Objective #7	**Response Personnel Safety**	Demonstrate, or discuss in a tabletop exercise, the ability to protect emergency personnel health and safety.

A Basic Intent

The intent is to ensure response personnel are not placed in a hazardous situation without proper equipment, training, and procedures to safely work on-scene. To implement this, the command structure will need to ensure access to the immediate hazard is controlled. They need to identify the hazards and provide the proper protective clothing for personnel to control the released materials. Finally, they need to ensure a decontamination process is in-place to protect those who were exposed to the hazards. The importance of this Objective is reflected in OSHA's emergency response standard (29 CFR 1910.120), as adopted by Public Employee Risk Reduction Program (PERRP), Ohio Hazmat TAC and the NFPA's recommended practices for hazardous materials events (NFPA 471, 472, 473, and 1600).

B Discussing the *Points of Review*

1. *Were proper procedures and/or guidelines followed so the arrival at the scene did not expose or contaminate personnel to the on-scene hazards?*

As the first piece of equipment arrives on-scene, responders should recognize that chemicals are involved. If the initial notification includes information about the hazards, dispatchers should provide this information as they mobilize responders. Vehicles should cautiously approach a known Hazmat scene and stop at a safe distance. No response actions should be taken until the hazards are assessed.

2. *Was a Safety Officer clearly identified and effectively in control of site safety?*

OSHA requires a Safety Officer be designated for each Hazmat incident. OSHA notes that the Safety Officer is responsible to recognize when personnel are in imminent danger and must take action to alter, suspend, or terminate those activities. The IC may elect to act as the Safety Officer for small incidents, but should delegate this function for large or complex scenarios. The IC needs to ensure personnel on-scene know who the Safety Officer is. This person will need to work closely with the Operations Officer and those who will work within the hazard area.

3. *Were hazard zones clearly defined and effectively controlled to ensure no one entered a restricted zone without the proper personal protective equipment (PPE)?*

OSHA notes that the number of responders working at the site, particularly in those areas of potential or actual exposure to the hazards, should be limited. To facilitate this process, the use of control zones is recommended to limit access. This typically involves three zones and they go by a number of names. They are the Hot or Exclusion, the Warm or Contamination Reduction, and the Cold or Support zones. To be effective, responders must establish and define these zones at the beginning of the response. Responders may use flags, cones, or barrier tape to define each zone. A formal process must be in-place to ensure personnel do not move between the zones without the appropriate personal protective equipment (PPE). The Safety, Decon, Operations, or Hazmat Team officers control access. Personnel should be directed to proceed through clearly defined checkpoints. This will ensure personnel do not enter the zones inadvertently and they are decontaminated as they re-enter the cold zone.

4. *Was an appropriate level of PPE chosen and issued to personnel who were properly trained*

to use the equipment?

OSHA requires that personnel have the appropriate PPE, which includes SCBA if an inhalation hazard is present. The personnel responsible for ICS safety and operations positions need to consult with the spiller, the shipping papers, SDS, technical guidance or local plans/procedures to determine what PPE is appropriate. PPE is divided into four categories (A, B, C, D), and the appropriate level depends on the hazard and the work location. The NFPA 471 standard addresses what type of PPE should be used. The IC should know responders' level of training and ability to work in the hazard zones. If not, personnel should be queried so that someone is not assigned a function if they are not properly trained. The NFPA 472 standard notes that personnel with Operations Level training are qualified to don PPE, work in a defensive function, and doff PPE. Technician Level training permits the use of specialized PPE and to perform more technical offensive actions

5. *Were personnel, to include arriving mutual aid resources, adequately briefed on the hazards, PPE requirements, and expected response actions?*

Personnel must be briefed on the physical and health hazards before beginning a response action. They should understand their expected work function (rescue, containment, decontamination, etc.). The briefing should stress to make minimal contact with the materials and to use the "buddy-system" while in the hazard zones. This briefing may occur when the resource arrives at the staging location, or by the Safety Officer in conjunction with the Operations Chief or Hazmat Team. In either case, command personnel must ensure personnel are fully briefed on their tasks and with whom they coordinate their activities. Arriving personnel should inform the IC as to what tasks they are *not* equipped or trained to accomplish.

