 2015

The Task Force didn't just look at rail safety and security while in-transit, but also received briefings from representatives of the Plains ("Plains") All American Pipeline tank farm and transloading facility in York County, along with staff from the United States Coast Guard (USCG) responsible for addressing the potential marine impacts of a crude oil spill while the product is transloaded onto barges for ultimate delivery to refineries along the East Coast.

[12] McAuliffe, T. (2014) *Governor McAuliffe Announces Railroad Safety and Security Task Force.* May 9, 2014. https://governor.virginia.gov/newsroom/newsarticle?articleId=4801

OBJECTIVES

The Railroad Safety and Security Task Force is charged with making recommendations and taking appropriate actions to bolster the Commonwealth's capacity to protect lives, property, and the environment along Virginia's many rail lines. The Task Force was given three main objectives: 1) solicit input from industry stakeholders, local governments, and members of the public regarding the threats and vulnerabilities of transporting products such as crude oil and ethanol by rail; 2) identify opportunities to address the negative consequences of a large-scale rail incident; and 3) strengthen relationships and communication channels between the various entities involved in preventing, responding to, and recovering from a rail-related emergency.

Governor Terry McAuliffe established the Task Force to take a comprehensive approach to balancing the health and wellness of Virginia's communities with the extensive history of rail service in the Commonwealth, following many high-profile incidents involving the transportation of crude oil. This report summarizes thousands of pages, which were gathered from subject matter experts, state officials, federal agencies, public input, and industry specialists.

The report lays a foundation through a brief discussion of some current issues surrounding rail transport of flammable liquids, and by outlining the objectives of the Task Force. A snapshot of Virginia's expansive railroad network follows an introduction to materials of concern, including crude oil and ethanol. Some recurring considerations for prevention, response, and information sharing are summarized before describing the roles of seven key state agencies to provide background for the recommendations that follow.

The Task Force's recommendations are described in nine sections:

A. Prevention
B. Planning
C. Response
D. Information Sharing
E. Training
F. Exercises
G. Equipment
H. Funding
I. Regulatory and Legislative

While the focus of this report is on rail transport of hazardous materials, especially crude oil and ethanol, we anticipate continued efforts by the Task Force to identify and address the overall safety and security of Virginia's rail system.

CURRENT ISSUES

When considering rail safety and security issues, it is important to place the risk of a major derailment, and subsequent fire or hazardous materials release, in context. Despite a spate of recent derailments in locations across North America, the overall probability of such an incident remains relatively low compared to other types of transportation-related emergencies. The probability of life loss and significant property or environmental damage is lower still, but the sheer quantities of the materials involved, along with the many unanswered questions about how the physical and chemical properties of crude oil affect fire dynamics in the event of a derailment, warrant continued attention.

In reviewing the evolving literature on hazardous materials incidents arising from the rail transportation of Bakken crude oil, the Task Force noted a tendency to focus on the characteristics of individual rail (tank) cars versus potential improvements to the safety and security of the overall rail transportation system. It is notable that even the improved DOT 111 Casualty Prevention Circular 1232 (CPC-1232) railcars that are currently preferred for the transportation of shale oil have ruptured and released product that ignited when they were subjected to the physical forces of a derailment, even at relatively low speeds. It seems clear that the complexity of the overall system for transporting crude oil, and other commodities, demands a systems thinking approach to describing the multi-dimensional aspects of the problem and potential solutions.

The Pipeline and Hazardous Materials Safety Administration (PHMSA) within USDOT has issued a Notice of Proposed Rulemaking (NPRM) [13] and Advanced Notice of Proposed Rulemaking (ANPRM) [14] signaling its intention to enhance classification standards, hazard categorization, preparedness planning, and rail system safety related specifically to high-hazard flammable trains (HHFTs) transporting large volumes of crude oil and ethanol. Requirements in the proposed rule address: rail routing restrictions; tank car integrity; speed restrictions; braking systems; proper classification and characterization of mined liquid and gas; and notification to State Emergency Response Commissions (SERCs). [15]

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[13] U.S. Department of Transportation (2014) Pipeline and Hazardous Materials Safety Administration. *Hazardous Materials: Enhanced Tank Car Standards and Operational Controls for High-Hazard Flammable Trains*. Notice of Proposed Rulemaking. August 1, 2014. Washington, DC.

[14] U.S. Department of Transportation (2014) Pipeline and Hazardous Materials Safety Administration. *Hazardous Materials: Oil Spill Response Plans for High-Hazard Flammable Trains*. Advanced Notice of Proposed Rulemaking. August 1, 2014. Washington, DC.

[15] U.S. Department of Transportation (2014) Pipeline and Hazardous Materials Safety Administration. *Hazardous Materials: Enhanced Tank Car Standards and Operational Controls for High-Hazard Flammable Trains; Regulatory Impact Analysis for Notice of Proposed Rulemaking*. July 2014. Washington, DC. 2

This rulemaking process is not yet complete, but anticipation is mounting for timely federal regulatory action given the most recent Bakken crude oil derailment and fire in Mount Carbon, West Virginia on February 16, 2015;[16] and subsequent recommendations sent by the National Transportation Safety Board (NTSB) to PHMSA on April 6, 2015.[17]

MATERIALS OF CONCERN

Although a wide range of hazardous materials are routinely transported by rail and regulated by USDOT under Code of Federal Regulations (CFR) Title 49, of particular concern at present are crude oil and ethanol.

> Transportation of flammable liquids poses safety and environmental risks. The risk of flammability is compounded in the context of rail transportation because petroleum crude oil and ethanol are commonly shipped in large unit trains.[18]

CRUDE OIL

Within the last decade, the United States has dramatically increased its ability to access, extract, and refine domestic crude oil.[19] Since 2005, U.S. crude oil production has nearly doubled; from about five million barrels per day, to a projected nine million barrels per day by the end of 2015.[20] The most concerning type of crude oil is found in the Bakken shale formation located in North Dakota and eastern Montana.[21] The elevated concern is due to the higher volatility of the Bakken crude as compared with other crude oil samples.[22] This makes Bakken crude oil more flammable than traditional heavy crude oil, which has forced the entire rail industry to reexamine

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16 National Transportation Safety Board (2015) *NTSB Gathering Information on CSX Crude Oil Train Derailment in West Virginia*. February 17, 2015. http://www.ntsb.gov/news/press-releases/Pages/PR20150217.aspx

17 National Transportation Safety Board. (2015) *Safety Recommendation Letters: R-15-14 through -17*. April 3, 2015. Washington, DC.

