

DECONTAMINATION PROCEDURES

COURSE OUTLINE

- **For most people, hygiene is an important social practice... not a matter of life and death. When you work with hazardous materials, however, staying "clean" means not becoming contaminated.**
- **Working safely with hazardous materials requires four major elements:**
 - Work practices.
 - Engineering controls.
 - Personal protective equipment (PPE).
 - Decontamination.
- **"Work practices" are methods for isolating workers from dangerous chemicals, such as spraying water on hazardous dust to keep it from becoming airborne.**
- **"Engineering controls" are devices for protecting people from hazardous materials. These include:**
 - Robotic equipment used for handling hazardous materials.
 - Large ventilation fans designed to remove toxic fumes from work areas.
- **"Personal protective equipment" is a blanket term for anything you wear that protects you from contamination and physical injuries, including:**
 - Chemical protective clothing (CPC).
 - Respirators.
 - Hard hats.
 - Face shields.
 - Work boots.
- **These elements work together to protect you from hazardous materials.**
 - But without decontamination you could still end up being exposed.
- **"Decontamination" means removing hazardous substances from your PPE and other equipment... or changing these materials into a harmless form.**
 - Without decontamination, your PPE could become saturated with the very same chemicals that you need protection from.
 - In time, this might present more of a hazard to you than your worksite does.

- **To prevent these unsafe residues from contaminating anyone, the OSHA HAZWOPER Standard made decontamination procedures mandatory at all sites where workers might be exposed to hazardous substances.**
- **The HAZWOPER (Hazardous Waste Operations and Emergency Response) regulations:**
 - Spell out the basics of decontamination.
 - Describe decontamination procedures that apply to all hazardous materials activities no matter where they take place.
- **HAZWOPER requires that access to any contaminated area be tightly restricted, whether it is:**
 - A Superfund site.
 - A place where a chemical incident has occurred.
- **These locations are so dangerous that no one is permitted to enter them without authorization and the appropriate PPE.**
 - That is why they are called "exclusion zones."
 - Most people are excluded from them for their own safety.
- **If certain questions about an exclusion zone can be answered, determining the decontamination procedures that should be used at the location becomes a much easier task. These questions include:**
 - What hazardous materials are present?
 - What are their concentrations?
 - Where is most of the contamination located?
 - What sort of work needs to be done within the zone?
- **Other questions include:**
 - What level of PPE is required to work in the zone?
 - How much traffic will move into and out of the zone during an average day?
 - Which decontamination methods are the most effective under these conditions?
- **Once all the questions about the exclusion zone have been answered, your site safety and health officer will design and implement the decontamination procedures that will be most effective in the situation.**

- **The site safety and health officer is the person in your organization who has the ultimate authority over how decontamination should be carried out.**
 - They will be able to answer any question you might have about how decontamination procedures are put into effect.
- **The conditions in the area just outside the exclusion zone are of as much concern as the conditions inside the zone.**
 - This space is called the "contamination reduction zone."
 - It is the part of the site that acts as a barrier between the exclusion zone and the outside world.
 - The sole function of the contamination reduction zone is to keep people from straying into or out of the exclusion zone.
- **A narrow strip of ground called the "contamination reduction corridor" stretches across the contamination reduction zone.**
 - Think of this as a one-way bridge from the exclusion zone to the outside world.
 - Everyone who has entered the exclusion zone must exit through this "CRC."
 - There are no exceptions allowed.
- **It is within the CRC that all decontamination activities occur.**
 - At one end, workers enter the CRC from the exclusion zone, wearing contaminated PPE and carrying contaminated tools.
 - At the other end, workers come out of the corridor decontaminated and ready to resume their normal activities.
 - Confining decontamination activities to this limited area effectively "bottles-up" contaminants and keeps them from "traveling" away from the exclusion zone.
- **Inside a CRC there are a number of stations, which are arranged in a row.**
 - At each of these, a specific piece of equipment is cleaned or left behind for later decontamination.
- **Any personnel who work in a CRC must wear PPE that is one level below that of exclusion zone workers.**
 - For example, if an exclusion zone worker must wear Level A PPE, the staff in the CRC would need to wear Level B PPE.

- **Most of the decontamination equipment that CRC workers use is far from exotic.**
 - Large galvanized wash tubs or children's wading pools hold decontamination solutions.
 - Soft-bristled scrub brushes, usually with long handles, are used to wash down the PPE.
- **A combination of water and detergent is the most common decontamination solution.**
 - It is versatile and is often used when you are dealing with unknown chemicals.
 - This is because water is the "universal solvent"... it will wash away almost anything.
- **For a small number of contaminants, however, a detergent and water solution might not be effective.**
 - Some materials actually react with water.
 - In these cases, special decontamination chemicals that transform the hazardous materials into harmless substances are used.
 - This process is called "neutralization."
 - Remember to be careful with these decontamination chemicals.
 - You can't use them as casually as you would detergent and water.
- **Applying the wrong solution may cause a dangerous chemical reaction, such as:**
 - Corrosion.
 - The release of hazardous vapors.
- **To avoid any problems, contaminants must be identified before a decontamination chemical is used on them.**
 - Often, a chemist will need to be consulted to determine which decontamination solution is best.
- **Now that we've reviewed the basics of decontamination, let's take a walk down a typical contamination reduction corridor. We'll assume that you're in Level A PPE.**
- **The first station you will reach is the "equipment drop".**
 - Here, you will place any tools that you have been carrying on plastic drop-cloths... to be removed for decontamination at a later time.

