



Community Member Preparedness for Potential Fuel Releases along Transportation Routes

Facilitator Guide

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Midwest Consortium for Hazardous Waste Worker Training

Acknowledgments

The Midwest Consortium developed this introduction to health and safety impacts of high-volume transportation of fuels to assist the local community members and business owners in becoming better prepared for possible releases along transportation routes. This work was done under cooperative agreement number U45 ES 06184 from the National Institute of Environmental Health Sciences. Several member institutions of the Midwest Consortium contributed to the development of this program. We gratefully acknowledge review comments from Gary Quick of the International Brotherhood of Teamsters, IBT Worker Training Program that strengthened the program and the support of the concept of this program from Jim Tate of BioUrga. We also thank members of CARS in Minneapolis for providing photos.

See <http://med.uc.edu/eh/academics/training/mwc> for a listing of contacts at each member institution and additional information. We encourage you to comment on these materials. Please give your suggestions to those teaching the program in which you are now enrolled, or forward them to the Midwest Consortium for Hazardous Waste Worker Training, University of Cincinnati, P.O. Box 670056, Cincinnati, Ohio 45267-0056 or click on 'contact us' at <http://med.uc.edu/eh/academics/training/mwc>.

Warning

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The material was prepared for use by experienced instructors who are providing an introduction to health and safety considerations resulting from energy transportation. Users are cautioned that the subject is constantly evolving. Therefore, the material may require additions, deletions, or modifications to incorporate the effects of that evolution occurring after the date of this material preparation.

This training does not substitute for local training on alerting systems, evacuation routes or other actions that might be required during an unplanned release.

All web links are active as of July 5, 2017; if you find an error, please inform the facilitator so that it can be updated.

Disclaimer

The Occupational Safety and Health Administration (OSHA) rule to help ensure worker health and safety during emergency responses requires introductory awareness training on basic hazard recognition and alerting, operations-level training for those who will control the spread of the hazard, away from the point of emission and technician level training for those who will work at the point of emission to stop the release. Additional categories of training are described for the Incident Commander and Specialist. See 29CFR1910.120.120(q) for complete details.

This program serves the introductory needs of residents in areas where fuels are transported in high volume in order to begin the training needed if a release occurs. This training aligns with local government and company programming with residents and business owners in the area who may discover a release or be asked to shelter-in-place or evacuate.

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Suggested Agenda

Introduction	25 minutes
Hazard Recognition	30 minutes
Health Hazard Recognition	15 minutes
Actions and Activities during Release	20 minutes
Summary	15 minutes
Closing	10 minutes

NOTE: Times can be adjusted if one or more fuels is not applicable to the participants

Introduction

Time Requirement: 25 minutes

Number of Instructors: 1 or more, consistent with ratio shown in the Minimum Criteria

Materials

- Registration materials
- Student materials (Participant Guide)
- Whiteboard, easel and easel paper, or chalkboard
- Markers or chalk
- Internet access

Objectives

Review the overall program content

- Fuel transport routes in or near your community
- Community hazards of fuels release
- Internet access
- Community response actions during a release
- Structure of the emergency response teams
- Consequences of delaying preparation for the unlikely

When participants complete this introduction, they will be better able to:

- Recognize where a release might occur
- List outcomes of a release in your community

Teaching Methods

- Presentation/discussion
- Group activity

Suggested Instructor Preparation

- Review Participant Guide, exercise and listed on-line resources to become familiar with local/regional releases.
- Review the contents of Reporting Releases programming available through the MWC. Some programs may wish to provide that program in addition to the Community Preparedness content.
- Identify modes of transportation in region where participants live/work
- Observe markings on rail and road transport vehicles and identify pipelines in the area. There is no central resource to know what goes through any local. You may discuss particular concerns with local responders to identify hazards that

they can share. Because of security, many transporters do not share the contents of shipments with the public.

- Test web links prior to the session and If any are inoperative please notify the Midwest Consortium at alrdilr@ucmail.uc.edu
- Prepare additional maps if time allows:
<http://www.eia.gov/state/maps.cfm?v=Petroleum>.
- Select a video for the exercise (see appendix to this Facilitator Guide)
- Review background of the incidents included in the Participant Guide; see appendix to this Facilitator Guide. (Share other examples with UC to be included in the program resources.)
- Prepare an outline for notes to be included in the program file
- Ensure that you have access to the resources
- Review the MWC website to ensure that access to the Participant Guide works; participants should be able to download it, and access the resource links directly.

