



16- Hour Industrial Emergency Response

Large-volume fuels release

Facilitator Guide

Acknowledgments

The Midwest Consortium developed this course for Hazardous Waste Worker Training under cooperative agreement number U45 ES 06184 from the National Institute of Environmental Health Sciences.

The Midwest Consortium gratefully acknowledges the contributions of the following in program development and review: CARS, Minneapolis, BioUrja, and the United Brotherhood of Teamsters.

We encourage you to comment on these materials. Please share any comments with your Program Director.

Warning

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Disclaimer

The Occupational Safety and Health Administration (OSHA) rule to help assure 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 builds on the operations-level program to increase the preparedness planning and response to a release of fuels transported by road, rail or pipeline.

Additional training is necessary to perform many activities. These activities include performing control actions (technician-level skills) and using specialized monitoring instruments. For information about additional training, consult the training facilitator, appropriate emergency plans, or your company health and safety representative.

Content updated on June 26, 2023. All web links are active as of February 11, 2021; if you find an error, please inform the facilitator so that it can be updated.

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OVERVIEW

Time Requirement: 1 hour

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

Materials

- Whiteboard or equivalent; markers
- Sign-in sheets
- Registration Materials (if not collected prior to the course)
- Participant Guides
- Handouts, if used
- Course Agenda

Section Objectives

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

- Identify routes and methods of transportation
- Identify the types of releases that have occurred

Teaching Methods

- Presentation
- Discussion

Suggested Instructor Preparation

- Review the Participant Guide for this program and relevant parts of the Operations-level Participant Guide
- Review the HAZWOPER standard
- Develop regional examples to add to the Overview (see appendix for resources). Place a copy of any added material in the Program File.

Presentation of the Session

This session can be presented as follows:

1. Welcome the class.
 - Trainees can be welcomed by an employer, union representative, fire chief or similar person in support of the program if it is held on-site
 - Have participants sign in
 - Explain why the program was created, and reference HAZWOPER
2. Introduce the program presenters:
 - The training institution conducting the training
 - The Midwest Consortium
 - The instructors who are present

3. Introduce the trainees

- As appropriate, ask the trainees to introduce themselves to the class. Have them briefly tell their name, where they are from, their experience with hazardous materials, why they are taking the class and how they will use this training.

Turn to the Wall Street Journal excerpt in the text box and review with participants. This underscores the text on the previous page of the Participant Guide:

Incidents and emergencies are inevitable-- never planned and will always occur unexpectedly. An incident can create tunnel vision and confusion if you are not properly trained and prepared and this can negatively impact human health and result in long lasting health effects and even potential fatalities. Don't let this happen.

Protect yourself first, be prepared, allow the response system to work

Challenges of a Fuels Release during Transport

Ask participants to turn to the maps in the Participant Guide.

Ask: what do you observe from the rail map?

Ask: are there hazardous liquid lines running through your locale?

Ask: which major shipping routes impact your region?

Note that you can make more detailed maps of the region, as needed.

Turn to the US Refinery Capacity map.

Ask: does this map illustrate why transportation is a major activity in the Midwest?

Then

Ask: what are some of the outcomes of transportation?

Make a list where participants can see it.

Continue with a review of the pictures that follow.

Fire

Release to Water and Land

Note that produced water is not a fuel, but a byproduct that is transported in high volume and may be released to land (as shown) or water.

Ask participants to take a couple of minutes to review the Summary shown, taken from remarks made by the Cass County ND emergency manager regarding the Casselton train derailment.

Facilitate a discussion:

What were the hazards?

Do any surprise you?

What is your opinion of the DOT forecast of incidents in next 20 years?

Is there risk where you live/work?

INSERT HERE: any local examples you have developed using resources in the Resource Appendix.

What is the Emergency Responder Preparedness Planning for high-volume fuel release program?

Describe the program activities, following the listing in the Participant Guide.

Present the overall goals of the class, which are to learn about:

- Potential releases in your community
- Hazard recognition
- Health hazards
- Work practices
- Monitoring equipment procedures and use
- Personal Protective Equipment for a fuels release

When participants finish, they will be better able to do the following:

- Assess the hazards of a release
 - Work within a system set up for response actions
 - Perform assigned response actions through termination
-
- Go through the agenda
 - Explain training policies (e.g., smoking, breaks, phone policies, etc.)
 - Collect medical release forms (required if wearing SCBAs) if not done previously or documented by the employer (e.g., fire chief may sign off that annual physicals have been performed and participant is cleared for training)
 - Explain that evaluation and documenting feedback is an important part of training—for continuous improvement and for continued funding

EMERGENCY RESPONSE

Time Requirement: 1 hour

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

Materials

- Whiteboard or equivalent; markers
- Participant Manuals
- 29 CFR 1910.120 (no longer an appendix; prepare copies as handout)
- Other course resource materials
- Handouts

Section Objectives

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

- Describe some topics that should be covered in the ERP for a potential release impacting your community
- Describe the Incident Command System (ICS)
- Describe Unified Command
- Identify some Standard Operating Procedures (SOPs) that may be referenced in an ERP

Teaching Methods

- Presentation
- Discussion

Suggested Instructor Preparation

- Review the Participant Guide for this program and relevant parts of the Operations-level Participant Guide
- Review the HAZWOPER standard

Minimum Content Requirements

The following are minimum content objectives for Emergency Response module:

