Coffee Break Training – Hazardous Materials

Petroleum Crude Oil: Implementing Response Objectives

No. HM-2014-7 December 1, 2014

Learning Objective: *The student will be able to explain the key factors for developing an initial response strategy for a crude oil rail transportation incident.*

The initial stage of an incident involving crude oil should include an analysis of appropriate site-specific response procedures and potential effects that an incident would have on nearby life, property, critical systems and the environment. Traditional firefighting strategies and tactics may not be effective in these situations. These incidents also need to be approached and managed as a hazardous materials problem to ensure that proper and appropriate technical assistance and the support of outside resources are notified and requested as soon as possible.

Life safety, foam supply, equipment, water supply, resources and fire/spill scenarios are critical factors in developing an initial response strategy for a crude oil rail transportation incident.

The following factors should be considered as part of developing the initial response strategy to determine whether the incident should be handled offensively, defensively or by nonintervention:

- **Are there any life safety exposures in danger that responders must address right now, and can responders safely evacuate or protect in place?** Number of people to be protected, ability of public to move, available time, resources needed, adequate facilities to shelter evacuees.
- **Can responders safely approach the incident?** Location of the incident, access and terrain, number of tank car(s), extent of damage, size of spill, leak or fire involved.
- **Do responders fully understand the nature and scope of the problem?** A hazard assessment and risk evaluation must be completed, and the results must be shared with technical specialists from the railroad and/or shipper.
- **If a fire is involved, do responders have immediate access to sufficient foam and water supplies that are required for effective fire control/suppression operations?** Most fire departments will not have adequate foam, water or spill control resources for an initial attack on a crude oil derailment scenario with large fires. Defensive operations will likely be required until sufficient foam concentrate, water, spill control and related support resources are on-scene.
- **If a spill is involved, do responders have the necessary spill control equipment readily available on-site?** Do responders have spill control and vapor suppression equipment/chemicals available on-site?
- **Can fire suppression agents be effectively applied to the tank car(s) involved? Can cooling water be effectively applied to any exposures impacted by direct flame impingement?** Fire suppression agents and cooling water must be able to reach their intended targets to be effective. If access, supply or equipment is limited, the ability of suppression agents and cooling water to reach the affected area(s) will be diminished.
- **If not on fire, can potential ignition sources be removed and/or eliminated?** Vehicle traffic may need to be curtailed. Automatic switching systems (industrial air conditioning units, traffic signals, etc.) need to be switched off.
- **Will extinguishment improve or worsen the incident, and what is the environmental impact of doing so?** In some situations, the best and safest response option may be defensive or nonintervention tactics that allow the fire(s) to burn out. Attempting to extinguish the fire(s) may cause additional risk to personnel and damage to the environment. The decision to protect exposures and let the product burn must be considered.
- **Have appropriate notifications been made, or has the organization's emergency response plan been activated?** These incidents cannot be safely and effectively managed alone. Additional technical support and resources must be requested immediately in accordance with the agency's emergency response plan. The railroads and shippers will be the primary means of technical support and resources, and they are an integral component of the organization's emergency response plans, procedures and operations.

Additional informational materials for first responders to better prepare them to respond to a crude oil rail transportation incident can be downloaded at http://www.phmsa.dot.gov/hazmat/osd/emergencyresponse. Additional guidance is available from the U.S. Fire Administration — National Fire Academy at http://www.usfa.fema.gov/training/coffee_break/.