Minimum Content Requirements

- Modes of transportation relevant to the participants
- Video exercise

Questions You May Be Asked

1. Participants might remark, "What is the town plan if there is a release?"

Acknowledge that you are not aware of the details. Facilitate a discussion about who in the town (responders and elected leaders) might be asked for details. Refer to the program Table of Contents to illustrate that this program is an introduction only.

2. "At a train derailment in the next state, they just let it burn out, so there is not really a problem as long as everyone stays away. Right?" Acknowledge the participant's suggestion to stay away as good practice. Then facilitate a discussion about any ways that hazards might be transported away from the initial crash site (water, air).

3. “Why can’t we know what is coming into the town/city?” Acknowledge the validity of the question and ask ‘Why might a shipper not want to publish the contents of containers?’. Be prepared to facilitate a discussion regarding (homeland) security. Note that during the program and in other MWC programs, participants can learn how to identify contents of specific shipment.

Presentation of the Session

This session can be presented as follows:

Review the objectives (overall and this Introduction).

Methods of Transportation and Routes

Refer to the Participant Guide

Turn to the page with rail maps. (note definition of PADD, established during WWII for rationing purposes.)

Ask: What does this indicate about this community and nearby areas?

Ask: Have you identified rail lines in or near town?

Turn the page to the pipeline map.

Ask: What does this pipeline map indicate about this community and nearby areas?

Ask: Have you identified pipelines in or near town?

Refer to the map on refining capability to illustrate why transportation by all methods is important in the Midwest. The number of refineries in MWC states: IL,4; IN, 2; KY, 2; MI, 1; MN, 2; ND, 2; OH, 4; TN, 1; WI, 1. (see: <http://www.eia.gov/petroleum/refinerycapacity/table2.pdf>) accessed February 22, 2017. To accommodate the high production capacity and low refining capacity, long-distance, high-volume transport is required.

Ask the summary Question: What can happen....

Write down any responses where all can see, then turn the page for examples. Check off the responses from participants as the examples are reviewed.

Casselton train derailment

Ask: What do you note here?

Large fire

Remote

Ask: Do you think this was an isolated event?

Bring to everyone's attention the last paragraph of Mr. Rogness's comments showing that US DOT estimates 200 derailments in the 20-year period 2014-2033.

Turn the page to view a photo of Lac-Megantic, Quebec, where a major part of the business district was consumed by fire.

Next page shows

Smoke near a residence during the Galena IL derailment

Booms on Kalamazoo River to contain oil

Next page shows a release from the Belle Fourche Pipeline, ND

Note the limits of this program, shown at the bottom of the page.

Exercise – Video of a Release and Discussion

Show the video you have selected and facilitate a group discussion to answer the questions shown.

It is likely that some participants will not know if the community is ready, or to what extent. These are expected responses. The program is not designed to ensure that this is answered 'yes' at the end of the session, but participants may have better questions to help them determine status of preparedness. As residents, they are not empowered to effect policy, but can become better prepared to ask questions and interpret the responses. Some communities may have worked to prepare the responders, but participants may be unaware of this. Regional mutual aid agreements may be in place for response and medical assistance, for example.

Hazard Recognition

Time Requirement: 30 minutes

Number of Instructors: 1 or more, consistent with ratio shown in the

Minimum Criteria

Materials

- Student materials (Participant Guide)
- Whiteboard, easel and easel paper, or chalkboard
- Markers or chalk
- Internet access

Section Objectives

When participants complete this section, they will be better able to:

- Recognize hazards and terms associated with fuels and fuel releases
- Recognize specific hazards associated with ethanol, Bakken crude and petroleum oil
- List potential hazards of fuels that may be transported through your community

Teaching Methods

- Presentation/discussion
- Small Group or Group activity

Suggested Instructor Preparation

- Review Participant Guide, exercise and listed on-line resources to become familiar with hazards of local/regional releases
- Test web links prior to the session and If any are inoperative please notify the Midwest Consortium at alerdilr@ucmail.uc.edu
- Review ERG sections on rail cars and pipelines
- Develop ethanol maps for locale, if appropriate
- Print relevant SDSs to use as examples

Ethanol <https://tsocorpsite.files.wordpress.com/2014/08/ethanol-and-gas.pdf>

Bakken crude <http://www.conocophillips.com/sustainable-development/Documents/2014.05.30%20825378%20Bakken%20Crude%20Oil,%20Sweat.pdf>

Petroleum oil https://www.hess.com/docs/eu-safety-data-sheets/crudeoilsweet_eu.pdf?sfvrsn=2

<https://www.marathonpetroleum.com/brand/content/documents/mpc/sds/0257MAR019.pdf> (Canadian tar sands oil)

- Review HazCom
- Prepare an outline for notes to be included in the program file

Minimum Content Requirements

- Background and Terminology
- Information sources
- Hazards of releases
- Exercise

Questions You May Be Asked

1. Participants might remark, "It looks like you cannot tell one crude oil from another".

Review the DOT placards for each—the participant is correct.