18 U.S. Department of Transportation (2014) Pipeline and Hazardous Materials Safety Administration. *Hazardous Materials: Enhanced Tank Car Standards and Operational Controls for High-Hazard Flammable Trains; Regulatory Impact Analysis for Notice of Proposed Rulemaking*. July 2014. Washington, DC.

19 Association of American Railroads (2015) *Crude Oil By Rail*. https://www.aar.org/safety/Pages/crude-by-rail-facts.aspx - .U34OCfldV8E

20 Association of American Railroads (2015) *U.S. Crude Oil Production*. https://www.aar.org/Pages/U.S.-Crude-Oil-Production.aspx

21 Keane, A.G. and Drajem, M. (2014) *Bakken Crude More Dangerous to Ship Than Other Oil.* Bloomberg Business. January 2, 2014. http://www.bloomberg.com/news/articles/2014-01-02/bakken-crude-more-dangerous-to-ship-than-other-oil-u-s-.

22 *Id.*

its approach to safely transporting Bakken crude.[23] Under CFR Title 49, crude oil was previously considered a packing group III hazard based on its chemical composition, but due to Bakken crude's unique characteristics and the impact of recent train derailments, the USDOT issued an emergency order requiring crude oil to be tested, categorized, and transported as either a packing group I or II hazard.[24]

A March 2015 study by Sandia National Laboratories[25] lends weight to concerns raised by industry and first responders about the uncertainties posed by crude oil sourced from the Bakken shale formation and the resulting potential for negative consequences if incidents occur during rail transportation.

> Relationships between crude oil properties and probability or severity of combustion events in rail car spill scenarios have not been established. Although it is likely that a combination of crude oil properties—especially those associated with potential for flammable vapor formation—could be used to predict combustibility, no specific, objective data were found that correlated known crude oil properties with the likelihood or severity of rail transport-related combustion events. While industry groups actively working on this problem have been identified, their progress and results have not yet been released to the public.[26]

ETHANOL

Although Bakken crude oil has captured public attention in recent months, ethanol is another flammable liquid that is often transported by rail in bulk quantities with a similar fire and explosion potential if involved in a large-scale rail incident. Ethanol is a denatured alcohol biofuel created by using corn, which is widely used as a gasoline additive.[27] Ethanol is unable to be transported through existing pipeline networks due to its tendency to destroy the pipeline seals.

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[23] Pipeline and Hazardous Materials Safety Administration (2015) *Operation Safe Delivery: A Comprehensive Federal Action Plan To Address The Safe Transportation Of Crude Oil And Other Flammable Liquids.* http://www.phmsa.dot.gov/hazmat/osd/operation-safe-delivery-update

[24] United States Department of Transportation (2014) *Emergency Order, Docket No. DOT-OST-2014-0025.* March 6, 2014. http://www.dot.gov/briefing-room/dot-issues-emergency-order-requiring-stricter-standards-transport-crude-oil-rail.

[25] Sandia National Laboratories (2015) *Literature Survey of Crude Oil Properties Relevant to Handling and Fire Safety in Transport*. DOE/DOT Tight Crude Oil Flammability and Transportation Spill Safety Project. Report# SAND2015-1823. March 2015. Albuquerque, NM.

[26] *Id., 12*

[27] U.S. Department of Agriculture (2007) *Ethanol Backgrounder*. September 2007. Washington, DC. http://www.ams.usda.gov/AMSv1.0/getfile?dDocName=STELPRDC5063605.

As an alternative to pipelines, the vast majority of ethanol is transported by rail from the Midwest to mixing stations near the coasts where it is mixed with gasoline at a final ratio of usually 15% ethanol to 85% gasoline.[28] Denatured ethanol (i.e., mixed with 5% gasoline) is shipped in bulk quantities on rail lines throughout Virginia and fixed facilities for production, mixing, and transloading ethanol are located in several communities across the Commonwealth. The anticipated federal regulations for transporting Bakken crude oil will also be applicable to ethanol during rail shipment in large quantities.

VIRGINIA RAILROADS

The Commonwealth of Virginia contains a significant railroad infrastructure consisting of:

- Two "Class 1" railroads – Norfolk Southern (NS) and CSX[29]
- Nine "Class 3" railroads, often referred to as "shortlines"[30]
- Twelve different railroad companies operating within the Commonwealth[31]
- Two passenger rail systems – Amtrak and VRE[32]
- Over 3,400 route miles, most of which are operated by NS and CSX[33]
- Five "key nodes" located in Norfolk, Richmond, Lynchburg, Roanoke, and Alexandria[34]
- Over 5,775 highway/railroad crossings[35]
- 1,865 public crossings, and over 2,751 known private crossings[36]
- Yorktown terminal, with a 6 million barrel storage capacity, that can unload two crude oil trains per day, and load one crude oil barge per day[37]

The federal government has ultimate authority for rail safety under the Federal Railroad Administration (FRA), which is an agency of the United States Department of Transportation (USDOT). Federal legislation preempts state authority to regulate or restrict railroads, which the

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[28] Environmental Protection Agency (2015) *Biofuel Ethanol Transportation Risk*. Science Brief. http://nepis.epa.gov/Exe/ZyPDF.cgi?Dockey=P100E4QX.txt

[29] Virginia Department of Rail and Public Transportation (2013) *2013 Virginia Statewide Rail Plan*. Commonwealth of Virginia. Richmond, VA. 31

[30] *Id.*

[31] *See infra*.

[32] *Id.*

[33] *Id.*

[34] *Id.*

[35] Virginia Department of Transportation (2014) *Highway/Rail Safety Improvement Program*. Presentation to Railroad Safety and Security Task Force. June 4, 2014. Richmond, VA.

[36] *Id.*

[37] Plains All American Pipeline (2014) *Yorktown Terminal Update*. Presentation to Railroad Safety and Security Task Force. October 24, 2014. Norfolk, VA.