6. *Were proper methods followed to <u>safely</u> control and stabilize the released materials (i.e. use a team approach, use spark-free tools, minimize contact, etc.)?*

Once the product is identified, appropriate techniques should be employed safely to secure the scene. Response techniques such as laying booms, building dikes, or applying neutralizing agents should be accomplished with little or no contact with the spilled liquids and solids. Also, equipment and tools should be "spark-free" if the released materials present a flammable hazard. When over-packing or up-righting a drum, the "buddy-system" should be used to minimize injury and exposures. Confined space may be a problem if entering boxcars or tractor-trailers, and steps must be in-place to recover personnel if they become entrapped. Also since personnel will be covered in PPE, they will need to monitor how long they are in protective suits or using SCBA. They must watch each other for signs of exhaustion, heat stress, or low air supplies, and then evacuate the scene before rescue is needed.

7. *Was adequate medical monitoring provided for hot and warm zone personnel to include providing rehabilitation and debriefing on the hazards?*

Typically, an EMS unit will be assigned to support entry and operations personnel. EMS personnel will initially complete baseline checks on entry members and then check them as they leave each zone. EMS needs to provide entry and decon members a suitable rest and rehab system. NFPA's 471 notes that this should include medical evaluation and treatment, food and fluid replacement, and relief from climatic conditions. Fatigue or heat exhaustion will likely be the greatest hazard. They should also check responders for signs of exposure and any reaction to the materials after they leave the hazard zones. Before concluding operations, EMS personnel

should brief Responders regarding long-term signs of exposure. For additional information, review NFPA's 473 standard as it outlines what training EMS personnel should have for working at a Hazmat scene.

8. Were back-up teams identified and readily available to support entry personnel?

The IC must ensure personnel are available and properly suited as "back-ups" for those working in the hazard zones. These personnel should not be accomplishing other duties, and should be in a position to immediately dress and enter the hazard area. They may be needed to rescue a responder in a hazard zone or be used to replace workers. Also, the IC, Ops or Safety Officer should have a schedule developed to replace decontamination personnel.

9. Were procedures followed to safely account for and track all response personnel on-scene?

This system should have the ability to identify what personnel are engaged in which response functions. It should note what members are in the hazard zones and how long they have been in those areas. The system should also have the ability to immediately notify and evacuate personnel from where an imminent hazard exists, and then account for those persons once they are clear of the scene.

10. Was an effective means of communications utilized between the IC, Safety Officer, decontamination personnel, and entry personnel to safely conduct operations?

There should be a clearly established means of communications between those in the hazard zones and back to the cold zone. This can be accomplished through specialized communication sets or the use of department radios on a dedicated/tactical channel. As a backup, personnel should have an understood set of visual and verbal signals. An emergency evacuation signal should also be briefed or understood.

11. Was an established process used to decontaminate personnel and their equipment?

The IC must identify the most effective means to remove and contain the contaminant. The process can be the physical removal of the chemical (washing, vacuuming, or absorption). It can also be the chemical reduction of the hazard (degrade, neutralize, disinfect, solidify). Also, an emergency or gross decontamination can be used to support an immediate rescue or removal from a hazard zone. Personnel should also have a defined method to remove contaminants. Personnel should also understand how or if a secondary contamination hazard exists. NFPA's 471 standard discusses this topic in detail.

12. Were contaminated wastes controlled and properly held for later disposal?

Personnel must identify what items could not be decontaminated. In this case, equipment must be disposed of and subsequently replaced. Ensure personnel give mechanical or electrical equipment a thorough inspection to determine its ability to return to service. Those materials that cannot be decontaminated must be collected and contained for proper disposal. Over-pack drums may be used to contain the materials. If in doubt, responders should consult the spiller, a cleanup contractor, or OEPA on how to properly handle these materials.

