# Let's Permeate Through Containment & Failure Analysis/Spill Prediction

## Fill-In Session M-G3

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## Introductions


### Uncle Steve

- 43 years (yikes!!) in multi-media environmental compliance (industry & consulting) – including ~ 30 years SPCC Plan development, implementation & auditing
- Developed & taught all 18 three-day APSA / SPCC Inspection Training classes for CUPA / PA inspectors/managers
- APSA Steering Committee and APSA Working Group participant
- NOT a regulator… just a goon consultant




## Legal Disclaimer

## Questions?

- We'll take 'em at any time
  - May need to defer to relevant section later in class or someone else's session
- Some stock answers you will hear:
  1. It's open to the CUPA's interpretation
  2. It depends
  3. It's still being decided
  4. It's up to the facility and their reviewing/certifying engineer
     - ✦ Alternate stock answer: Maybe… Was it certified in the Plan?
  5. Sounds like a call from the facility to their consultant is in order
  6. You're asking me that as if I know the answer
  7. Why do think this is all MY fault?



## Objectives

- To Review
  - Secondary containment requirements (with a ton of examples and issues) for all kinds of APSA-regulated things
    - ✦Tanks, containers, refuelers, stored tankers, OFE of any kind)
    - ✦Sized and general containment
  - Secondary containment inspections or monitoring and oil removal
  - Qualified Oil filled equipment… and the general containment impracticability allowance/alternative
    - ✦Again… with examples
  - Spill prediction/failure analysis
    - ✦ For all types of APSA facilities (QFs and PE-certified facilities)
    - ✦ Examples and calculation/estimation means



## CONTAINMENT

PREVENTING ESCAPE OF PROBLEMS SINCE 1790

## Helpful & Handy Reference

Uncle Steve's Tank / Container Summary Requirements Cheat Sheet For Tier I Qualified Facilities
(a brief summary of some (but NOT all) requirements)

| Term Used in U.S. EPA SPCC Rule | Term Used in APSA (see FAQ) | Containment Req'd. (40 CFR 112 rule ref.) | Inspections or Integrity Test Req'd? (40 CFR 112 rule ref.) | Other / Comment |
|---|---|---|---|---|
| Bulk containers (fixed/stationary) | Aboveground storage tank | Sized (100% capacity) containment + precipitation freeboard (112.6(a)(3)(ii)) | Regular inspections and frequent integrity testing (112.8(c)(6)). Must also test overfill prevention systems or procedure to ensure proper operation or efficacy (112.6(a)(3)(iii)). | Systems or written procedures for overfill prevention (112.6(a)(3)(iii)) Position to prevent nav. water discharge (112.6(a)(3)(ii)) |
| Portable/mobile bulk containers (except mobile refuelers & NTRTTs) | Aboveground storage tank | Sized (100% capacity) containment + precipitation freeboard (112.6(a)(3)(ii)) | | |
| Mobile refuelers & non-transportation- related tank trucks (NTRTTs) (A subcategory of portable/mobile bulk containers) | Aboveground storage tank | General containment (or other diversionary measures or equipment) (112.7(c)) | | |
| Oil-filled electrical equipment | Aboveground storage tank (sub-definition: oil filled electrical equipment) | General containment (or other diversionary measures or equipment) (112.7(c)) | Not specifically required by 40 CFR 112... but HSC 25270.2(a)(4)(B) requires routine inspections. | Conditionally APSA exempt. |
| Oil-filled operational & equipment | Aboveground storage tank | General containment (or other diversionary measures or equipment) (112.7(c)) | Not specifically required by 40 CFR 112.. | Includes hydraulic tanks & systems, aboveground oil/water separators and other equipment. |
| Loading & unloading areas, oil transfer areas | No specific term | General containment (or other diversionary measures or equipment)(112.7(c)) | Not specifically required by 40 CFR 112. | |
| Facility transfer operations, pumping & facility process (and aboveground piping) | No specific term | General containment (or other diversionary measures or equipment)(112.7(c)) | Regular inspections (112.8(d)(4)). | Also must inspect if buried piping is exposed. |

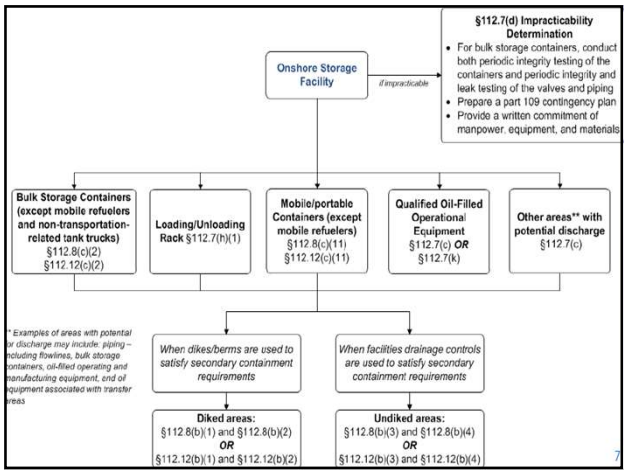
* Sized containment may include diversion to a catchment basin or similar confined termination area.