- **The "outer suit wash" is next in line.**
 - At this station, you step into a small pool and an assistant sprays your totally-encapsulating chemical protective suit with water.
 - Your suit is then thoroughly scrubbed with a detergent and water solution.
- **This is followed by the "outer suit rinse."**
 - You step into a second small pool and an assistant rinses your totally-encapsulating suit... spraying downward from head to toe.
 - This washes the contaminants from the suit into the pool.
- **You must be pay especially close attention when your boots are being rinsed.**
 - Once your first boot is rinsed off, you need to place that foot outside of the rinse pool.
 - Be careful... placing a rinsed boot back into the pool will recontaminate the boot!
 - Once the second boot is rinsed, you can step out of the pool completely.
- **Next, you will sit down on a bench.**
 - A decontamination assistant unzips the top of your totally-encapsulating suit, then peels it away from your body (down as far as your waist).
 - The suit must be turned to the outside while it is being peeled off of your upper body (to prevent any residual contamination on the outside of the suit from coming into contact with you).
- **After this, you turn off your air supply and detach your respirator hose.**
 - The assistant removes your air tank and puts it in a designated area, where it will be cleaned off.
 - Then the assistant removes the rest of your totally-encapsulating suit, which is placed in a special container for decontamination.
- **Next, your respirator facepiece is removed, followed by your SCBA tank harness.**
 - These are also placed in containers for later decontamination.
- **You then move to a second bench where an assistant helps you out of your inner suit.**
 - This will be bagged for proper disposal.
 - You are now at the end of the contamination reduction corridor, in your street clothes.

- **Immediately after you have gone through the CRC, you must receive a medical surveillance examination.**
 - This will allow your company's medical staff to determine the state of your health right after you come out of the exclusion zone.
 - Information from your medical surveillance exam will go into your permanent medical record, so that it can be compared to data from other exams you are given while working with hazardous materials.
- **Once your exam is completed, you must take a shower as quickly as possible.**
 - If no shower is available on site, wash your hands and face.
 - Then take a shower as soon as you get home.
- **"Washing off" is important for two reasons.**
 - First, there is a slight chance that a minute quantity of contamination may have reached your skin during the later stages of decontamination.
 - Showering with lots of soap will wash this off.
 - Second, wearing PPE makes you hot and sweaty.
 - For hygiene purposes as well as for health reasons, you need to get rid of this perspiration residue as soon as possible after leaving the CRC.
- **This "orderly" process of decontamination can become complicated if someone is injured or develops medical problems while on site.**
 - In some cases, normal decontamination might aggravate these conditions.
 - Whenever immediate, life-saving first aid or medical treatment is required, decontamination procedures should be skipped.
- **Depending on the type of substances involved, the victim may have to be transported in a company vehicle to prevent an ambulance from becoming contaminated.**
 - Personnel from the work site need to go to the hospital with the victim, to advise the medical staff about any decontamination that may eventually be needed.
 - At the hospital, the work site personnel should also let the emergency room staff know what chemicals the victim has been exposed to, as well as the potential health effects of these substances, if known.

- **If you ever have to provide information to a doctor or other medical professional, only tell them what you absolutely know to be true!**
 - If you do not know something, don't guess!
 - Only "hard," reliable information should be used when someone's life depends on it.
- **To work safely around hazardous materials, you need to use good work practices, engineering controls and personal protective equipment.**
 - But these alone are not enough to keep you safe.
- **Decontamination is also necessary.**
 - Without it, you can become seriously ill... and even spread contamination to those around you.

*** * *SUMMARY* * ***

- **Any contaminated area is called an "exclusion zone."**
 - When you leave an exclusion zone, you must exit through the "contamination reduction corridor".
- **Inside this CRC, you move through a number of stations, where your chemical protective clothing and equipment are cleaned... or removed for later decontamination.**
- **Your site safety and health officer will make sure that the decontamination procedures used in your CRC are correct.**
- **You must receive a medical surveillance exam immediately after leaving the CRC.**
- **You should then shower or wash off as soon as possible.**
- **But if someone needs prompt medical care for a serious injury or life-threatening condition, you should:**
 - Skip the decontamination procedures and get the victim to the hospital as quickly as possible.
 - Make sure that everyone involved is made aware of potential contamination issues.
- **Without decontamination procedures, you could carry hazardous chemicals along with you and not even realize it!**
- **Decontamination allows you to leave hazardous substances where they belong... so that you and your coworkers can go home safely!**