- Overview of volumes of fuels that are relevant to the group
- Contrast extent of damage potential from a fuels release with a 'regular emergency
- Response Plan(s)
- Incident Command

- Communication/Alerting
- Zones

Questions you may be asked

- Trainees may point out that no ER plan is available, or they do not know there is one. This impression may be a result of incomplete training by the employer or be an apparent violation of 1910.120. The trainer must be ready to facilitate the discussion to determine if a plan does exist and how to obtain a copy for information and/or review. For contract programs, plant personnel responsible for the ERP should be identified. For general admission programs, it may be up to the employee to investigate further.
- In the case of contract programs where the employer's ERP is known to be inadequate, the instructor should be comfortable directing a discussion of approaches to problem resolution.
- Trainees may recognize that previous work may have resulted in exposure to hazardous materials because of inappropriate PPE or assignments in zones for which the workers were not properly protected. These individuals should be referred to the union representative or occupational physician.

Presentation of the Session

This session can be presented as follows:

Introduction

Response to this type of emergency may include personnel from multiple states/jurisdictions, multiple agencies and multiple employers/companies.

As appropriate for the group of participants, review the various fuels:

Ethanol – and formulation designations

Bakken crude (light or sweet)

Petroleum crude (heavy or sour)

NOTE: To increase interaction, the following three questions could be presented as a small group activity. The participants in each group could then compare the listing with what is in the Participant Guide, leading the others through the appropriate list.

Ask: what is at risk if one of these fuels is released?

Make a list and then compare with those listed in the Participant Guide.

Ask: what makes a fuels release different from a 'regular emergency'?

Ask: what needs to be taken into consideration while preparing for a fuels emergency?

NOTE: If there are omissions from any of the three lists, provide that information to your Program Director.

Information in a Response Plan

Emergency responders at the operations level are trained to respond in a defensive fashion without actually trying to stop the release. Their function is to confine the release from a safe distance, keep it from spreading, and prevent exposures. These and other activities are described in a Plan. Periodic review and practice of the elements in the plan are useful in assuring that responders know what to do, and can do it safely.

This section outlines several of the critical parts of a Plan.

Ask: What is in your Emergency Response plan?

Or

What should be in an Emergency Response Plan?

Make a list where all can see and discuss why each is important.

Incident Command System

The Incident Command System was developed to improve coordination and communication between different emergency response agencies following a devastating 1970 wildfire in California. It can be adapted to a large or small emergency.

Facilitate a discussion about why an organized response is required to protect health and property.

Ask: who has worked under ICS for a fuels release?

Review the jobs/duties as shown in the Participant Guide. Note that in the National Incident Management System (NIMS) from the Federal Emergency Management Agency (FEMA), roles are called functions.

Ask: who has worked in a response with multiple jurisdictions/agencies?

Introduce Unified Command. See the note in the Participant Guide regarding the command structure for the Casselton response.

Working with participants, develop a list of groups that might be brought into a Unified Command in their area.

Ask: where could UC be set up?

Ask: who would have initial jurisdiction?

Ask: how would pre-planning and drills facilitate operations?

Communication/Alerting

Ask for each mode of transportation: (train, pipeline, truck)

What is the procedure to report a release if it is from a _____?

If the procedure for one or more release type is unknown, facilitate a discussion of where to obtain the information.

Are there 'dead zones' where cell phones do not work?

On-scene communication

Ask : why is the buddy system used?

Ask : what communication systems have you used ?

Make a list

Discuss the advantages and disadvantages (example: line of sight may not be useful due to vegetation or topography)

Review the three basic hand signals shown in the Participant Guide.

Initial Actions

The initial siting of the command post sets the stage for the response. As shown in the Casselton experience, it may be moved, underscoring the need for adequate communication.

Zones

Operations-level responders are generally assigned to the Warm or Cold zones. Review the need for additional training for anyone who approaches the point of emission of a release (Technician-level activity).

Ask : what zones have you worked in ? and

what was the assigned task ?

Review the work done in each zone.

Summary—several important points are shown in the Participant Guide.

HAZARD RECOGNITION

Time Requirement: 1 ½ hours (30 minutes presentation/discussion; 60 minutes for exercises)

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

Materials

- Whiteboard or equivalent; markers
- Participant Guide
- NIOSH Pocket Guide and other electronic resources, such as New Jersey Fact Sheets, CAMEO Chemicals, etc.
- Hazard Communication standard

Determine level of HazCom knowledge. If 2012 Hazard Communication Standard training is needed, the HCS2012 exercise may be used (<https://mwc.umn.edu>, see HazCom)

- Emergency Response Guidebook
- Blackboard, marker board or easel with paper.
- Safety data sheet (SDS) for one or more chemicals of interest

Section Objectives

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

- Recognize visual clues associated with fuels transportation
- Recognize specific hazards associated with ethanol, Bakkan crude, produced water and petroleum oil
- Use resources available to research hazards associated with potential releases that may affect your community

Teaching Methods

- Presentation/discussion
- Small-group activity

Suggested Instructor Preparation

- Review the participant manual
- Gather additional photos of local relevance
- Through reconnaissance, know name(s) of relevant plans; obtain if possible
- Obtain an example of relevant Shipping Paper, Way Bill, Train List or other written resources specific to local transportation
- Determine if anyone in the area receives Flow Reports; obtain if possible
- Gather resources to identify worst case and most probable release Hazard Assessment exercise
- Review the MWC IER Hazard Recognition section

Minimum Content Requirements

The following are minimum content objectives for the Hazard Recognition module:

- Array of pre-planning drills and documents--tailored to local needs
- Properties of fuels
- DOT markings for fuels transportation
- Fire/Explosion/Corrosivity
- Hazard assessment
- Operations-level activities

Questions you may be asked

1. What if I am assigned a task that I do not have the skills to accomplish safely?

Be prepared to return to the ICS diagram. Facilitate a discussion of who/how to alert that you are not qualified to do what has been asked.

