Session 4 Hazardous Waste Storage Units

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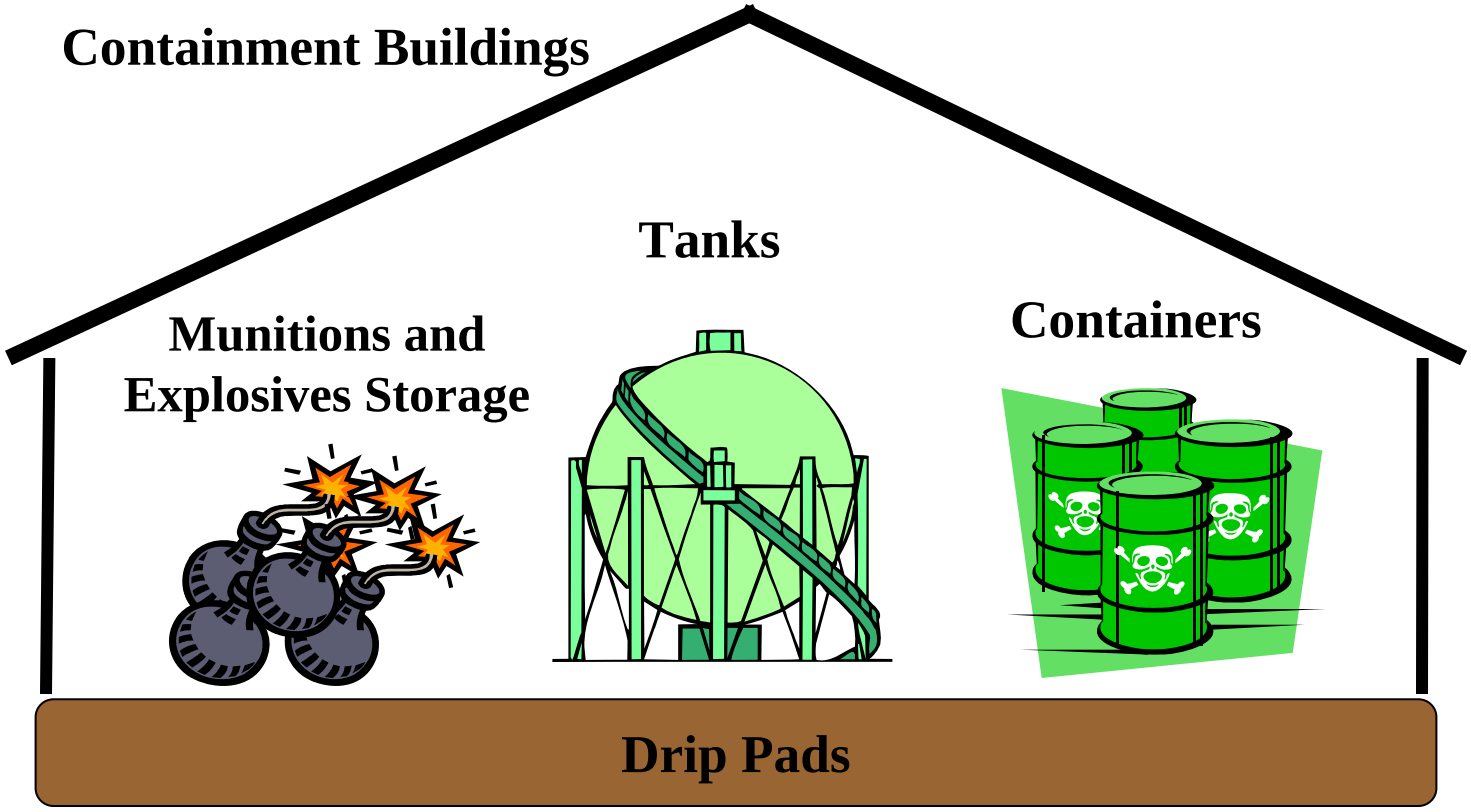
Session 4 Agenda:
Types of Hazardous Waste Storage Units