Supreme Court has resoundingly upheld as constitutional under the Commerce Clause (Article I, Section 8, Clause 3).[38]

Virginia's State Corporation Commission (SCC) is responsible for assisting the FRA in maintaining the safety and efficiency of Virginia's railway system.[39] In 1970, Congress passed the Federal Railroad Safety Act (FRSA), which gave authority to the U.S. Secretary of Transportation to regulate all aspects of railroad safety.[40] However, two exceptions to the FRSA allow states to enforce a law or regulation until the federal government addresses the subject matter, and to enforce more stringent safety laws or regulations.[41] The more stringent standards are only allowed if the safety laws and regulations: 1) are necessary to reduce the apparent hazard; 2) are not incompatible with federal laws; and 3) do not burden interstate commerce.[42]

With respect to crude oil and ethanol transportation, it is important to note that the railroads themselves do not usually own the railcars in which these products are shipped; rather, the tank cars are leased by the shipper and the railroads, as common carriers, are required to accept them if properly packed and labeled in accordance with Title 49 CFR.

Railroad yard operations create a heavy industrial setting and safety is paramount. Train movements into and out of yards are compounded by the constant shifting and movement of railcars from one track to the other. The lighting of railroad yards at night to enhance employee safety, particularly on HHFT routes, was brought to the attention of the Task Force by several railroad operating employees. The topic of yard lighting was noted as a potential area for future review and recommendation.

Railroad train operations typically include one, two, or three person crews. Long-haul non-stop trains typically have fewer crew members necessary for safe train operations. Another potential area for future discussion is the optimal number of crew members necessary to safely operate certain trains identified by commodity types being hauled.

PREVENTION

The best way to ensure the overall safety and security of Virginia's rail network is to prevent the occurrence of incidents arising from a wide range of potential hazards. While the development

[38] United States v. E.C. Knight Co., 156 U.S. 1, (1895); Houston E. & W.T.R. Co. v. United States, 234 U.S. 342 (1914).

[39] Department of Rail and Public Transportation (2014) *DRPT Role in Rail Safety and Security*. Presentation to Rail Safety and Security Task Force. June 4, 2014. Richmond, VA.

[40] *Id.* 5.

[41] State Corporation Commission (2014) *Railroad Safety*. Presentation to Rail Safety and Security Task Force. June 4, 2014. Richmond, VA.

[42] *Id.*

and promulgation of rail safety regulations is almost exclusively a federal government responsibility, there are three areas where the Commonwealth of Virginia can play a role in preventing rail accidents or incidents: 1) rail safety inspection; 2) trespassing reduction; and 3) infrastructure protection.

RAIL SAFETY INSPECTION

Railroad regulation represents one of the original areas of responsibility assigned to the SCC when it was created by the Virginia Constitution of 1902. Today, the Railroad Safety Section within SCC's Division of Utility and Railroad Safety works with the FRA to help ensure the safe operation of railroads within the Commonwealth. SCC's railroad safety staff: investigates citizen complaints regarding blocked rail crossings; conducts accident investigations; inspects railroad tracks, railcars, and locomotives; and reviews railroad operating procedures to help ensure compliance with FRA standards.

TRESPASSING REDUCTION

Walking, riding, or driving on railroad tracks, bridges, trestles, or other property constitutes trespassing and carries a high risk of severe injury or death. Trains can approach suddenly and have limited ability to stop when approaching pedestrians or vehicles traveling along the right-of-way, or that have ignored warning signs/devices at grade crossings. Beyond the obvious potential for individual death or injury, trespassing increases risks to the broader community, as well. A train attempting to stop for an unexpected obstruction will likely require an emergency brake application that could cause severe damage, or even a derailment, and potentially trigger a major incident. Vehicle traffic along the right-of-way can cause damage to rails, ties, or supporting ballast, potentially leading to a derailment. Increased enforcement of existing or expanded state laws against trespassing on railroad property, coupled with public education efforts such as Operation Lifesaver,[43] hold promise for improving rail safety and security across the Commonwealth.

INFRASTRUCTURE PROTECTION

Virginia's rail system meets every definition of critical infrastructure, but its scope and breadth presents a unique protection challenge. Since it is not possible to physically secure the right-of-way, except in a small number of vital locations, railroads and government agencies at the local, state, and federal levels are extremely reliant on criminal and homeland security intelligence and analysis to identify and disrupt potential threats to tracks, trains, people, or facilities. While the Commonwealth has systems to develop and share relevant intelligence and threat analyses among agencies and organizations with specific interests, security protocols, and a "need-to-

[43] Operation Lifesaver, Inc. (2015) http://www.oli.org. Alexandria, VA.

know," the supporting processes and capabilities can always be enhanced to address expanding mission requirements.

RESPONSE CONSIDERATIONS

Virginia is no stranger to the potential safety and security challenges posed by rail transport of hazardous materials through the Commonwealth. For more than 30 years, the Virginia Department of Emergency Management (VDEM), in partnership with the Virginia Department of Fire Programs (VDFP) and a number of local fire departments, has maintained a regional hazardous materials response program, as well as a statewide HAZMAT training program for first responders across Virginia.[44]

On May 29, 2014, the VDFP hosted a workshop for PHMSA that brought fire chiefs from several jurisdictions across the United States, who experienced crude oil train derailments and fires, to Virginia to identify opportunities for improving the fire service response to this type of emergency. The resulting report[45] suggested several immediate actions that VDFP and other state and local agencies have already started implementing.

While the likely strategy for dealing with a major derailment and fire would not involve extinguishing the burning material, as demonstrated in Lynchburg and other recent incidents, there are some locations in Virginia where a major fire could pose a great enough risk to life and property that an aggressive and protracted firefighting operation would be the only tactical option.

This type of incident truly represents a worst-case scenario and would require specialized training, expertise, equipment, and personnel that will immediately exceed the available response resources in the Commonwealth. Foam firefighting is a highly-technical discipline that requires a level of training, experience, and equipment that is difficult to maintain given the low frequency of events in Virginia that require the use of this capability. This is not to say that Virginia doesn't have a need for additional capacity to address the risk of such emergencies, but rather that maintaining a level of capability to deal with the worst-case scenario will be very costly and require continual investments in personnel, equipment, training, and supplies.

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[44] Virginia Department of Emergency Management (2015) *Hazardous Materials Response Program*. http://www.vaemergency.gov/em-community/hazmat/program-overview

[45] U.S. Department of Transportation (2014) Pipeline and Hazardous Materials Safety Administration. *Crude Oil Rail Emergency Response: Lessons Learned Roundtable Report*. July 1, 2014. Washington, DC.