2. What do I do if I am the first to arrive and all the truck markings are covered due to damage?

Facilitate a discussion of following an alerting plan for this occurrence. Not in the plan? What are alternatives?

Presentation of the Session

This session can be presented as follows:

Introduction

Emergency responders should become familiar with the Emergency Response plan, whatever the name (e.g., ERP, FRP).

Ask: What plans are in place for response?

Review Signs and Markings by turning to the Participant Guide photos.

Use the DOT Guidebook (hard copy or electronic to identify contents.

Review Water and Surface indications of release

Review image of Work Activity

Review image of Vegetation Damage—link to prior image of produced water truck release.

Consider special situations:

Clouds/plumes visible

Winter conditions

Inclines

Other materials in the shipment (Train List)

Written Sources of Information

Show examples of Way Bill, Train List, Shipping Papers as appropriate.

Fire and Explosion Hazards

Turn to the Participant Guide and review the definitions of

Explosive Limits

Explosive Range

BLEVE

Corrosivity

Ask: is produced water just water?

Review the corrosive nature of produced water and the toxic compounds that may be in this by-product, such as metals (arsenic, lead), organics (benzene, benzo(a)pyrene, pentachlorophenol, heptachlor). Some of these compounds are absorbed through the skin.

Ask: What is the effect on vegetation of a produced water spill? (refer back to photo, as needed)

Exercise - Hazard Assessment

30 minutes, including report back discussion.

Introduce the exercise, to be completed in small groups or a single group depending on class size and the range of potential scenarios. For example, in some areas, one group might work on releases from trucks and another on releases from trains. In an area where there is only a pipeline, the entire group may work on the assessment.

Facilitate a conversation of 'special considerations' (weather, medical, access, staffing, communication.....). This may identify areas not considered in the relevant plan.

Exercise – Operations-level activities

Continue with the best format for the group—small group or entire group.

30 minutes, including report back discussion.

This exercise will result in a list of operations-level activities (based on ICS) for the hazard(s) identified. Be prepared for a discussion of additional activities, or to identify why some listed activities might be Technician-level or Specialist assignments.

Summary—several important points are shown in the Participant Guide.

HEALTH HAZARD RECOGNITION

Time Requirement: 1 ½ hours (30 minutes for presentation/discussion; 60 minutes for exercises)
Number of Instructors: 1 or more, consistent with ratio in Minimum Criteria

Materials

- Whiteboard or equivalent; markers
- Masking tape
- Participant Manual
- Internet access or paper copies of resources

Section Objectives

Objectives for this section are:

- Use resources to identify health effects of identified hazards
- Discuss ways to protect your health
- Describe key requirements of medical surveillance

Suggested Instructor Preparation

- Read the Participant Guide
- Review the IER section on Health Hazard Recognition
- Prepare an outline to follow. Different groups will have different needs. It is better to respond to their concerns than to follow an outline rigidly.
- Refer back to the list of fuels in the Hazard Assessment exercise
- Review relevant resources; assure each is available for participant use
- Check electronics

Minimum Content Requirements

The following are minimum content requirements for this section:

- Hazardous components and Routes of Exposure
- Fire triangle
- Explosive limits
- Chemicals and the body
- Medical surveillance

Questions you may be asked

- Are the chemicals at work harming me? The instructor should be prepared to discuss work exposures in relation to other causes of major diseases, i.e. the many causes of lung cancer. The trainee should be referred to an occupational medicine clinic for detailed information. Specific references could also be discussed.
- How can I get exposures measured? Company and union resources should be discussed. Filing an HHE or OSHA complaint is a last resort.
- Can the results of medical surveillance be used to fine me? This is a common concern of workers. The instructor should be prepared to discuss union and OSHA avenues to resolve this concern.
- How do you know if a physician specializes in occupational medicine? Few physicians are “occ docs”. Be prepared to give the names or locations of “occ docs” in your area.
- Can urine collected for a required chemical analysis be used for a drug screen? Instructors should be aware of company practices. Refer trainee to their union or management representative.

Presentation of the Session

This session can be presented as follows:

Introduction

Ask participants to turn to the table that shows fuels, hazardous compounds and route(s) of exposure.

Review the contents. Explain the terms VOCs and BTEX.

Ask: When you want to find out what a term means, where do you look?

Demonstrate or show paper copies of the resources for each hazardous component.

NOTE: these resources will be used in the exercise.

Ask: who has been at a response where there was a plume of smoke or vapors that traveled away from the release? (this could be in the air or on water).

Introduce the concept of resident exposure limits, and contrast it to worker exposures. The residents include very young, very old, and disabled in contrast to working populations. Also, exposure can occur for 24 hours, 365 days per year. Therefore the values are much lower.

Illustrate with Benzene: PEL=1 ppm; RfC=0.0094 ppm.

As appropriate, access the HAPs. Note that there are resources to guide residents when there is a chemical release.