- Subpart I - Containers
- Subpart J - Tanks
- Subpart W – Drip Pads
- Subpart DD – Containment Buildings

- Subpart EE – Hazardous Waste Munitions and Explosives Storage

Hazardous Waste Storage Units



Subpart I - Containers

- Definition of Container
- Design Standards
- Operating Requirements
- Inspections
- Closure
- Empty Containers
- Air Emissions (discussed in Session 12)

Containers – Definition

- ". . . any portable device in which a material is stored, transported, treated, disposed of, or otherwise handled."
- Examples include: boxes, bags, drums, railcars, tanker trucks, roll-off boxes, test tubes, and vials
- Broad definition that encompasses all the different types of **portable** devices that may be used to handle hazardous waste

Containers – Design Standards

- Must be in good condition
  - Containers that are deteriorating (e.g., cracked, rusted) may not be used
  - Waste stored in defective containers must be transferred to containers in good condition
- Must be compatible with the waste
  - Containers must be made, of or lined with materials that will not react with the waste in the container
  - Incompatible wastes must not be placed in the same container
  - Appendix V in Part 264/265 provides a list of potentially incompatible wastes

Containers – Design Standards (cont.)

- Containment
  - Permitted container storage areas must have a **secondary containment** system
  - Secondary containment provides a backup system to prevent release into the environment should primary containment (i.e., the container) fail

    Example: sloped concrete pad or other impervious base with curbing and drainage to a sump, tank, or other container
  - Secondary containment system must be free of cracks, able to contain the spill, and emptied quickly

Containers – Operating Requirements

- Must be kept **closed**, except when adding or removing waste
- Must not be handled, opened, or stored in a manner that may cause them to leak
- Those holding ignitable or reactive wastes must be located at least 15 meters (50 feet) from the facility's property line

Containers – Inspection and Closure

- Inspections
  - Must be visually inspected at least **once a week** for leaking and deteriorating containers
- Closure
  - All hazardous waste and associated residues must be removed
  - Remaining containers, liners, bases, and soil contaminated with hazardous waste must be decontaminated or removed

Empty Containers

- Any hazardous waste remaining in either a RCRA empty container or inner liner is not subject to regulation
- A container or an inner liner removed from a container holding a **non-acute hazardous waste** if empty when:
  - All waste have been removed using practices commonly employed
  - No more than:
    - 2.5 cm (1 inch) of material remains in the container
    - 3% by weight remains for containers ≤ 119 gallons
    - 0.3% by weight remains for containers > 119 gallons

Empty Containers (cont.)

- Containers holding **compressed gases** are considered empty when the pressure in the container approaches atmospheric pressure

- A container or inner liner of a container holding **acutely hazardous waste** is empty when:
  - The liner is removed
  - The container is triple rinsed with an appropriate solvent
  - An approved alternate method is used

Subpart J - Tanks

- Definition of Tank
- Design Standards
- Containment
- Operating Requirements
- Inspections
- Release Response
- Closure
- Air Emissions (Session 12)

Tanks - Definition

- "… a **stationary** device, designed to contain an accumulation of hazardous waste which is constructed primarily of non-earthen materials which provides structural support"

- Examples include: Sums and USTs

Tanks – Design Standards

- System Integrity Assessment of **Existing Tank Systems**
  - Tanks in existence on or before July 14, 1986
  - Verify that the tank was designed and maintained to contain the wastes without failing, collapsing, or rupturing
- Installation of **New Tank Systems**
  - Must be inspected by an independent qualified expert prior to use to ensure that the tank was not damaged during installation.
  - Tanks and ancillary equipment must be tested to make sure there are no leaks; any leaks discovered must be fixed

Tanks – Design Standards (cont.)