INFORMATION SHARING

In the interest of furthering a "whole community" approach to emergency preparedness, the Task Force believes that general information regarding commodity flows along rail lines should be readily available to the public. To this end, the notifications that railroads transporting crude oil trains of more than 1 million gallons must provide to states, pursuant to federal emergency order, are now routinely shared on VDEM's website.

More specific information on railroad-related infrastructure, train locations and consists, and detailed hazardous materials response plans should be readily available to local and state response agencies for planning, response, and recovery. However, this type of information could be used for nefarious purposes and must be protected to help ensure the safety and security of both rail corridors and shippers/consignees across the Commonwealth. Current laws make it difficult to strike a balance between appropriate public release and facilitating secure, detailed, real-time information sharing between state agencies, local emergency management officials, railroads, and other key response partners.

STATE AGENCY ROLES

While railroad safety and security in the Commonwealth is a collaborative effort—with contributions from a wide range of federal, state, local, and private sector partners—the recommendations in this report are focused at the state level and will largely be facilitated by the state agencies represented on the Railroad Safety and Security Task Force.

VIRGINIA DEPARTMENT OF EMERGENCY MANAGEMENT (VDEM)

VDEM is an agency within the Public Safety and Homeland Security Secretariat. VDEM currently has seven divisions: Operations; Training and Exercise; Finance and Grants; Preparedness; Recovery and Mitigation; Local Support Services; and Technological Hazards. In coordination with state agencies and other partners, VDEM is responsible for: maintaining state emergency management plans, including the Commonwealth of Virginia Emergency Operations Plan (COVEOP); reviewing local emergency plans; staffing the Virginia Emergency Operations Center (VEOC); supporting search and rescue activities; responding to HAZMAT incidents; coordinating disaster mitigation, response, and recovery; managing federal grant funding for emergency management and homeland security-related activities; and conducting statewide training and exercises. VDEM's cadre of eight regional HAZMAT and radiological officers, thirteen regional HAZMAT teams, and regional HAZMAT coordinators are continuously prepared to respond across the Commonwealth. In the event of a rail incident, VDEM will initiate and staff the VEOC, notify the Virginia Emergency Response Commission (VERC), and help coordinate response and recovery activities.

VIRGINIA DEPARTMENT OF RAIL AND PUBLIC TRANSPORTATION (DRPT)

DRPT is one of six agencies administered by Virginia's Secretary of Transportation. The DRPT reports alongside the Virginia Department of Transportation (VDOT) to the Commonwealth Transportation Board (CTB), which directly reports to the Secretary of Transportation. DRPT and VDOT both assist in providing safety to all federally classified railways through the administration of several rail infrastructure improvement grant programs and highway grade crossing safety upgrade grants. DRPT also collaborates with the SCC to improve rail safety and security through the distribution of many of its codified grant funding programs, improvement of operating practices, provision of track infrastructure improvements, and enhancement of signal systems and crossing upgrades.[46]

VIRGINIA DEPARTMENT OF HEALTH (VDH)

Virginia's State Health Commissioner, who oversees multiple subsectors of the agency, administers VDH. The Health Commissioner also acts as the incident commander on VDH All-

[46] Department of Rail and Public Transportation (2014) *DRPT Role in Rail Safety and Security*. Presentation to Rail Safety and Security Task Force. June 4, 2014. Richmond, VA.

Hazards Incident Management Team (AHIMT) activations. Among its various agency duties, VDH is responsible for: instituting an all-hazards approach to public health; medical consultation; coordinating emergency preparedness, response, and recovery issues with local health districts, hospitals and other healthcare facilities; and providing technical assistance and support to other agencies. VDH is responsible for implementing state-level Emergency Support Functions (ESFs) 3 (Public Works and Engineering) and 8 (Health and Medical) under the COVEOP. During a HAZMAT incident, VDH's Offices of Epidemiology, Drinking Water, Environmental Health, and Radiological Health will engage, as needed, with local and state response partners. VDH also manages the Virginia Medical Reserve Corps (MRC).[47]

VIRGINIA STATE POLICE (VSP)

VSP is Virginia's statewide law enforcement agency with jurisdiction throughout the Commonwealth. In addition to enforcing criminal laws, traffic safety, and crime prevention, the VSP has extensive all-hazards training in the areas of anti-terrorism, threat assessment, weapons of mass destruction, vehicle crash investigations including crashes at railroad grade crossings, arson and explosives investigation, HAZMAT response, and crime scene investigation. Additionally, VSP oversees the Virginia Fusion Center (VFC), in cooperation with VDEM, bringing together emergency response stakeholders from multiple disciplines to gather, analyze, and respond to real-time threats and hazards.[48]

VIRGINIA DEPARTMENT OF FIRE PROGRAMS (VDFP)

VDFP is located within the Secretariat of Public Safety and Homeland Security. VDFP currently has five major functions: funding; professional development; research; operational support and technical assistance; and fire prevention inspections. VDFP supplements funding to localities, trains and certifies first responders statewide, and enforces fire codes across the Commonwealth. VDFP is also responsible for: the Virginia Fire Marshal Academy (VFMA); aircraft rescue firefighting (ARFF) program; adherence to the National Incident Management System Incident Command System (NIMS-ICS) training; and providing specialized training for technical rescue and other capabilities. VDFP prepares Virginia's first responders, fire departments, and citizen volunteers to be ready for incidents arising from all hazards. The agency has seven strategically located offices throughout the Commonwealth to ensure strong partnerships with Virginia's 715 fire departments, and to provide immediate support and technical assistance during a large-scale incident.

[47] Virginia Department of Health (2014) *Emergency Preparedness and Response Programs*. Presentation to Rail Safety and Security Task Force. June 4, 2014. Richmond, VA.

[48] Virginia State Police (2014) Presentation to Rail Safety and Security Task Force. June 4, 2014. Richmond, VA.