Turn to the illustration of the particle plume. Review the particle sizes, as described by EPA.

As appropriate, review the Particle Pollution standards.

Exercise - Health Effects

Work in small groups to research health effects using information from the Hazard Assessment. Divide the hazardous components of interest among the groups. Allow 30 minutes to use resources.

Facilitate a report back. If multiple groups found information on the same hazard and it is not consistent, be prepared to review the sources and discuss differences.

Facilitate a discussion of exposure avoidance or reduction for each exposure. List responses and post where participants can see. Return to this in Work Practices.

Medical Surveillance

Key points:

HAZWOPER requires medical surveillance for certain groups of workers exposed to hazardous materials during emergency response.

Employers are required to pay for required medical exams.

The employer must keep records of medical exams and exposure monitoring until 30 years after the worker's employment ends.

The employee should report all work-related injuries and illnesses immediately.

Summary—several important points are shown in the Participant Guide.

MONITORING

Time Requirement: 1 hour (more if the second exercise is conducted)

Number of Instructors: 1 (2 if the second exercise is conducted)

Materials

- Whiteboard or equivalent; markers
- Table
- Participant Guide
- Examples of monitoring instruments

Section Objectives

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

- Identify some types of monitoring equipment that may be used at an emergency response for a fuels release
- Demonstrate use of available monitoring equipment for expected exposure scenario(s), as appropriate for your role

Teaching Methods

- Presentation
- Demonstration
- Small-group or group activity

Suggested Instructor Preparation

- Review the Monitoring section in the Participant Guide
- Review the MWC Exposure Monitoring Participant and Facilitator Guides
- Be prepared to supplement this manual with participant-specific instrumentation information
- Assemble monitoring equipment for demonstration
- Review OSHA standard 1910.1000, Air Contaminants, where PELs are listed
- Review employer SOPs for monitoring and confined-space entry
- Prepare lesson plan
- Review manufacturer's information and instructions for use, maintenance, and storage of equipment used during module

Minimum Content Requirements

- Uses of monitoring equipment
- Demonstrations of available equipment
- Monitoring at an emergency response
- Monitoring device selection exercise

Questions You May Be Asked

1. You should be prepared to discuss safe confined-space entry (CSE) procedures. Be prepared to describe the actions an employee may take if directed to enter a space which she/he feels is unsafe. For contract programs, the CSE program should be reviewed prior to presenting this module. For open enrollment, general approaches of working through union or company health and safety officers should be discussed. You must be aware of the consequences of refusal to work. Ask participants what CSE training they have received. Just as with ER, what you are trained to do dictates what you can do regarding confined spaces.

2. Trainees may question whether adequate monitoring is done on a routine and emergency basis. For contract programs, reconnaissance will provide you with information about the facility/operation monitoring program and equipment.
3. Access to monitoring information may be a new concept for many individuals. How to request this information and what to do with it (keep it with personal medical records, provide it to private or union occupational medical doctor) should be discussed.
4. Participants may ask how to think about a short, high exposure compared with the 8-hour TWA. Be prepared to discuss C and STEL values and how to average a short exposure over longer times. Similarly, some responses may involve exposures longer than 8 hours. An illustration of how to calculate what would be allowed for a responder working 12 hours or 24 hours may be useful.

Presentation of the Session

This session can be presented as follows:

Sampling

Ask: "Why would you want to monitor in a response?" List responses where the whole class can see them. Be prepared to fill in any gaps not mentioned. Refer back to the list generated at the beginning of the class and to examples in the participant manual.

Ask: "When would you want to monitor?"

Ask: "How are the results of these (refer to the list) reported?"

Refer to the Participant Guide to list the types of instruments most often used in responses. Underscore the cautions in the box.

For any group where one or more participants will be conducting sampling, review the 'Before sampling...' list.

NOTE: Highlight experience from Cass County relating to monitoring and the problem of cold temperatures.

And the Special Considerations that follow.

Monitoring tools and instruments

Discuss the features of several instruments commonly used in hazardous waste site work, and demonstrate them and/or pass them around the class. Some examples might include:

- pH paper
- Oxygen meter, Combustible-gas indicator (CGI), combination instruments
- Length-of-stain tubes or colorimetric tubes
- Personal alarm
- Photoionization Detectors
- Flame Ionization Detectors
- Particulate Monitors

Information is included in the Participant Guide for each of these instruments. Use as appropriate for the group.

Exercise - Monitoring

From the information in the Hazard Assessment, the group (or small groups as appropriate) will select monitoring equipment to provide needed information for decision making throughout the response.

Facilitate a discussion.

Exercise - Demonstrate use of Monitoring Device

If monitoring is a task of the group, select an instrument they will use and create and exercise to detect or measure, following templates in the MWC IER (<https://mwc.umn.edu>, see Emergency Response → 24-hour Industrial Emergency Response) or the Monitoring program (<https://mwc.umn.edu> → Exposure Monitoring). Use or modify an existing Performance Checklist

Summary - several important points are shown in the Participant Guide.

WORK PRACTICES

Time Requirement: Presentation – 30 minutes
 Workshops – 1 hour

Number of Instructors: 1; 1:5 instructor:participant ratio during work practice

Materials

- Whiteboard or equivalent; markers
- Table
- Participant Guide
- Open-space room which will allow groups mobility with protective equipment
- Four tables set up as stations
- Chemical protective clothing (CPC)
- Duct tape (Tape recommended by the manufacturer should be used in the field.)
- Assemble supplies on task list

Section Objectives

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

- Identify specific work practices that may be needed when doing operations-level activities at a response scenario described in the Hazard Assessment.

