South Texas Coastal Zone Area Contingency Plan (STCZACP)

Unconventional Oil Response Plan

Annex L

May 2024

Record of Changes

Change Number	Change Description	Part Number	Change Date	Name
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Table of Contents

1000 Introduction to Unconventional Oil Response Plan

1100 Pre-Incident

Recent events have brought this new threat to the attention of only portions of the response community. Many areas still lack the awareness or experience related to responding to incidents involving unconventional oils. Furthermore, responders may be unfamiliar with the parties potentially involved in an incident and their associated responsibilities, capabilities and resources. Therefore, similar to all hazard scenarios, all stakeholders must meet, communicate, plan, train, and practice/exercise accordingly.

1200 Training Opportunities

The previously mentioned ambiguities surrounding unconventional oils and the Coast Guard's unfamiliarity with responding to incidents involving rail transportation requires additional training for Coast Guard responders. Suggested training opportunities include:

- Crude by Rail (PER-327) Source: Security & Emergency Response Training Center (FEMA Funded); on-line version available; www.sertc.org
- Tank Car Specialist (PER-290), source: Security & Emergency Response Training Center (FEMA Funded); www.sertc.org
- HAZMAT Incident Response (MS-503), source Environmental Protection Agency (Coast Guard TQC Funded);
- Oil Spill Control (MS-505), source Texas Engineering Extension Service (Coast Guard TQC Funded);

1300 Exercises

Until the level of knowledge and proficiency is adequate, multiple exercises involving stakeholders should be conducted. Afterwards, an annual exercise involving key stakeholders will be appropriate. It is very important to include the shippers and carriers (railroads) in these exercises.

2000 Initial Phase

Incidents involving more volatile unconventional oils such as Eagle Ford or Bakken crude oils should be approached and managed as hazardous material incidents [2]. For incidents involving unconventional oils, the preliminary assessment is complicated due to a variety of issues.

Oil produced in shale formations can vary greatly from each geographic region and even within the same formation [1]. Therefore, unconventional oil transported on the same unit train may have hazard variations amongst carloads.

Tank cars carrying unconventional crude oil can also be found in manifest trains, which carry multiple commodities [2]. Therefore, responders must consider the potential impact of tank cars containing other hazardous commodities with tank cars carrying unconventional crude oils [2].

Currently, unconventional oils whether a more volatile Eagle Ford or more stable Black Wax oil, are transported under the shipping name "Petroleum Crude Oil" and UN1267. This leaves responders with ambiguities and a false sense of security when assessing the threat. Furthermore, companies associated with the transportation of unconventional oils may use generalized crude oil

safety data sheets (SDS), formerly Material Safety Data Sheets (MSDS), which may not include specific product hazards for the exact oil being transported [1]. Therefore, it is paramount responders carefully consider the incident-specific product(s) and recognize hazard variations may exist [1].

Responders can determine what specific commodities and associated hazards may be involved in an incident by obtaining shipping papers such as the train consist, contacting the shippers or rail carriers' emergency contact number, and obtaining product specific SDSs (i.e. Black Wax, Eagle Ford, or Bakken SDS). The conductor will have the complete train consist immediately available [2]. The origination facility will also have actual lab sampling of the specific product makeup. Additionally, field observations of placards, labels, container shapes, and marking from a safe distance can provide and validate information. Traditional response advisors such as the National Oceanic and Atmospheric Administration's (NOAA) Scientific Support Coordinator (SSC), Coast Guard's National Strike Force, and Environmental Protection Agency's Environmental Response Team should also be consulted for assistance with hazard assessment and risk evaluation.

The risks of personnel intervening directly in the incident should be evaluated. Limitations of people and resources available on site should be considered. The level of risk is influenced by not limited to; the hazardous nature of the material involved including sub-components, quantity of material involved, status of container(s) and breach/release scenarios, proximity of exposure, nature of terrain, and availability of resources such as adequate foam supply [2].