VIRGINIA DEPARTMENT OF ENVIRONMENTAL QUALITY (VDEQ)

VDEQ is an agency within the Natural Resources Secretariat whose mission is the protection of human health and the environment. VDEQ is responsible for the enforcement of Virginia's air, water, and waste laws and regulations. This includes the laws and regulations governing the bulk storage of oil, and the transportation of oil by pipeline and vessels. In the context of hazardous materials incidents, VDEQ accomplishes its mission by providing timely responses to pollution incidents within the Commonwealth and providing regulatory and technical assistance to partner agencies and responsible parties (RPs). VDEQ ensures that RPs mitigate environmental impacts and restore the environment to pre-impact conditions. VDEQ maintains two funding streams that can be used to initiate response actions when RPs fail to act, or do not act in a timely manner after an event. VDEQ—along with local, state, federal, and non-governmental organization (NGO) partners—is an active member of several spill contingency planning entities: EPA Regional Response Team III; the Virginia Coastal Area Committee; EPA Region III Inland Area Committee; and the Upper Chesapeake Estuary Committee. The ongoing mission of these entities is all-hazards preparedness and response planning that includes identification and protection of environmentally sensitive areas.

VIRGINIA STATE CORPORATION COMMISSION (SCC)

The Virginia General Assembly (VGA) has granted jurisdiction to the SCC over the safety and operation of railroads in a number of areas, including Chapter 13 of Title 56 of the Code of Virginia ("Code"). Many of these statutes were included in the Code of 1919 and have not been updated for quite some time. The provisions of the Code dealing with railroad operations have been expressly preempted by the 1996 Interstate Commerce Commission Termination Act (ICCTA), 49 USC § 10101, which states, "the remedies provided under [the ICCTA] with respect to regulation of rail transportation are exclusive and preempt the remedies provided under Federal and State law." In addition, a number of the Code's provisions regarding the regulation of rail safety have likely been preempted by the 1970 Federal Railroad Safety Act (FRSA), 49 USC § 20101, (as amended) which provides that states may only continue to enforce laws, "related to railroad safety or security until the Secretary of Transportation (with respect to railroad safety matters), or the Secretary of Homeland Security (with respect to railroad security matters), prescribes a regulation or issues an order covering the subject matter of the State requirement." If the applicable Secretary has issued rules, the SCC will generally be preempted in that subject area. However, under 45 USC § 436(a), the SCC retains authority to bring an enforcement action if the federal authority fails to act within sixty days. Thus, while the SCC continues to regulate railroads under the existing Code provisions, its authority to do so is subject to federal limitations.

RECOMMENDATIONS

The Task Force recommendations described in this section represent a comprehensive approach to rail safety and security in Virginia. Some of the recommendations are already being addressed by agencies on the Task Force; others will take additional time, funding, legislation, and/or regulation to accomplish. Given the collaborative nature of these recommendations, with contributions from multiple agencies and organizations required for ultimate success, in most cases specific agencies are not identified since the majority of these efforts will be approached collaboratively by the Task Force agencies and their partners.

A. PREVENTION

1. Increase risk-based rail safety inspections.

   Under authorities delegated by the FRA, the SCC is expanding its existing rail safety inspection program to address the challenges posed by high-hazard flammable trains. Shortly after the Lynchburg incident, the Commission authorized a third track inspector position which has been filled. Based on a number of factors continuously reviewed by the Commission's Division of Utility and Railroad Safety, the SCC intends to add additional inspectors. This will continue an effective rail safety inspection program and better supplement FRA's inspection activities in Virginia.

2. Allow states to access FRA's enforcement process.

   Advocate for revisions to the FRA's enforcement process to provide Virginia and other states with access to the disposition of all violations cited in their respective states, and consider states' input in the enforcement process.

3. Include inspection data from states in the FRA's plans and processes.

   State inspection data should be included in FRA's National and Regional Inspection Plan development and risk modeling activities. The inspection data should also capture the exact location of defects to allow mapping in a Geographic Information System (GIS) database to better identify areas with repeated safety issues.

4. Require more frequent ultrasound examination of rail (Sperry Car) on tracks carrying passengers, crude oil, or bulk hazardous materials.

   Currently, 49 CFR § 213.237 Inspection of Rail, requires an internal rail inspection on Class 4 and 5 track, or Class 3 track with regularly-scheduled passenger trains or on a hazardous materials route, at intervals not exceeding 370 days. The frequency of these examinations should be increased within the Commonwealth.

5. Require automated track inspection car (Geometry Car) inspections on tracks carrying passengers, crude oil, or bulk hazardous materials.

   Currently, the only requirement for the use by a Geometry Car is found in 49 CFR § 213.234, Automated Inspection of Track Constructed with Concrete Crossties. This regulation only speaks to Class 3, 4, and 5 tracks used for passenger service, not crude oil or other bulk hazardous materials. In addition, there is no requirement for the use of a Geometry Car on rail with wooden crossties, or on slower speed Class 1 and 2 tracks.

6. Increase sight distance visibility at railroad crossings.

   Recognizing that some railroads have voluntarily done so, consider amending § 56-411 of the Code of Virginia to increase sight distance visibility at crossings; the current requirement is only 100 feet on both sides of the crossing regardless of train speed. Further, there is no requirement that the railroad keep structures such as signal control buildings out of the sight plane. The majority of rail-related injuries and fatalities occur at grade crossings.

7. Require railroads to share all safety-related records.

   The Task Force recommends that railroads should be required to share all safety-related records and data with the SCC upon request; including, but not limited to:

   - *Geometry and Sperry car data*
   - *Accident information*
   - *Downloads from locomotive event recorders and braking logs*
   - *Crew schedules and timesheets*
   - *Freight manifests*
   - *Other railroad operational data*

8. The Task Force recommends that FRA require the development of rail Safety Management Systems (SMS) by the railroad industry.

   Studies have demonstrated the effectiveness of SMS on the safety of rail operations in Canada, and a number of other industries such as the airline, nuclear and chemical industries here in the United States.

9. Expand public education to reduce trespassing on railroad rights-of-way.

   Identify options for a statewide outreach campaign to help educate citizens about the individual perils, and potential community consequences, of trespassing on railroad property.

10. Increased state and local enforcement of existing state trespassing laws.

    The opportunity for increased, targeted enforcement of existing trespassing laws holds promise for preventing accidents along rail lines in Virginia. Expanded enforcement, coupled with public education, can reasonably be expected to provide some level of deterrence against trespassing. Analyzing enforcement trends may also identify specific locations where railroads could make capital improvements to facilitate safe and lawful access across their rights-of-way.