13. Were records kept to document the key response operations?

Command staff should have a running record that outlines the key response operations that were implemented to include any safety related items. Operations personnel should note what PPE was issued, what decontamination was done, and what safety issues arose. Documentation

is used to ensure actions have been implemented or to identify what additional actions may still be needed. After the event, the documentation will be used to improve procedures or to resolve a liability issue.

14. Were the actions taken based on existing plans and/or operating procedures?

NFPA's 471 standard notes that an emergency plan should outline these safety procedures in accordance with OSHA's requirements. OSHA allows departments to use the LEPC's plan if it addresses these issues. The LEPC plan must contain this information or it will rely on the individual departments' procedures and/or guidelines.

C Exercise Design and Control Issues

The Exercise Design Team needs to ensure that the hazard scenario and scene present a realistic incident. There should be sufficient clues and /or visual aids present to allow responders to identify the hazards. It should allow personnel to fully implement their response and safety procedures, and demonstrate their ability to protect responders from the hazards posed by the scenario.

For Tabletop exercises, the Exercise Design Team and Controller should have a fully-scripted scenario. The Controller will outline the spill in increments so responders can address their response functions. The Controller can also use an overhead projector or computer presentation to illustrate the scene and spill. Players should also be briefed to bring any research guides and reference materials that they would normally have on-scene.

For Functional and Full-Scale exercises, the scene should be setup to closely resemble a real spill. This includes leaking drums, dispersed powders, burnt containers, etc. Aids may also include items such as a smoke generator to simulate a toxic gas cloud or use of a colored-water to simulate a corrosive liquid. Exercise Controllers should also be available to provide verbal descriptions of the scene to responders so they clearly understand what the scenario is and react properly to the scenario.

Next, the Exercise Design Team needs to discuss what actions will be taken should a Player disregard a safety issue or their action results in an unsafe situation. First if the action would cause an ***actual*** injury (two people carrying a backboard when four are required), the Controllers must obviously stop and correct the event. Evaluators should also be briefed to watch for and prevent unsafe actions. The issue should be quickly corrected, debriefed, and the exercise should be continued. Second if the action poses a ***simulated*** hazard (a Player approaches a simulated airborne hazard without SCBA or puts finger into simulated corrosive liquid), the Controllers may wish to make that Player a new victim. The Player would be debriefed on why the action was unsafe and then would be made be a victim needing rescue/treatment. Or, the Controllers can simply make a mental note of the event and then debrief the action after the exercise.

Finally, Controllers may choose to suspend some portion of the exercise play in the interest of time or safety. For example, limited class B training suits may be available for the exercise. In this case, Controllers may allow a few Players to initially suit up and demonstrate they know how to properly don and work in the PPE. Controllers can then allow Players to remove the gear and continue the exercise with simulated PPE.

Overall, allowing too much simulation often hampers this Objective. Simulation does not demonstrate that personnel can safely implement these procedures. Nor does it allow personnel

to receive valuable hands-on training. The Exercise Design Team should ensure there is ample time, equipment, and personnel to fully demonstrate this Objective.

D Evaluation Needs and Issues

The Evaluator for this Objective needs to have a working knowledge in response safety. The person may be a Hazmat Team member, a Facility safety supervisor, or a trained First Responder. The person should be trained at least to the Operations level and preferably to the Technician level. They should also understand OSHA's and NFPA's requirements in regards to site safety.

In conducting the evaluation, the Evaluator should shadow the Safety and Operations officers. The Evaluator should also observe how a Hazmat Team interacts with the local response system. Also, the Evaluator should follow entry and decontamination personnel as they move in and out of the hazard zones. The goal is to see that personnel are thinking about the hazards before committing themselves to a response action. The best action may just be to do nothing. The Evaluator may need to query various Players to see if they have received information about the health hazards, what are the contamination hazards, what PPE is required, and what actions should be taken to prevent unwanted exposures to the materials.

This Objective can be evaluated along with Objectives #2 or 14.