2100 Potential Hazards

As note earlier, responders must carefully consider the incident-specific product(s) and situation while also recognizing hazard variations may exist. Below is generalized information provided by the Emergency Response Guide number 128 for UN1267, Petroleum Crude Oil [3]:

- Highly flammable, will be easily ignited by heat, sparks, or flames.
- Vapors may form explosive mixtures with air.
- Vapors may travel to source of ignition and flash back.
- Most vapors are heavier than air. The vapors will spread along ground and collect in low or confined areas.
- Run-off to sewer may create fire or explosion hazards
- Container may explode when heated
- Many liquids are lighter than water

The following questions from the Region 6 LEPC may aid responder in estimating the potential impact [2]:

- What is the proximity to people, property, and the environment?
- Is the container(s) and or product on fire?
- Are other tank cars at risk?
- Do you have the capability of successfully controlling the fire spread?
- Has the container been breached and is product releasing?
- Where will the container and its contents likely travel?
- How and when will the contents get there?
- What harm will occur when the contents (plume, slick, etc…) get there?
- What is the actual amount spilled and the maximum spill potential?

3000 Initiation of Action

Based on the results of the preliminary assessment, if adequate resources are not present, they must be requested/ordered immediately. Air monitoring for the applicable flammable and toxic concentrations should be started as soon as possible. A comprehensive air monitoring plan should be developed to ensure the safety of all personnel involved and help facilitate operations.

Initial site management and control is crucial [2]. The incident area must be isolated and secured, including the evacuation of or sheltering in place of any people at risk. Ignition sources must also be secured or removed. Appropriate secure perimeters and entry control points should be established to prevent unauthorized personnel from entering the site [2]. Tape, barricades, traffic cones, or fire service/law enforcement resources can be used to establish and maintain perimeters [2]. The location of the restricted area should be communicated to all personnel operating on scene and the public through public communication systems, such as safety broadcasts [2]. The Emergency Response Guide can be used to provide initial guidance for the aforementioned actions [2].

3100 Evacuation of an Area

As note earlier, responders must carefully consider the incident-specific product(s) and situation while also recognizing hazard variations may exist. In addition, environmental factors such as weather, topography, and surrounding physical structures must be taken into consideration. Consult NOAA SSC for refinements to initial evacuation area and hot zone. Below is generalized information provided by the Emergency Response Guide number 128 for UN1267, Petroleum Crude Oil [3]:

- For a large spill consider initial downwind evacuation for at least 1000', and
- If rail car or tank car is involved in fire, isolate for 1/2 mile in all direction; also consider initial evacuation for 1/2 mile in all directions

The incident site assessment should begin from a safe distance; upwind, uphill, upstream etc… The specifics of each incident must be considered, however as a general rule: the more volatile material in the unconventional crude oil may be present in high concentrations, which creates an inhalation hazard [2]. Furthermore, products of combustion may also include toxic constituents [2]. Therefore, responders should wear self-contained breathing apparatuses (SCBAs) to avoid

potential exposure. Deviations from the aforementioned will be dictated based on the Incident Commander and Safety Officers assessment of air monitoring results and other situational factors.

An Incident Command Post should be established as soon as possible outside of the impacted area [2]. Furthermore, a Unified Command (UC) should be established consisting of those agencies and organizations, which have legal or jurisdictional responsibilities [2]. The Incident Commander should consider additional support and resources from regional, state, or federal partners [2]. In addition, non-emergency local, regional, and municipal entities may play a role and need to be integrated into the command structure (i.e. public works, transportation department) [2].

3200 Emergency Response Actions

3210 Fire

As note earlier, responders must carefully consider the incident-specific product(s) and situation while also recognizing hazard variations may exist. Below are some generalized, scenario based response actions provided by the Emergency Response Guide number 128 for UN1267, Petroleum Crude Oil [3]. In the event of a:

- **Small Fire:**
  - Use dry chemical, CO2, water spray or regular foam
- **Large Fire:**
  - Provide water spray, fog, or regular foam
  - Do not use straight streams (can create slop-over)
  - Move containers from fire area, if possible without risk
- **Fire involving Tank or Car/Trailer Loads:**
  - Fight fire from maximum distance or use unmanned hose holders or monitor nozzles
  - Cool containers with flooding quantities of water until well after fire is out
  - Withdraw immediately in case of rising sound from venting safety devices or discoloration of tank(s)
  - Always stay away from tanks engulfed in fire
  - For massive fire, use unmanned hose holders or monitor nozzles; if this is NOT possible, withdraw from area and let burn

Remember that all of these products have very low flash points and the use of water spray when fighting fire may be inefficient. For mixtures containing alcohol or polar solvent, alcohol-resistant foam may be more effective.