B. PLANNING

11. Develop comprehensive railroad response plans.

    Each local government and state agency with railroad exposure should develop a rail safety and security response plan as part of its all-hazards emergency operations plan (EOP). These hazard-specific plans/annexes should identify the threats, vulnerabilities, and potential consequences of a spill, release, or fire associated with a derailment or other incident.

12. Review, evaluate, and suggest improvements to Local Emergency Planning Committees' (LEPCs) community hazardous materials response plans for bulk transport of flammable liquids.

    All Virginia localities are responsible, through their LEPCs, to develop community hazardous materials response plans. The Task Force recommends that all communities along routes that routinely transport bulk flammable liquid shipments ensure that their response plans adequately address this hazard. The Task Force recommends that localities submit their plans to VDEM for review, evaluation, and suggested improvements.

13. Conduct various threat assessments for HAZMAT transportation, to include cyber impacts.

    As part of the overall Commonwealth Threat and Hazard Identification and Risk Assessment (C-THIRA) process, address the transportation of bulk flammable liquids by rail and other transportation modes. This assessment should incorporate all

natural and human-caused threats to public safety that may result from a spill or release due to a derailment or other intentional or accidental situation.

14. Complete targeted physical security assessments for railroad and adjacent critical infrastructure along rail lines.

    The Commonwealth, U.S. Department of Homeland Security (DHS), and the railroads should ensure all appropriate physical security assessments are complete/updated, with the resulting information made available to state agencies and local governments with the appropriate safeguards for Protected Critical Infrastructure Information (PCII).

15. Develop an inventory of high-priority corridors and potential improvements.

    Based on the assessments described above, the Task Force recommends that DRPT identify those track segments that could be improved through reasonable infrastructure enhancements.

16. Continue monitoring intelligence and analyzing threats or suspicious activities involving railroad infrastructure or assets.

    Continued threat monitoring is a vital action for the Commonwealth. Through this monitoring, state and local law enforcement, in conjunction with the railroads, may provide early warning of any criminal activity and other threats to railroad infrastructure or trains.

17. Consider railroad safety and security in the overall Port of Virginia risk assessment.

    The Hampton Roads Area Maritime Security Executive Committee (AMSEC), co-chaired by the USCG and Federal Bureau of Investigation (FBI), is currently working on a comprehensive revision to the overall risk assessment for the entire Port of Virginia, including the Yorktown terminal facility that receives crude oil for transfer to barges and further maritime transport to refineries along the East Coast. Multiple local, state, and federal agencies, including the Office of the Secretary of Public Safety and Homeland Security, are represented on the AMSEC and its risk assessment working group.

18. Continue existing regional/collaborative planning efforts.

    The Federal Clean Water Act, and subsequent Oil Pollution Act of 1990, established a requirement for the existence of regional response teams and, at the local level, inland and coastal area committees. These organizations serve as preparedness and

response planning bodies whose membership is made up of federal, state, local, and NGO entities that have roles in all-hazards response planning. VDEQ, VDEM, and other state agencies will continue working with planning partners in the framework of these existing contingency planning entities (EPA Regional Response Team III, the Coastal Virginia Area Committee, and the Upper Chesapeake Estuary Committee) to evaluate gaps associated with threats posed by shipments of bulk flammable liquids.

19. Develop a Geographic Response Plan (GRP) for above the tidal James (i.e., up the James River from the fall line in Richmond).

    GRPs provide responders with tactical guidance including maps, descriptions of at-risk sensitive areas, key resources, booming and equipment deployment strategies to protect those areas/resources, and environmental protection priorities for various spill scenarios. Virginia's Coastal Area Contingency Plan contains GRPs for Virginia's tidal waters including the James River up to Richmond; however, no formal GRPs exist above the tidal James except as issues are addressed through local emergency operations plans (EOPs). The Task Force proposes a collaborative local, state, federal, and NGO effort to identify at-risk sensitive areas and key resources for the current crude-by-rail route; and to develop integrated GRPs/EOPs for this corridor.

C. RESPONSE

20. Develop/improve air and water plume modeling capabilities for response/recovery activities.

    Plume models are an important tool for predicting the fate and transport of airborne vapors and combustion products, and waterborne transport of materials following a spill or release of flammable liquids. While some modeling capability does exist within the Commonwealth, the predictive quality and efficacy of such models should be evaluated by the relevant Task Force agencies and improvements made as needed.

21. Maintain capability to assess impacts on public health and drinking water systems.

    VDH, with support from its federal partners and their deployable experts, has the capacity to determine the potential health impacts of hazardous materials spills on the public at-large, and on drinking water systems. The Task Force recommends that VDH maintain these capabilities at the highest level.

22. Provide improvements/upgrades to regional HAZMAT Teams.

The Task Force recommends that VDEM continue supporting the regional contract HAZMAT response teams, identify a mechanism to increase funding to the localities providing staff for these teams, and increase the number of VDEM regional hazardous materials officers in areas with substantial volumes of bulk flammable liquids and other hazardous materials.

23. Coordinate behavioral health response.

VDH has legal authority over behavioral health response at the state level. The Task Force recommends that VDH ensure that incidents arising from the bulk transport of flammable liquid by rail are included in their behavioral health response plans.

D. INFORMATION SHARING

24. Information sharing regarding transport and derailment.

The Task Force believes the bulk transport of flammable liquids by rail deserves greater transparency and communication. The Task Force recommends that stakeholders explore better mechanisms to share information, while still honoring the legitimate security and competitive advantage concerns associated with rail transport. Similarly, there is a need to pass information regarding derailments of all types in a more timely and accurate manner.

25. Develop a standard reporting template.

The USDOT Emergency Order of May 7, 2014, does not specify a reporting template for crude-by-rail shipments or derailments. The Task Force supports the development of a standardized reporting template for use nationwide.

26. Develop a national comment forum.

The Task Force notes that there is no current vehicle for the easy exchange of information on bulk transport of flammable liquids by rail between states. The Task Force supports the development of such a vehicle at the federal level.

27. Notify stakeholders of all updates and safety issues received.

The operational environment around the bulk transport of flammable liquids by rail is dynamic and involves many groups and areas of concern. The Task Force recommends that a process be established where relevant technical, safety, and

incident information updates can be distributed to all affected parties, with the appropriate safeguards against unauthorized use.