- Demonstrate ability to accomplish one work practice, working in a team

Teaching Methods

- Presentation
- Demonstration
- Small-group activity

Suggested Instructor Preparation

- Read the Work Practices section in the Participant Guide
- Determine the work practices that will be used as skill demonstration; prepare checklists as needed
- Review exercises and activities
- Review manufacturer's information and instructions for equipment used during module
- Assemble supplies and equipment for work practice demonstration
- Review relevant SOPs/SOGs

Minimum Content Requirements

- Hierarchy of controls
- SOPs and their importance to emergency response
- Operations-level Activities
- SOGs, as appropriate for the activities
- Emergency Response Equipment and Supplies
- Workshop
- Equipment and supplies for an operations-level activity

- Hands-on demonstration

Questions you may be asked

Trainees may state that particular SOPs are lacking at their work despite relevant ongoing activities. The instructor must be ready to facilitate discussion of how to determine if an SOP exists, how to obtain a copy within the union/management structure and approaches to problem resolution.

Trainees who will only receive the operations-level training may ask what they should do if they are expected to perform response activities beyond their level of training. The instructor should be prepared to emphasize the training requirements of 1910.120 and facilitate a discussion of problem resolution within the union/management structure. For contract programs, the instructor should be familiar with the company ERP and if the situation exists where employees will perform duties beyond their level of training the instructor should have previously discussed the situation with management.

Presentation of the Session

This session can be presented as follows:

Hierarchy of Controls

Emphasize that PPE is the last line of defense against hazards. Under the hierarchy of controls, from most preferable to least preferable:

- Eliminate
- Substitute
- Modify
- Contain
- Ventilate
- Work Practice Change
- PPE

Ask participants about PPE use in previous responses, and if any of the responses involved high volumes of a fuel.

Ask: What part of the Hierarchy of Controls is illustrated by...?

Keep adsorbents from losing the contaminant through evaporation (Contain)

Confined Space work (Ventilate)

Fire suppression (Contain)

Return to the list of 'exposure reduction methods' from Health Hazard Recognition Exercise.

Ask: for each of these methods, where does it fall on the hierarchy of controls?

SOPs for Emergency Response

NOTE: distinguish between SOP and SOG

You should be familiar with the ERP before an emergency occurs. As an operations-level first responder, you should respond in a "defensive fashion without actually trying to stop a release." The purpose of the response is to protect nearby persons, property or the environment from the effects of the release.

Activities at the operations level are generally grouped as confinement, and other support activities away from the emission source. Review confinement approaches shown in the Participant Guide

Ask: who has done(insert a confinement task)?

The Participant guide includes SOGs or description for the following:

- Work on lakes, rivers, ponds and lagoons
- Confined space Entry
- Lock-out
- Fire Prevention
- Evacuation
- Shelter-in-Place
- Decontamination
- Emergency Medical Treatment and First Aid
- Termination Procedures
- Post-response Critique and Follow-up

Cover these as appropriate for the group. If additional SOGs/SOPs are appropriate, made note and add to the Program File.

Emergency Response Equipment and Supplies

The list shown in the Participant Guide is for training purposes only.

Ask: for the Hazard Assessment that describes a response you may participate in, what ...fill in from below...

- Communication gear
- Recordkeeping and related supplies
- Tools, supplies and equipment
- Monitoring and observation equipment
- Respiratory and PPE
- Resource and reference material...are required?

Ask: are all of these (...fill in from list...) available and ready to use?

Ask: if not used routinely, are these (...fill in from list...) on a schedule for inspection?

Workshop - Work Practices

Instructions for Workshop

This workshop is divided into two activities—develop a list and a demonstration. Minimal PPE is recommended only to prevent trainees from becoming excessively wet. Full PPE with respirator/SCBA may be used, but will require more time and create a time imbalance between the small group activity and the hands-on labs. A minimum of three instructors (if 15 participants; 1:5 ratio required) is needed to successfully present these activities.

NOTE: These activities may be modified to adjust for more “real-life” settings which may be anticipated based on the hazard assessment. In no instance should modifications be made which are beyond the scope of the operations level first responder.

Small Group Activity

Equipment and supply needs for an operations-level activity

Divide the group into teams that may perform a specific activity. Have the group complete the worksheet and prepare a report back.

Demonstration

Select appropriate tasks for each small group, based on the hazard assessment.

Equipment/supplies for several activities are shown below, and Performance Checklists are shown in the Participant Guide.

Diking and Absorbing

Gather Supplies

PPE

Splash suits

Gloves

Impervious boots

Face shield, depending on spill scenario

Equipment and Supplies

Spill liquid (non-toxic)

Absorbent materials (absorbent socks, clay chips, dirt/sand, cat litter, etc.)

Non-spark tools (shovel, scoop, pushbroom, etc.)

Waste drums

Performance checklist with clipboard and pens for each trainee

Organization

Assemble equipment and PPE

Prepare simulated spill (leaking drum, pipe, container, etc.)

Instructions

Teams should compare their list with those supplied; then assemble the necessary equipment from available supply and develop a strategy.

Team reviews strategy with instructor

Instructor and team members don PPE

Team approaches spill then dikes and absorbs spill in a manner which minimizes contact with the material.