- Corrosion Protection for **New Tank Systems**
  - New tanks made wholly or partly of metal must be designed and installed with adequate corrosion protection if the system will be in contact with soil or water
  - An owner or operator must develop a written design plan or assessment that accounts for site specific information such as soil moisture and acidity
  - The unit must have one or more of the following corrosion protection methods:
    - Corrosion-resistant construction materials (e.g., fiberglass)
    - Corrosion-resistant coating in combination with cathodic protection
    - Electrical isolation devices

Tanks - Containment

- Secondary containment systems must be designed, installed, and operated to ensure that:
  - No waste is released to the surrounding soil, groundwater, or surface water
  - Construction material or liners are compatible with the waste to be stored or treated in the tank
  - The tank is capable of containing accumulated material until it is promptly removed (generally within 48 hours)
  - The tank has sufficient strength to prevent failure, and
  - The foundation can resist failure due to normal movement of the surrounding soils (e.g., settlement, compression, or uplift)

Tanks – Containment (cont.)

- Tanks must be equipped with a **leak detection system** capable of detecting failure in either the primary or secondary containment structures
- The leak detection system must be able to detect failure in either the main tank or secondary containment system within 24 hours
- Commonly used detection devices include:
  - Thermal conductivity sensors
  - Electrical resistivity sensors
  - Vapor detectors

§§264/265.193(c)(3)

Tanks – Containment (cont.)

- Owners and operators must meet these secondary containment requirements by using one of the following devices:
  - An external liner that completely surrounds the unit with an impermeable material
  - A vault (the tank rests in an underground area usually constructed with concrete floors and walls and an impermeable cover)
  - A double-walled tank (or a “tank within a tank”)
  - An EPA-approved alternative design

Tanks – Operating Requirements

- Hazardous waste tanks must be operated in a manner that minimizes or eliminates releases
  - Chemicals that may cause any part of the tank's system to fail may not be placed in the unit
- Spills or overflows from the tank system must be prevented by using, at a minimum:
  - Spill prevention controls (e.g., check valves)
  - Overfill prevention controls (e.g., alarms and valve systems that automatically close when overfill is likely)
  - Sufficient room within an uncovered tank between the surface of the waste and top of the tank (i.e., minimum freeboard)

Tanks – Inspections

- Owners and operators must **inspect their tanks daily t**o verify hazardous waste tanks and components are operated and maintained in satisfactory condition
  - If a leak detection system is used to alert facility personnel to leaks, then **weekly inspections** are allowed
- Inspectors must thoroughly identify leaks, deterioration, corrosion, or structural fatigue in any portion of the tank or system components
- In addition to visual inspections, owners and operators must take into account data received from leak detection monitors and other tests

Tanks - Release Response

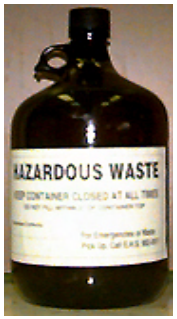
- A tank system, or secondary containment system from which there has been a leak or spill must be taken out of operation immediately
  - Stop the flow of waste into the tank
  - Inspect the system to determine the cause of the release
  - Remove any waste remaining in the tank within 24 hours
  - Remove and properly dispose of any contaminated media
- The owner or operator must notify the implementing agency, or the NRC, and submit a follow-up written report within 30 days

Tanks – Closure

- When possible, a storage or treatment tank must be “clean closed” by removing or decontaminating:
  - All waste residues
  - Contaminated containment system components
  - Contaminated soils
  - Contaminated structures and equipment
- If clean closure is not possible, an owner or operator can close the unit leaving contamination in place
  - Close as a landfill with waste in place

Containers vs. Tanks

- Containers
  - Mobile
  - Requires secondary containment only under Part 264
  - Empty container provisions
  - Closure
    - Remove hazardous waste residues and decontaminate structures



- Tanks
  - Not mobile; stationary
  - Requires secondary containment under Parts 264 and 265
  - No empty tank provisions
  - Closure
    - Clean close
    - Close as a landfill

Subpart W – Drip Pads

- Definition of Drip Pad
- Design Standards
- Operating Requirements
- Inspections
- Closure

Drip Pads – Definition

- " … an engineered structure consisting of a curbed, free-draining base, constructed of non-earthen materials and designed to convey preservative kick-back or drippage from treated wood, precipitation, and surface water run-on to an associated collection system at wood preserving plants"

- Drip pads are hazardous waste management units that are unique to the wood preserving industry
  - Used exclusively for the collection and temporary accumulation or storage of excess wood preservative prior to its removal from the unit
  - Regulated units will be found only at wood preserving facilities

Drip Pads – Definition (cont.)