28. Formalize and strengthen information sharing agreements at all levels of government and with the private sector.

    The issue of rail safety and security cuts across all levels of government, the private sector, and the citizenry at large. The Task Force recommends that all groups review their formalized agreements, where they exist, and ensure that they address rail safety and security issues. Where they do not already exist, it is recommended that formal agreements be established in accordance with applicable regulations.

29. Improve availability of federal subject matter experts.

    Much subject matter expertise relevant to the bulk transport of flammable liquids by rail resides within the federal government. The Task Force recommends that all state agencies leverage this federal expertise where available, especially during an event. Agencies are encouraged to strengthen existing coordination with federal counterparts and ensure clear information exchange is expected during incidents.

30. Improve situational awareness.

    There is a need to improve situational awareness, and information flow in general, surrounding the bulk transport of flammable liquids by rail. The Task Force recommends an aggressive study of how best to ensure timely and accurate information sharing and situational awareness regarding an incident involving hazardous materials.

E. TRAINING

31. Schedule and regularly conduct railroad safety training in order to maintain proficiencies in the latest hazard-specific safety issues.

    VDEM, in coordination with other state agencies and first responder stakeholder groups, should develop and maintain training programs for first responders at the local and state level to address rail-related safety issues. In developing these programs, VDEM should work with industry partners (e.g., CSX, NS, Plains, etc.) to ensure the most accurate and recent information is used. Similarly, technical expertise from DRPT, VDH, and VDFP should be leveraged for best practices surrounding HAZMAT incident response and recovery. A partnership with VDFP is

also recommended to determine whether railroad safety and response workshops could be included in VDFP's regional schools.

32. Encourage the use of existing online training platforms by first responders.

    Existing online training programs provided by industry, NGOs, and government agencies should be identified and utilized by first responders at the state and local level.

33. Provide information and training for suspicious activity reports.

    Suspicious activity reports (SARs) are the primary vehicle for tracking suspicious activities involving critical infrastructure within the Commonwealth. The Task Force supports additional training on SARs for appropriate state and local agency officials.

34. Develop a bulk liquids spill course for HAZMAT operations, technician, and specialist-level responders.

    The Task Force believes that enhanced, hazard-specific training for bulk transport of flammable liquids may be appropriate. The training should be presented at two levels: the operations level for first responders, and the technician/specialist level for members of HAZMAT response teams. Agencies should determine whether off-the-shelf training is adequate, or if Virginia should develop new training curricula that addresses the Commonwealth's specific needs.

35. Create a rail specialist qualification program for certified HAZMAT specialists.

    Other states have created a Rail Hazardous Materials Specialist designation for hazardous materials response specialists. The Task Force recommends that VDEM investigate these programs and adopt or develop such a certification for Virginia.

36. Improve access to specialized training at the Security and Emergency Response Training Center (SERTC) and Texas A&M Engineering Extension Service (TEEX), to include leveraging railroad scholarships and a mechanism to provide backfill costs.

    SERTC and TEEX provide specialty training at reasonable or no cost. Full-scale railroad hazardous materials emergency training is available through the American Association of Railroads (AAR) SERTC facility in Pueblo, CO, while TEEX is a global leader in foam firefighting training. The Task Force recommends that VDEM and VDFP, in coordination with other state agencies, explore and develop a strategy to allow a greater number of Virginia responders to attend training opportunities at these facilities. This strategy should leverage existing scholarships provided by

Virginia's railroads, and address the costs to backfill front-line positions while students are attending this training.

37. Purchase additional training props and simulators, and other equipment specific to bulk flammable liquid response, for Virginia's Chemical, Biological, Radiological, Nuclear, and Explosive (CBRNE) Response Training Center in Yorktown.

    The CBRNE Training Center in Yorktown provides classroom and hands-on training for hazardous materials and CBRNE response activities. Funding for additional props and simulators to support training for bulk flammable liquids in rail transportation will improve Virginia's overall response posture. The Task Force also recommends that agencies identify other appropriate training aids to enhance current fire and hazardous materials training across the Commonwealth.

38. Provide additional incident command training.

    Given the multi-jurisdictional and collaborative nature of any successful response to a railroad emergency, the Task Force recommends additional incident command system training across the Commonwealth—with scenarios related to HHFT incidents—be delivered to local, state, federal, and industry partners.

F. EXERCISES

39. Conduct tabletop exercises with key agencies and officials.

    Exercises occur along a spectrum from tabletop discussions to field-based activities. The Task Force encourages exercises involving scenarios including the bulk transport of flammable liquids by rail. The Homeland Security Exercise and Evaluation Program (HSEEP), administered by VDEM, provides a vehicle for conducting such exercises. All agencies and localities are encouraged to participate in the HSEEP and, where relevant, to include rail scenarios in their exercise programs.

40. Evaluate the utility of an exercise-in-a-box program for railroad emergencies.

    VDEM should explore the feasibility and utility of a simple and efficient "exercise-in-a-box" for rail incidents that could be easily implemented at the local level with minimal support.

41. Fund regional and interagency drills.

The Task Force supports the provision of additional exercises and drills, in localities across the Commonwealth, that address the bulk transport of flammable liquids by rail, road, and maritime conveyance.

G. EQUIPMENT

42. Purchase and stockpile additional containment booms to address waterway spills.

Containment booms can be an effective waterborne spill countermeasure under some circumstances. The Task Force recognizes a need for additional booming equipment strategically placed throughout the Commonwealth. This recommendation includes: a review of existing boom capabilities; identifying appropriate additions and upgrades; and choosing appropriate locations for the cached booms.

43. Maintain and expand foam firefighting capability.

Beyond the need for specialized training described previously, the Task Force recommends continued investment in, and synchronization of, foam firefighting capabilities deployed by state and local response agencies across Virginia. The Commonwealth might also consider alternative methods for ensuring the availability of the specialized expertise, equipment, and supplies that would be required for a major spill/fire incident involving shale crude oil or ethanol.

H. FUNDING

44. Create a sustainable state-level funding source.

The Task Force recommends that Virginia consider creating a sustainable funding source that could be used to support the activities recommended in this report for state and local agencies/organizations. This recommendation may require legislative or regulatory action.

45. Leverage existing federal homeland security grant funding sources.

State agencies and localities are encouraged to propose eligible projects to the DHS-funded State Homeland Security Grant Program (SHSGP) and Urban Areas Security Initiative (in eligible geographic areas) to implement recommendations contained in this report.