Instructor critiques diking/absorbing.

Team discusses disposal of PPE/equipment.

Instructor reinforces concepts of decontamination and the fact that operations-level workers may not directly come into contact with spill or clean it up.

Team members complete performance checklists which are reviewed and initialed by the instructor.

Block the Flow

Gather Supplies

PPE

Splash suits

Gloves

Impervious boots

Face shield, depending on spill scenario

Spill liquid (non-toxic)

Blocking materials (carpet, plastic sheeting, garbage can cover, etc.)

Non-spark tools (shovel, scoop, push broom etc.)

Waste drums

Dirt or other weights

Performance checklist with clipboard and pen for each trainee

Organization

Assemble equipment and PPE

Prepare simulated spill (leaking drum, pipe, container etc.) with access to drain (self-contained drain).

Instructions

Team members should compare their list with those supplied; then assemble the necessary equipment from available supply and develop a strategy

Team reviews strategy with instructor

Instructor and team members don PPE

Team approaches spill then places blocking material over the drain until it is completely covered. The activity should be performed in a manner which minimizes contact with the material. Diking may also be done, as necessary.

Instructor critiques blocking and diking (if applicable) activities.

Team discusses disposal of PPE and equipment.

Instructor reinforces concepts of decontamination and need for identification of material.

Team members complete performance checklists that are reviewed and initialed by the instructor.

Decon

Gather Supplies

PPE

Splash suits

Gloves

Impervious boots

Face shield, depending on hazard

Spill liquid (non-toxic—chocolate syrup, shaving cream)

Items that are contaminated (tools, boots...)

Wash buckets

Scrapers

Brushes

Performance checklist with clipboard and pen for each trainee

Organization

Assemble equipment and PPE

Prepare contaminated supplies to be deconned.

Instructions

Teams members should compare their list with those supplied; then should assemble the necessary equipment from available supply and develop a strategy

Team reviews strategy with instructor

Instructor and team members don PPE

Team conducts decon.

Instructor critiques decon.

Team discusses disposal of PPE and equipment.

Instructor reinforces concepts of decontamination and need for identification of material.

Team members complete performance checklists that are reviewed and initialed by the instructor.

Termination and Critique

Gather Supplies

PPE

Splash suits

Gloves

Impervious boots

Face shield, depending on hazard

Wash buckets

Scrapers

Brushes

Container of boxes of gloves of various sizes

Container of Nomex gloves

Container of Boots

Container for splash suits—empty

Container for tape—half full

Container for boxes of disposal bags—some unopened, some smeared with dark
'stuff'

Deconned boots (some should show evidence of contamination)

Performance checklist with clipboard and pen for each trainee

Organization

Assemble equipment and PPE

Instructions

Teams members should compare their list with those supplied; then should assemble the necessary equipment from available supply and develop a strategy

Team reviews strategy with instructor

Instructor and team members don PPE

Team evaluates supplies.

Instructor critiques evaluation.

Team discusses needed actions.

Instructor reinforces concepts of reporting deficiencies so that remediation will result.

Team members complete performance checklists that are reviewed and initialed by the instructor.

Summary—several important points are shown in the Participant Guide.

CPC + RPE=PPE

Time Requirement: Presentation – ¼ hour
 Exercise – ¾ hour

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

Materials

- Whiteboard or equivalent; markers
- Participant Guide
- MWC IER Participant and Facilitator Guide
- NIOSH Pocket Guide (paper or electronic)
- ERG
- Glove charts

Section Objectives

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

- Identify appropriate PPE to be used during a scenario resulting from the hazard assessment

Teaching Methods

Presentation

Small group Activity

(If a review of RPE and CPC is required, follow the IER manual for program content: <https://mwc.umn.edu> see Emergency Response→ 24-hour Industrial Emergency Response)

Suggested Instructor Preparation

- Review the Hazard Assessment and set up an exposure scenario (location, volume, time of day, weather conditions) for a release.
- Post the details where everyone can see.
- Select tasks
- Develop expected answer for the scenario
- Assemble needed resources

Minimum Content Requirements

- Scenario
- Select PPE for various operations-level activities that are required

Questions You May Be Asked

1. "What about facial hair? My employer has a 'no beard' policy, and I don't like it."

Emphasize that facial hair prevents a good fit, resulting in exposure to toxic substances.

2. "What do I do when my employer gives me the wrong respirator and tells me that I've got to wear it or else?" Be prepared to facilitate a discussion on strategies to improve the company respiratory protection program through discussions with employee or management representatives. Emphasize that the law requires that employers provide adequate protection from respiratory hazards.

3. “I store my respirator in my truck.” Emphasize that anything that lands on your respirator when you’re not wearing it might be inhaled the next time you wear it.

Presentation of the Session

The session can be presented as follows:

Scenario

- Review that Respiratory Protective Equipment (RPE) and Chemical Protective Clothing (CPC) are included in Personal Protective Equipment (PPE)
- Describe the scenario.
- List selected tasks (these should require a range of PPE due to assignment)

Exercise - Select PPE

Break the participants into small groups and assign each one or two activities. Using resources, they will identify the needed PPE and describe the selection process and gear in a report back.

Summary—several important points are shown in the Participant Guide.