"So how do we know the dangers?" Facilitate a discussion of reasons that knowing would be good (then responders would know the contents) and that it could result in higher danger (some folks might initiate an intentional release). In a release, you might be able to get close enough to read placards. For pipelines, the markings include the owner and contact information. An oil pipeline for transport will be marked 'petroleum' and if high in sulfur with hazard of hydrogen sulfide will be marked 'poison gas'. If the pipeline is underground, the pipeline marker is an indication that there is one in the area, but the depth and exact location are not shown. Public information is shown at <https://www.npms.phmsa.dot.gov/>, including name of operator, contact address and phone number. Further information can be requested as shown at the website.

2. "How do I get one of those DOT manuals?". Indicate how to access the electronic versions, and to get hard copy refer to internet.

Presentation of the Session

This session can be presented as follows:

Review the objectives.

A large amount of material is shown in the Participant Guide. As a facilitator, some decision will need to be made regarding what to cover in depth, and what to point to as a reference/resource. Considerations include:

- Fuels transported in the area
- Fixed site storage and processing facilities in the area
- Surface water

Some guidance is given for each topic, below.

Introduction

Background and Terminology

Refer to the Participant Guide

Turn to the page ethanol information. If ethanol is not relevant to your group, summarize briefly and move to the next fuel.

As appropriate, show a map you created of production facilities using the link provided.

Emphasize that ethanol is usually transported by rail or barge

Formulations and how each is named are shown

Review the hazard considerations

Ask: who is familiar with OSHA? Perhaps a participant will offer some reason for knowing about OSHA.

Ask: how do OSHA, EPA and DOT regulations apply to ethanol production?

This is an opportunity to differentiate workplace exposure, workplace emissions to the general population, transportation. If barges are a potential shipping method in the region, reference the US Coast Guard.

Ask: what happens to ethanol spilled on water?

Ask: what happens to ethanol spilled on land?

Ask: has anyone heard of BTEX (BeeTEX)? Repeat what the acronym means. Benzene is a carcinogen.

Refer to the section on Bakken crude

Very high production, and flammable.

Refer to the Casselton, Lac-Magentic and Galena photos above.

Ask: 'Have you heard this referred to as 'light crude'? Link the term to higher flammability than petroleum oil (Canada or Gulf Coast)

Refer to the section on Petroleum crude from Canada or the Gulf Coast

Omit details if no sources in the area

Some crude moves north and south, as noted.

Refer to the Kalamazoo River spill as one example.

Ask: 'Have you seen bird and shoreline cleanup photos after an oil spill?'

This is likely the heavier crude that is less flammable.

Information Sources

Three basic sources of information are detailed here.

SDS

Ask: Have you used a Safety Data Sheet or a Material Safety Data Sheet?

If MSDS is more familiar to participants, review that the 'M' has been dropped in an update to Hazard Communication Training, 29CFR1910.1200.

If participants are unfamiliar with HazCom, write the CFR where all can see; the following link to the Quick Cards may be useful:

<https://www.osha.gov/dsg/hazcom/SDSItems.html>.

Emergency Response Plan/Emergency Response Action Plan and other plans

A listing of required plans is shown. If participants are not in an area of a fixed-site storage/transfer facility, cover this briefly as and suggest it as a resource should it be needed in the future.

If there is a fixed site facility, review the scope of plans that are required by various agencies. These are generally only available to employees and emergency response personnel. However, each contains information that might be useful for community-wide planning.

Note that training drills are required.

Signage and direct observation

Refer to the photos in the Participant Guide

Van Hook is a storage and loading facility.

Ask: What is important content in this posting?

Emergency contact, chemical (note Benzene is the B in BTEX), H₂S

The next photo shows

Underground petroleum pipeline in New Town, ND

The next page shows

Storage tanks and (very tiny, but long) rail cars

Train yard in Minneapolis

Ask: what different concerns do you have if you live in New Town vs. Minneapolis?