46. Encourage development of new and expanded federal grant programs specific to preparing for high-hazard flammable trains.

    Given that rail safety regulation is predominately addressed at the federal level, the Task Force believes that existing federal grant programs should be enhanced, and new ones created, to address the hazards posed by HHFTs in states where they travel.

47. Encourage railroads operating in Virginia to enhance their existing grant programs.

    The Task Force acknowledges the voluntary financial support of Virginia's railroads and, given the expanding nature of the threats posed by HHFTs, hopes that an enhanced level of funding will be considered to help support local government and NGO preparedness activities.

48. Encourage railroads to make targeted infrastructure improvements.

    Recognizing that providing state funds to private corporations for infrastructure improvements may be difficult, the Task Force recommends that Virginia explore other mechanisms to encourage safety and security-related infrastructure improvements within the rail sector.

I. REGULATORY AND LEGISLATIVE

49. Provide comments on federal rulemaking activities.

    The Task Force recommends that all state agencies and localities take the opportunity to comment on any proposed rulemaking by USDOT or other federal agencies involving the bulk transport of flammable liquids by rail.

50. Federal legislation regarding DOT 111 tank cars.

    The Task Force recommends that all affected stakeholders take the opportunity to comment and provide testimony on any rulemaking action involving the design, construction, and operation of DOT 111 and similar railcars.

51. Affixing additional placards.

    The Task Force encourages USDOT to consider requiring the placement of additional HAZMAT identification placards on railcars transporting bulk flammable liquids.

52. Improve the characterization and classification of shale crude oil.

    The Task Force encourages USDOT to continue its efforts to promote rigorous testing and characterization/classification of shale crude oil through PHMSA's Operation Safe Delivery program.[49]

53. Restrict rail speeds based upon the commodity being transported.

    The Task Force recognizes that FRA has imposed speed restrictions on crude oil trains and recommends consideration of additional restrictions that may be appropriate in densely populated or environmentally sensitive areas.

54. Develop a compliance monitoring program and increase fines for deficiencies.

    The Task Force recommends that DRPT explore the possibility of monitoring railroad safety and security compliance and consider increasing fines for deficiencies or recurring issues that may be found.

55. Explore modifications for DRPT funding programs available to railroads operating in Virginia.

    Allow railroads to utilize FRA fines as a local match, allow safety-related capital improvements to be an eligible use of program funds, and allow use of some safety enhancement funds as a match. The Task Force believes this is a reasonable use of such fines and encourages legislative or regulatory action to allow it.

[49] USDOT/PHMSA (2015) *Operation Safe Delivery*. Washington, DC. http://www.phmsa.dot.gov/hazmat/osd/calltoaction

CONCLUSION

After almost a full year of research, four meetings, and extensive feedback from multiple information sources, the Virginia Railroad Safety and Security Task Force has developed a pragmatic list of recommendations that account for many facets of this complex and dynamic public policy space.

The Task Force agencies will continue monitoring new developments, best practices, investigation findings, and after-action reviews to refine their recommendations and implementation plans. As the recommendations in this report are addressed, the Task Force anticipates annual meetings, at minimum, to track progress and coordinate activities.

Moreover, and given their charge from Governor McAuliffe, Task Force members have not waited for this report to start enhancing the Commonwealth's collective ability to protect life, property, and the environment. New and expanded initiatives for prevention, training, response, and information sharing are well underway. Contributing to this sense of urgency, most of the Task Force agencies were represented on the scene of the 2014 Lynchburg incident, where they experienced first-hand the impact of a derailment, spill, and fire involving a high-hazard flammable train.

The safety of communities and the environment along Virginia's rail corridors will always be a top priority and Task Force agencies—in concert with localities and partner organizations—will take action when and where necessary to prevent, prepare for, respond to, and recover from rail-related incidents anywhere in the Commonwealth.

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ACRONYMS & ABBREVIATIONS

ANPRM	Advanced Notice of Proposed Rulemaking
AAR	American Association of Railroads
ACE	Assessment of Chemical Exposures
CBRNE	Chemical, Biological, Radiological, Nuclear, and Explosive
CFR	Code of Federal Regulations
CI/KR	Critical Infrastructure/Key Resources
Code	Code of Virginia
CSX	CSX Transportation
DEQ	Virginia Department of Environmental Quality
DHS	Department of Homeland Security
DOT 111	Tank cars built to USDOT specification 111-A100W1
DRPT	Virginia Department of Rail and Public Transportation
EMS	Emergency Medical Services
EPA	Environmental Protection Agency
EPCRA	Emergency Planning and Community Right to Know Act of 1986
ERHMS	Emergency Responder Health Monitoring and Surveillance
ESF	Emergency Support Function
FRA	Federal Railroad Administration
FRSA	Federal Rail Safety Act of 1970
HAZMAT	Hazardous Materials
HHFT	High-Hazard Flammable Train
IAP	Incident Action Plan
ICS	Incident Command System
LEPC	Local Emergency Planning Committee
LRT	Light Rail Transit
MARFF	Mobile Airport Rescue Fire Fighting
NIMS	National Incident Management System
NPRM	Notice of Proposed Rulemaking
NS	Norfolk Southern Corporation
NTSB	National Transportation Safety Board
PHMSA	Pipeline and Hazardous Materials Safety Administration
PSA	Protective Security Advisor
SAR	Suspicious Activity Report
SCC	Virginia State Corporation Commission
SERTC	Security and Emergency Response Training Center

SFPE	Structural Firefighter Protective Equipment
SHSGP	State Homeland Security Grant Program
SMS	Safety Management System
TEEX	Texas A&M Engineering Extension Service
UASI	Urban Areas Security Initiative
USC	United States Code
VDEM	Virginia Department of Emergency Management
VDFP	Virginia Department of Fire Programs
VDH	Virginia Department of Health
VDOT	Virginia Department of Transportation
VEOC	Virginia Emergency Operations Center
VERC	Virginia Emergency Response Council
VFC	Virginia Fusion Center
VFCA	Virginia Fire Chiefs Association
VPFF	Virginia Professional Fire Fighters
VRE	Virginia Railway Express
VSFA	Virginia State Firefighters Association
VSRP	Virginia Statewide Rail Plan
VSP	Virginia State Police
WMATA	Washington Metropolitan Transit Authority