Drip Pads – Design Standards

- Pad
  - Constructed of non-earthen materials (e.g., concrete, metal)
  - Provide sufficient structural strength to prevent unit failure
- Drip Pad Surface
  - Constructed with a raised berm around perimeter to prevent waste run-off into the environment
  - Sloped toward a liquid collection unit
  - Treated with impermeable sealers, coatings, or covers to meet specific permeability performance standards

§264.573(a) and §265.443(a)

Drip Pads – Design Standards (cont.)

- Liquid Collection System
  - Must allow removal of waste for proper management and to prevent overflow
  - Must include run-on and run-off controls as necessary
  - Subject to regulation as a hazardous waste tank
- Liner and Leak Detection System
  - Is not subject to specific permeability criteria
  - Must signal releases from the drip pad at the earliest practicable time
  - Structurally sound and chemically compatible

Drip Pads – Operating Standards

- Drip pads must be:
  - Free from cracks and show no signs of corrosion or other forms of deterioration
  - Cleaned frequently to allow for inspections of the entire drip pad surface without interference from accumulated wastes
- Drippage and precipitation must be emptied into a collection system as often as necessary to prevent waste from flowing over the curb around the perimeter of the unit
- Collection tanks must be emptied after storms to ensure that sufficient containment capacity is available for run-off

§264.573 and §265.443

Drip Pads – Inspections

- Newly installed or upgraded existing drip pads must be inspected to verify that the unit was properly constructed and that no damage occurred prior to use
  - An independent, qualified, registered, professional engineer must certify that the drip pad achieves all applicable design standards
- Drip pads must be **inspected weekly and after storms** to:
  - Ensure the pad and the liquid collection systems are functioning properly
  - Check for deterioration or leaks from the units

§264.574 and §265.444

Drip Pads – Closure

- Involves removal or decontamination of all associated waste residues, contaminated soils, and contaminated system components
- If all contaminated soils cannot be removed or decontaminated, the unit will be considered a landfill for purposes of closure

Subpart DD – Containment Buildings

- Definition of Containment Building
- Design Standards
- Operating Requirements
- Inspections
- Response to Releases
- Closure

Containment Building – Definition

- ". . . a hazardous waste management unit that is used to store or treat hazardous waste under the provisions of subpart DD of parts 264 or 265"

- Completely enclosed structure (i.e., four walls, roof, floor) that is used to store or treat **non-containerized** waste
  - Generally used for the management of hazardous waste debris and other bulky and high volume hazardous wastes not amenable to storage or treatment in tanks or containers
  - Can be used as secondary containment for wastes stored in containers or tanks

Containment Building – Definition (cont.)

Containment Building – Design Standards

- Building
  - Constructed of man-made materials
  - Provide sufficient structural strength to prevent unit failure
  - Completely enclosed (floor/walls/roof)
  - Have a decontamination area for personnel, equipment, and vehicles
- Doors/Windows
  - Placed so as not to come into contact with waste
  - Have dust controls to minimize fugitive emissions

Containment Building – Design Standards (cont.)

- Contact Surfaces
  - Chemically compatible with waste
- Primary Barrier (floor)
  - Constructed of man-made material (typically concrete)
  - Structurally sound
  - Chemically compatible with waste

Containment Building – Design Standards (if liquids are present)

- Primary barrier sloped toward liquid collection device
- Liquid collection system must allow for removal of waste for proper management
- Leak detection system must detect release of waste at earliest practicable time
- Secondary Barrier:
  - Structurally sound and chemically resistant to the waste
  - Must contain and allow for removal of accumulating wastes
  - Required **only for "wet areas"** within the unit

