

Strategic and Tactical Guidance for Rail Incidents Involving Crude Oil

SIZE UP/INITIAL PROTECTIVE ACTIONS:

Verify Product: UN ID# 1267 Petroleum Crude Oil. See 2012 NAERG Guide 128.

Note placards and obtain a train consist from crew or RR. Are cars loaded or empty?

Notify NYS DEC, the State Watch Center (OEM, OFPC), the National Response Center and the railroad involved (see contact information on reverse).

If SPILL but NO fire:

SMALL Spill: Isolate **150 ft.** in all directions.

LARGE Spill: Also evacuate **1,000 ft.** downwind.

Secure potential ignition sources; use air monitoring; apply foam for vapor suppression; and begin spill confinement operations (diking, damming and boom deployment) to limit spread of spilled product. (See **FIRE SUPPRESSION** for foam and air monitoring guidance).

If FIRE: Isolate **1/2 MILE** in all directions and shelter downwind.

EXTINGUISH vs. LET IT BURN: Do you need to extinguish the fire?

- Evaluate life hazard, property/critical infrastructure at risk and environmental impact (in that order).
- If **a life hazard exists:** Focus available foam operations or use water fog patterns on oil fires to protect rescue operations. Conduct structural firefighting as necessary and from uphill and upwind if possible. Beware of any running spill or spill fed fire which may cut off routes to safe zones. Consider defensive operations once life hazard is addressed.
- If **NO life hazard** and **more than 3** tank cars are involved in fire OFPC recommends **LETTING THE FIRE BURN** unless the foam and water supply required to control is available (See **FIRE SUPPRESSION**). Withdraw and protect exposures, including cooling exposed tank cars with unmanned monitors if possible (See **FIRE SUPPRESSION**).
- If **3 tank cars or fewer are involved**, do you need to extinguish the fire? (Evaluate hazard to property and environment.)
- If **YES**, are foam and water resources available to extinguish the fire? (See **FIRE SUPPRESSION**)

FIRE SUPPRESSION:

Estimate the foam and water requirements for vapor suppression, extinguishment and post fire security.

OFPC **estimates** for crude oil rail scenarios are listed below. These estimates are based upon applying Class B foam at 3% concentration and can be adjusted as needed.

Polar solvents such as Ethanol may require greater amounts of foam and water and higher application rates (0.2gpm/ft²).

- **1 tank car** on fire = **600 gallons** of foam concentrate; apply solution at a target rate of **660 gpm** for **15 minutes**; and reapply as necessary to maintain foam blanket;
 - **Total water supply required = (+/-) 38,000 gallons** for foam and cooling water.
 - **NOTE:** Stream reach for single 600 gpm foam nozzle = **150' max**
- **3 tank cars** on fire = **1,500 gallons** of foam concentrate; apply solution at a target rate of **1,680 gpm** for **15 minutes**; and reapply as necessary to maintain foam blanket;
 - **Total water supply required = (+/-) 80,000 gallons** for foam and cooling water.
 - **NOTE:** Stream reach for single 1000 gpm foam nozzle= **200' max**
- Use cooling water on exposed and involved cars; minimum rate = **200 gpm** applied to the exterior of the vapor space of **each car during extinguishment and maintain for 30 minutes thereafter**. Note water application may interfere with the foam blanket. Continue to re-apply foam as needed to maintain post-fire security (vapor suppression).
- **ALL RESOURCES MUST BE AVAILABLE PRIOR TO BEGINNING SUPPRESSION (FOAM OPS)**

USE AIR MONITORING. Withdraw at **10% LEL (Combustible Gas Indicator)**. See **AIR MONITORING** on page 2 for additional guidance.

The following information is provided to assist with determining pump discharge pressures needed to provide required inlet pressure at foam master stream appliances:

- Friction loss for 4" LDH at flows noted above: 7 psi/100' at 600 gpm; 19 psi/100' at 1000 gpm.
- Friction loss for 5" LDH at flows noted above: 3 psi/100' at 600 gpm; 7 psi/100' at 1000 gpm.

To determine Foam requirements for a specific crude oil surface spill use the following formula:

$$\text{Spill Area (ft}^2\text{)} \times \text{Application Rate (0.10 gpm/ft}^2\text{)} = \text{GPM Foam Solution} \times \text{15 mins.}$$

NOTE: Large storage tank fires require higher application rates for longer duration.

AIR MONITORING:

All personnel inside exclusion zone should wear structural PPE and SCBA.

Air monitoring should be conducted to protect personnel operating within the exclusion zone and to verify isolation and protective action distances established are effective.

- Lower Explosive Limit (LEL) at or above 10% = **WITHDRAW FROM AREA.**

For unprotected personnel:

- Photoionization Detector (PID) reading above 10ppm = withdraw or don SCBA and PPE.
- Hydrogen Sulfide (H₂S) reading above 10ppm = withdraw or don SCBA and PPE.
- Oxygen (O₂) reading below 20.8% = withdraw or don SCBA and PPE.
- Colormetric tube for benzene (if available): any color change = withdraw or don SCBA and PPE.

In addition to the ½ mile isolation distance, evacuate the public downwind in areas impacted by smoke and particulates.

Note: These action levels are intended to provide basic, quick reference guidance for the initial phase of emergency operations. As any crude oil release will likely include other hazards detailed guidance should be obtained and a complete air monitoring plan implemented. Additional information is available here:

EPA Emergency Response Air Monitoring Guidance Tables (see Table 10 - Oil):
www.epaossc.org/sites/0001/files/US%20EPA%20Air%20Tables%20Edition3_FINAL%202.pdf

NIOSH Pocket Guide to Chemical Hazards: www.cdc.gov/niosh/npg/

NOTIFICATIONS/CONTACT INFO:

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|---|----------------|
| • DEC Spill Response: | 1-800-457-7362 |
| • New York State Watch Center (OEM): | 518-292-2200 |
| • OFPC 24 hr. Technical Assistance/Response: | 518-474-6746 |
| • National Response Center (EPA/USCG): | 1-800-424-8802 |
| • Chemtrec: | 1-800-424-9300 |
| • CP Rail: | 1-800-716-9132 |
| • CSX Transportation: | 1-800-232-0144 |
| • Norfolk Southern (NS): | 1-800-453-2530 |



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