DISCUSSION

Time Requirement: Presentation – ¾ hour

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

Materials

- Whiteboard or equivalent; markers
- Participant Guide

Section Objectives

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

- Analyze aspects of a previous response

Teaching Methods

- Discussion

Suggested Instructor Preparation

- Read the Casselton report or substitute a local example (see Appendix).
- Prepare answers to questions Minimum Content Requirements

The following are minimum content objectives for the module:

- Case study review
- Discussion

Questions you may be asked

- Participants might remark. “What happens to the debris after a release”?

Ask participants to list the types of debris and then facilitate a discussion of handling and storage/disposal. Some time for investigation may delay removal and some ‘evidence’ may be moved to another site. Does this affect decon?

- Participants may also ask if they are dragging contaminants away from the site on boots and turnout gear. Instructors should use this opportunity to reinforce the need for proper decon to protect coworkers, family members and the community.

Presentation of the Session

This session can be presented as follows:

Case Study

Provide 15 minutes for participants to read the report and think about the questions.

Discussion

Facilitate a discussion guided by the questions:

What are 'lessons learned'?

What 'good luck' was involved?

Could the event have resulted in injury?

Was preplanning valuable?

Emergency Response Exercises

Time Requirement: Table top exercise and hands-on activities – 5 ½ hours

Number of Instructors: Maintain 1:5 ratio, facilitators to participants

Materials

- Chalkboard, marker board or easel with paper or whiteboard
- Markers
- Company ERP; or MWC 'For training only ERP'
- NIOSH Pocket Guides
- DOT Guidebooks
- Internet access if possible
- Open-space room which will allow groups mobility
- MWC Simulation Health and Safety Plan (or local plan)

Section Objectives

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

- Demonstrate ability to participate in a response
- Demonstrate ability to conduct the activities for an assigned role

Teaching Methods

- Discussion
- Small-group activity
- Hands-on

Suggested Instructor Preparation

- Read the Simulations section in the IER Participant and Facilitator Manual (<https://mwc.umn.edu> see Emergency Response→ 24-hour Industrial Emergency Response).
(Checklists and briefing papers may be useful resources.)

The exercise should include **First Alert, Planning that results in diverse activities, Response Actions, Decon, Termination and Critique**

- Prepare exercise, based on the Hazard Assessment.

Describe, develop a map and stimuli that reflect changing condition/information (for format see (<https://mwc.umn.edu> see Emergency Response→ 24-hour Industrial Emergency Response and <https://mwc.umn.edu> see Modular Refresher→ Design a Drill)

See also: <https://www.transcaer.com/transportation-rail-incident-preparedness-response>

- Assemble resources
 - PPE selection
 - SOPs/SOGs
 - Written, internet
- Collect supplies and equipment

- Review Health and Safety Plan for the conduct of a simulation (<https://mwc.umn.edu> see Site Workers→40-hour Site Worker Facilitator Guide)
- Review ERP or use generic MWC ERP (<https://mwc.umn.edu> see Emergency Response→Training Only ERP)

Minimum Content Requirements

- Table top or field exercise
- Critique of response plan and execution

Questions you may be asked

Trainers should be prepared to discuss variations on the incident. Trainees will undoubtedly ask, "What if...". Thorough trainer preparation for the many possibilities is very important.

Presentation of the Session

This session can be presented as follows:

Follow exercise as developed. Keep notes, especially during the Critique as participant identify what might have gone better and what they were very prepared for.

Put the Exercise in the Program File; revise/update as needed following the program and send to UC to share with other programs.

CLOSING AND PROGRAM EVALUATION

Time Requirement: ½ hour

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

Materials

The following materials will be needed:

- Chalkboard, marker board or easel with paper or whiteboard
- Markers
- Evaluation forms
- Certificates

Objectives

- Complete evaluation forms
- Answer questions
- Review need for additional training for technician level activities and the need for annual refresher
- Thank participants

Teaching Methods

- Discussion

Suggested Instructor Preparation

- Review any remaining questions raised during the program by participants.

Minimum Content Requirements

The following are minimum content requirements for the section:

- Evaluation forms
- Answer last questions
- Thank participants

Questions You May Be Asked

1. “What happens if I do not take a refresher?” If needed for a job, you will not be eligible. Some employers ‘stretch’ the requirement to 18 months, if the refresher is taken ASAP, but it is a gamble.
2. “What if there is no more training, but I have to plug/patch?”. Generally we find that employers provide the additional training, but if not, share the requirements with your supervisor. See the OSHA website for information regarding filing a complaint.

Presentation of the Session

Thank participants for attending the program.

This is an opportunity for final questions and to assure that the list of questions generated on day has been addressed during the program.

Evaluation is important to continued program improvement. This should not be rushed. Provide 10 minutes to complete the program evaluation forms.

Appendix

Local/regional information

Everything you ever wanted to know about rail cars and more

<https://www.aar.org/>

Introduction build a relevant local ‘story’ resources

Overview—old but true: <https://www.wsj.com/articles/how-to-transport-oil-more-safely-1442197722>. Sept 20, 2015

Dakota Access Pipeline

<https://dapipelinefacts.com/>

Rail

NTSB reports on derailments:

<https://www.nts.gov/investigations/AccidentReports/Pages/railroad.aspx>

<https://fas.org/sgp/crs/misc/R43390.pdf> (congressional report 2014)

<http://ethanolrfa.org/consumers/where-is-ethanol-made/>

statistics, by state: <http://safetydata.fra.dot.gov/officeofsafety/default.aspx>

<http://www.ishn.com/articles/106072-track-inspectors-play-crucial-role-in-safe-crude-transport>