The next page shows placard on a rail car and other markings that are useful (but may not be visible in a derailment).

Turn the page to see the DOT placard identifiers for the fuels covered in this program.

Ask: What do you notice here for ethanol? (lots of placard numbers)

Ask: What do you notice here for crude oil? (same number)

Hazards of Releases

Ask: What happens when a liquid is released to the ground?

List responses. If no one mentions release underground, add that as described in the Participant Guide.

Ask: what do you predict will happen if there is a spark or other source of ignition?

Ask: What are some sources of sparks in a derailment or truck mishap?

Ask: what could be the source of a spark where there is a pipeline breach?

Example: farm equipment

Exercise – Hazard Assessment

During this exercise participants will work in small groups to summarize information for their area, as shown in the table.

Participants should describe a release they believe is possible, list the fuel and populations affected and then discuss what can be done to reduce the risk by each person in the group. For example, it is important to stop at rail crossings, never dig if there is a pipeline in the area, perhaps set up a plan to check on a neighbor who is in a wheel chair, etc.

In this exercise, focus on what the participants can do—regardless of what the local government and emergency agencies have done (and much may not be known by the participants).

Facilitate a report-back.

It may be useful to have a map of the area to aid in identifying what areas of the community might be affected during a specific scenario. For example, if there was a burning fuel fire at the intersection of Road A and Highway T with a strong westerly wind....how many homes, businesses, and what area of land might be impacted?

Health Hazard Recognition

Time Requirement: 15 minutes

Number of Instructors: 1 or more, consistent with ratio shown in the
Minimum Criteria

Materials

- Student materials (Participant Guide)
- Whiteboard, easel and easel paper, or chalkboard
- Markers or chalk
- Internet access

Section Objectives

When participants complete this section, they will be better able to:

- List potential exposures from each fuel
- Identify health effects of possible exposures

Teaching Methods

- Presentation/discussion

Suggested Instructor Preparation

- Review Participant Guide and listed on-line resources to become familiar with effects of ambient exposure
- Test web links prior to the session and If any are inoperative please notify the Midwest Consortium at alerdilr@ucmail.uc.edu
- Print fact sheets (e.g., New Jersey Fact Sheets) for fuel components and fuels
- Prepare an outline for notes to be included in the program file

Minimum Content Requirements

- Table of exposures for each fuel
- Fact sheets as resource for more information
- Particle exposure hazards from fuel fires

Questions You May Be Asked

1. Participants might remark, "I don't get why EPA has 24-hour, multi-day averaging. That doesn't have much relevance to these fires, does it?"

Review the mission of EPA: to protect over a lifetime.

The participant is correct that the averaging is not relevant. However, it is useful to have access to the values should measurements be done and reported to residents.

2. "Benzene is a carcinogen. Will I get cancer from walking on the ground that was saturated?"

Ask: what happens when a solvent is open to the air? Facilitate a discussion about vaporization of many of the components even after a short amount of time. And if the sun is on surfaces, there is heat from a fire or it is a hot day, the volatiles vaporize even more rapidly.

3. “So does anyone get close enough to the fire to measure particles?”

EPA is concerned with the public, so measurements are not made near the fire, but where people living.

Presentation of the Session

This session can be presented as follows:

Review the objectives.

Introduction

Refer to the Table. Refer to the meaning of VOCs and BTEX and examples of route of entry.

Underscore that hydrogen sulfide can kill quickly. It smells like rotten eggs when first encountered, but the ability to smell it is rapidly overcome and it may seem that there is no longer any exposure. **WRONG**. The hazard potential may remain.

Potential health effects of fuel components

Refer participants to the resources to learn more about health effects for each fuel.

Pass around copies of the fact sheets on each.

Potential effects of particle from a fuels fire

Ask: Does a fire add any other special hazards?

Facilitate a discussion of how you might be affected by ‘smoke’.

Refer participants to the text box regarding reporting symptoms to a health care provider.

Actions and Activities during a Release

Time Requirement: 20 minutes

Number of Instructors: 1 or more, consistent with ratio shown in the
Minimum Criteria

Materials

- Student materials (Participant Guide)
- Whiteboard, easel and easel paper, or chalkboard
- Markers or chalk
- Internet access

Objectives

When participants complete this section, they will be better able to:

- Describe the need for an alerting system for residents
- List reasons for an organized response command structure
- Describe the need for an evacuation plan for residents

Teaching Methods

- Presentation/discussion

Suggested Instructor Preparation

- Review Participant Guide and listed on-line resources to become familiar with effects of ambient exposure
- Test web links prior to the session and If any are inoperative please notify the Midwest Consortium at alerdilr@ucmail.uc.edu
- Identify who/agency to call if a release is identified by a resident
- Identify if there is an alerting system
- Identify if there is an evacuation plan
- Prepare an outline for notes to be included in the program file

Minimum Content Requirements

- List of what is at risk during a release
- Emergency recognition and alerting
- Incident Management System structure

Questions You May Be Asked

1. Participants might remark, "who do I ask to find out if we have an alerting system?"

Ask: is there a fire department in town or nearby?