Containment Buildings – Operating Requirements

- Maintain the floor so that it is free of significant cracks, corrosion, or deterioration
- Repair or replace surface coatings or liners that are subject to wear from movement of waste, personnel, or equipment as often as needed
- Limit the height of wastes piled within the unit
- Maintain dust control devices at all openings to prevent emissions from the unit
- Provide a decontamination area within the building

Containment Buildings – Inspections

- Must be inspected **at least once every seven days**, with all activities and results recorded in the operating log
- Inspections involve:
  - Evaluating the units integrity
  - Assessing nearby soils and surface waters to detect any signs of waste release
  - Assessing information collected from monitoring and leak detection equipment

Containment Buildings – Release Response

- If a release is discovered, the owner or operator must:
  - Take the leaking portion of the unit out of service
  - Take all appropriate steps to repair the leak and contain the released waste
- Implementing agency must be notified of the discovery and the proposed schedule of repairs
- Upon completion of repairs and cleanup, a qualified, registered, professional engineer must verify that the facility has complied with the plan

§§264/265.1101(c)(3)

Containment Buildings – Closure

- Removal or decontamination of all associated waste residues, contaminated soils, and contaminated system components and equipment
  - Includes the inner and outer building walls, filters used in dust control systems, forklifts, and other vehicles used in the building
- If it is determined that not all contaminated soils can be removed or decontaminated, the unit will be considered a landfill for purposes of closure

Subpart EE – Munitions and Explosive Storage

- Military Munitions (40 CFR Part 266, Subpart M)
  - Definition of Military Munition
  - Military Munitions are Solid Wastes When …
  - Military Munitions Storage Standards
- Design and Operating Standards
- Closure

Military Munitions – Definition

- "Includes all types of both conventional and chemical ammunition products and their components; produced by or for the military for national defense and security" (62 FR 662; February 12, 1997)
- "Military" includes DOD, DOE, Coast Guard, National Guard, and parties acting as agents for DOD managing military munitions

Military munitions are solid waste when…

- Disposed of, burned, or incinerated
- Removed from storage for disposal
- Leaking, deteriorated, or damaged

- Determined to be solid waste by a military official
- Collected from a range and sent off site for treatment or disposal

Discharge of ammunition is a normal and expected use, not hazardous waste disposal

Military Munitions – Storage Standards

- Conditional exemption
  - Hazardous waste military munitions are subject to hazardous storage regulations, **except** when all of the conditions in §266.205(a)(1) are met
  - Chemical military munitions are **not exempt**
- Chemical military munitions are not subject to LDR storage prohibition of §268.50
- Hazardous waste storage units
  - Hazardous Waste Munitions and Explosives Storage (EE)
  - Containers (I)
  - Tanks (J)

Subpart EE - Design and Operating Standards

- Hazardous waste munitions and explosives storage units must be designed and operated with containment systems, controls, and monitoring, that:
  - Minimize the potential for detonation or other means of release of hazardous waste or constituents
  - Provide a primary barrier designed to contain the waste
  - Provide that the waste and containers will not be standing in precipitation (*for wastes stored outdoors)*
  - Provide a secondary containment system for liquid wastes
  - Provide monitoring and inspection procedures that assure the controls and containment systems are working as designed

Subpart EE - Design and Operating Standards (cont.)

- Hazardous waste munitions and explosives may be stored in one of the following:
  - Earth-covered magazines
  - Above-ground magazines
  - Outdoor or open storage areas
- Stored in accordance with a SOP specifying procedures to ensure safety, security, and environmental protection
- Packaged to ensure safety in handling and storage
- Inventoried at least annually

§§264/265.1201(b) and (c)

Subpart EE - Closure

- Removal or decontamination of all associated waste residues, contaminated soils, and contaminated system components and equipment
- If not all contaminated soils can be removed or decontaminated, the unit will be considered a landfill for purposes of closure

Session 4 – Review

- Subpart I - Containers
- Subpart J - Tanks
- Subpart W – Drip Pads
- Subpart DD – Containment Buildings
- Subpart EE – Hazardous Waste Munitions and Explosives Storage