Casselton ND derailment

http://www.nts.gov/investigations/pages/casselton_nd.aspx

<http://www.startribune.com/nts-400-000-gallons-of-crude-spilled-in-casselton-train-wreck/239948631/>

Alma WI derailment—ethanol

<http://dot111.info/2016/12/28/feds-operator-error-caused-2015-bnsf-derailment-at-alma/>

<http://www.startribune.com/more-than-18-000-gallons-of-ethanol-went-into-mississippi-after-train-derailment/343246062/>

why more oil than ethanol derailments:

<https://www.desmogblog.com/2016/09/15/why-do-oil-trains-derail-more-often-ethanol-trains>

<https://www.desmogblog.com/oil-rail-why-are-ethanol-trains-not-bomb-trains-too>
<https://www.desmogblog.com/2016/09/14/bomb-trains-what-can-we-learn-ethanol-improve-safety>

Cherry Valley IL--ethanol

<https://www.nts.gov/investigations/AccidentReports/Reports/RAR1201.pdf>

Tiskilawa IL—ethanol

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

Galena IL—Bakkan crude oil

<http://www.chicagotribune.com/ct-oil-train-new-data-met-20150403-story.html>

<http://www.npr.org/sections/thetwo-way/2015/03/07/391368331/derailed-oil-train-continues-to-burn-in-illinois>

Pipeline

Calif pipeline failure 2015

<http://www.independent.com/news/2017/may/18/oil-spill-lessons/>

Pipelines,by county

<https://www.npms.phmsa.dot.gov/PublicViewer/>

Pipelines by feedstock

<https://maps.nrel.gov/biofuels-atlas/#/?aL=QHCCU5%255Bv%255D%3Dt&bL=groad&cE=0&IR=0&mC=47.55984733956309%2C-95.855712890625&zL=8>

failures ruptures

https://en.wikipedia.org/wiki/List_of_pipeline_accidents_in_the_United_States_in_the_21st_century

<http://www.phmsa.dot.gov/pipeline/library/reports/pipeline-failure-investigation-reports>

<http://www.ishn.com/articles/106064-pipelines-are-safe-despite-worn-away-covering-say-operators>

IL—diesel fuel

http://primis.phmsa.dot.gov/comm/reports/enforce/documents/220165003H/220165003H_Corrective%20Action%20Order_04222016.pdf

MI—crude from Canada tar sands

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

<http://michiganradio.org/term/kalamazoo-river-oil-spill>

<http://www.ecowatch.com/5-years-since-massive-tar-sands-oil-spill-kalamazoo-river-still-not-cl-1882075674.html>

ND—crude

<http://boingboing.net/2016/12/13/north-dakota-pipeline-ruptures.html>

<https://www.theguardian.com/us-news/2016/dec/12/oil-spill-pipeline-north-dakota-standing-rock-belle-fourche>

<http://www.ishn.com/articles/106070-the-new-mentality-no-job-is-so-urgent-to-do-unsafely>

http://www.willistonherald.com/news/faulty-weld-behind-dakota-access-leak/article_d4ab2cac-41ae-11e7-a8c0-9f4516391147.html

ND—salt water

http://www.nytimes.com/2015/01/23/us/north-dakota-pipeline-rupture-spills-3-million-gallons-of-saltwater.html?_r=0

<https://energy.usgs.gov/EnvironmentalAspects/EnvironmentalAspectsofEnergyProductionandUse/ProducedWaters.aspx#3822349-data>

<https://energy.usgs.gov/EnvironmentalAspects/EnvironmentalAspectsofEnergyProductionandUse/ProducedWaters.aspx#3822110-overview>

ND—all pipeline spills

http://www.nytimes.com/interactive/2014/11/23/us/north-dakota-oil-boom-downside.html?_r=0

MN—gas

<http://www.twincities.com/2014/05/25/northwestern-minnesota-gas-pipeline-explosion-it-was-just-hell-on-earth/>

MN—oil

<https://www.nts.gov/investigations/AccidentReports/Pages/PAR0401.aspx>

MN evacuation checklist

<https://dps.mn.gov/divisions/hsem/weather-awareness-preparedness/Documents/KMR%20Evacuation%20Checklist%202015.pdf>

Roadway

<http://america.aljazeera.com/watch/shows/fault-lines/articles/2015/1/12/traffic-accidentsanunwantedconsequenceofthebakkenoilboom.html>

<http://www.ishn.com/articles/106061-hauling-oil-and-gas-one-of-the-most-dangerous-jobs>

Emergency Response

See the Unified Command Facilitator Guide at the Clearinghouse Curricula Listing under WMD modules

Health Hazards

New Jersey Fact Sheets: <https://web.doh.state.nj.us/rtkhsfs/factsheets.aspx>

Light crude:

https://www.cdc.gov/nceh/oil_spill/docs/Light_Crude_Oil_and_Your_Health.pdf

Produced water: Durant, B et al. Assessing dermal exposure risk to workers from flowback water during shale gas hydraulic fracturing activity. J Nat Gas Sci Eng (2016) 34:696-978

Ethanol

<http://www.mass.gov/eopss/docs/dfs/emergencyresponse/special-ops/ethanol-spill-impacts-and-response-7-11.pdf>

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

Monitoring

<http://www.mass.gov/eopss/docs/dfs/emergencyresponse/special-ops/ethanol-spill-impacts-and-response-7-11.pdf>