Probably that is a good place to start.

2. “My child requires daily medical treatment at home for a lung disorder. How can I ensure that all of the equipment can get to the evacuation site?”

Some factors to consider in a discussion:

- Can child and equipment be carried in your vehicle?
- Is help needed to load/unload?
- Is special power supply needed?

Special needs should be planned in advance with health care provider.

Ask: Are there other special circumstances that require planning in the community?

Presentation of the Session

This session can be presented as follows:

Review the objectives.

Introduction

Refer to the listing of **What is at Risk during a release?**

Human Health and Safety is at the top of the list.

Responders always preserve life over property.

What are the community resources?

Refer to community resource list and note: Each resource list is specific to your community. It may be useful to consider also making a list of Special Circumstances (nursing homes, elderly, special medical needs of a resident).

Emergency recognition and alerting

In general, others will recognize or be informed that a release is occurring. But it is important to know how to alert officials of a possible event—such as oil in a farm field identified during tilling.

Ask: do you know who to call—is it 911 or 811 or...?

Ask: have you been notified of an alerting system?

Ask: is there evacuation plan(s) if a release occurs?

Be prepared to facilitate a discussion about how to find the answers in the community.

Discuss shelter-in-place as an alternative to evacuation.

Who is in charge: the Incident Command System

Turn to the illustration of an Incident Management System.

Note that the Incident Commander has overall responsibility.

Ask: what are the advantages of an organizational structure for a response?

Summary (15 minutes)

Facilitate a group discussion of the three questions.

Have you identified the fuels transported through the community?

Do you know how you will be alerted if there is a release (or will ask)?

What are the consequences of not preparing?

If an answer is 'no',

Ask: Do you have tools to find out?

Closing (10 minutes)

Review the learning objectives.

Remind participants that the Participant Guide can be accessed at <http://med.uc.edu/eh/academics/training/mwc> where the links can be used to access resources.

Ask: Based on this training, what takeaways do you have as prepare to assist in another community?

List them on a writing surface viewable by all

Answer any remaining questions.

Participants will complete the evaluation form.

Collect forms and thank all participants; provide certificate/documentation of training.

Thank everyone for their participation.

Facilitator Follow up

Make this program better:

Forward suggestions to UC

Are there other 'Questions you may be asked' that should be included?

Organize the listing of 'takeaways' and forward to your program director. These are very important impacts to report to NIEHS.

Appendix—Resources

Videos

ethanol train derailments—IL and OH

<http://guides.library.illinois.edu/c.php?g=348050&p=2346023>

oil train derailment—WV, ND, VA

<https://www.youtube.com/watch?v=6SuQqgMMHx0>

<http://www.kvrr.com/2017/02/07/new-video-released-in-casselton-train-derailment-of-2013/>

http://www.richmond.com/news/drone-video-lynchburg-va-train-derailment-www-eastcoastdrone-net/youtube_748daf12-d149-11e3-9e03-001a4bcf6878.html

<http://www.inforum.com/news/4213406-watch-feds-release-video-trains-fiery-2013-crash-near-casselton>

Other resources

DOT info

<https://hazmatonline.phmsa.dot.gov/IncidentReportsSearch/Welcome.aspx>

reader-friendly ethanol fact sheet

<https://teamster.org/sites/teamster.org/files/EthanolTransport.pdf>

timeline of Kalamazoo oil spill <https://www.epa.gov/enbridge-spill-michigan/enbridge-spill-response-timeline>

pipeline breach photos

<http://www.cnn.com/2016/12/12/pipeline-spills-176000-gallons-of-crude-into-creek-about-150-miles-from-dakota-access-protest-camp.html>

<http://www.ctvnews.ca/canada/pipeline-breach-southeast-of-regina-leaks-200-000-litres-of-crude-oil-1.3253587>

https://article.wn.com/view/2016/10/19/Landowners_to_court_Exxon_Mobil_pipeline_breaches_contract/