Runoff from fire-fighting should be prevented from entering storm/sewer systems and sensitive areas [2]. Proper authorities should be notified of potentially contaminated water [2]. Runoff may be flammable and/or toxic and should be contained, treated, and disposed of in accordance with applicable laws and regulations [2].

3220 Spill

As note earlier, responders must carefully consider the incident-specific product(s) and situation while also recognizing hazard variations may exist. Below are some generalized, scenario based response actions provided by the Emergency Response Guide number 128 for UN1267, Petroleum Crude Oil [3]. In the event of a spill or a leak:

- Eliminate all ignition sources (no smoking, flares, sparks or flame in immediate area)
- All equipment used when handling the product must be grounded
- Do not touch or walk through spilled material.
- Stop leak if you can do without risk.
- Prevent entry into waterways, sewers, basements or confined areas.
- A vapor suppressing foam may be used to reduce vapors.
- Absorb or cover with dry earth, sand, or other non-combustible material and transfer to containers.
- Use clean non-sparking tools to collect absorbed material.
- For large spill, dike far ahead of liquid spill for later disposal

When enacting any strategies such as berms or dikes that will potential collect or concentrate the spilled material; the trade-off between spill mitigation and the associated increased exposure and flammability hazards from the collected concentration of material/vapors must be considered. NOAA SCCs can be contacted to provide guidance.

3230 Boom Deployment

Initial booming strategies should include exclusion and diversion, keeping oil from sensitive areas, water intakes, and preventing the material and its associated vapors from collecting in confined areas such as under piers, wharfs, and docks.

4000 Containment, Countermeasures, and Cleanup Phase

The timing and status of the overall incident will dictate post-emergent containment, countermeasures, and cleanup strategies and tactics. Pivotal benchmarks may include extinguishment of fire with no re-flash risks and safe air monitoring results/readings.

Post-fire, smaller spills without fire, or after the lighter volatile portions of the unconventional oils have evaporated (dependent on quantity spilled and environmental factors) response methods for conventional crude oil incidents may be similarly (not exactly) utilized. Based on air monitoring results, if the threat of hazardous vapors concentrations (exposure or flammability) through containment and/or collection of material is minimal or not present, then booming strategies such as containment or diversion to collection areas may be deployed.

Additionally, the selection of response equipment both manual and mechanical such as skimmers, vacuum trucks, and absorbent/adsorbents can be utilized similarly to conventional crude oil response guidelines and standards. However, as previously mentioned, the incident specific situation and information should ultimately dictate the response strategies and tactics selection. As such, unconventional oils such as Bakken and Eagle Ford are naturally highly dispersible. These oils will submerge into the water column rendering water booming and skimming operations ineffective. On smaller canals or land-based incidents the use of berms or man-made collection

points/pools may be appropriate. The use of under-flow dam may also be appropriate depending on the type of oil or its fate/reaction.

Alternative response technologies such as dispersant, in-situ burn, surface washing agents, bioremediation, solidifiers, and herding agents may be considered. However, as noted earlier, unconventional oils exhibit properties different than conventional crude oil. Therefore application of the aforementioned alternative response technologies may be ineffective. For example, a very high percentage of unconventional oils such as Bakken and Eagle Ford disperses naturally into the water column. As a result, use of dispersants is typically not beneficial. Additionally, in-situ burning is typically not recommended for the more volatile unconventional oils such as Bakken or Eagle Ford because the fire may become hard to control. On the other hand, burning of oil sands may be an option; however the efficacy is limited if weathered.

5000 References

[1] Gulf Strike Team (2014) Bulletin Supplement; Responder Awareness – North American Crude Oil Shipments
[2] Mason, S. & Gafford, H. (2015) Region 6 LEPC Update Volume 28, No.2 February 2015
[3] Transport Canada, U.S. DOT, Secretariat for Communications and Transport & Chemistry Information Center for Emergencies (2012). Emergency Response Guide