## What Needs "Containment" per APSA?

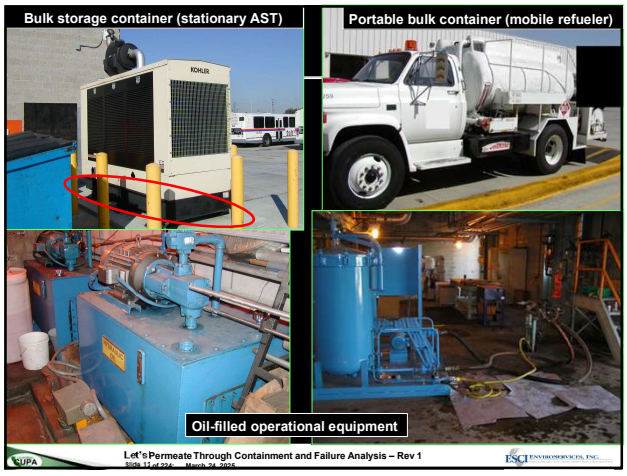
- Almost nothing with less than 55 gallons capacity
  - Tiny TIUGAs still need full containment
- The following if they have 55 gallons or more capacity of petroleum (or any oil for you fed SPCC folks)
  - Tanks
    - Stationary
    - Portable/mobile
  - Containers
  - Process equipment
  - Manufacturing equipment
  - Hydraulic equipment
  - Electrical equipment
  - Non-transportation related tank trucks
    - Including mobile refuelers

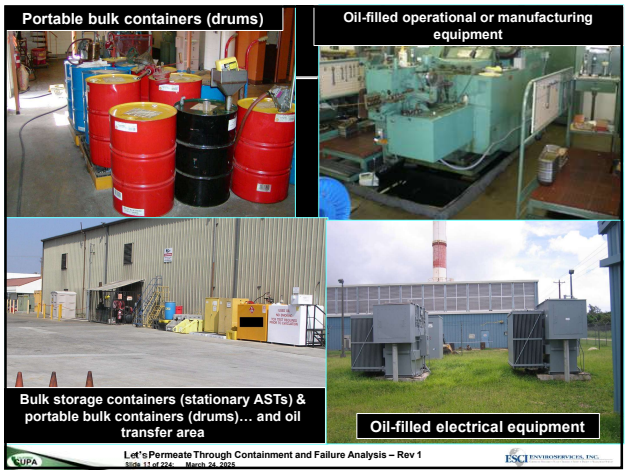

- Also requiring containment at APSA facilities
  - Loading/unloading areas
  - Loading racks
  - Piping
  - Oil transfer and handling areas



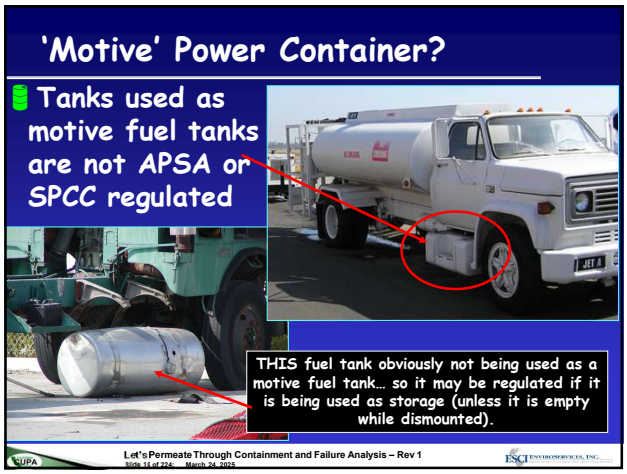














## Type of Secondary Containment Requirements

- *Specific* Containment vs *General* Containment
  - Federal rule includes two categories of secondary containment requirements:
    - ✦A general provision addresses the potential for oil discharges from all regulated parts of a facility
      - The containment method, design, and capacity are determined by good engineering practice to contain the most likely discharge of oil until cleanup occurs
    - ✦Specific provisions address the potential of oil discharges from areas of a facility where oil is stored or handled
      - The containment design, sizing, and freeboard requirements are specified by the SPCC rule to address a major container failure



## Containment Summary: Two types of containment

- 'Sized' ('specific') containment
  - For bulk tanks & containers (stationary & portable)
  - 100% containment of largest container capacity
    - ✦Plus 'adequate' precipitation freeboard
  - Passive, engineered or constructed systems
- 'General' containment or other diversionary measures
  - For oil-filled equipment, non-transportation tank trucks, piping and oil handling, loading, unloading & transfer areas
  - Sufficient to keep the 'most likely/typical failure mode' oil discharge from reaching navigable waters prior to clean up
  - May be active or passive in design, deployment or operation



## Potential Containment Issues

- Secondary containment not obvious:
  - Mfr plate/UL listing not present or visible
  - Containment vents or monitor ports not visible or present
    - ✦Many generator base tanks and older stand-alone tanks
- No obvious curbing or berms
- Assuming the curbing/berm/containment pallet is adequate
  - Need to verify capacity (USEPA's improved containment calculation tool)
  - Precipitation freeboard mis-estimated or calculated
    - ✦Don't forget tank/container displacement
  - Not maintained (cracked, broken, etc.)
- No closable drainage valves
- Misunderstanding what type of containment is required
- Assumptions about O/W separators or door threshold drains as containment may be incorrect
- Assumptions about active response measures may be incorrect

## 'Sized'/'Specific' Containment (aka secondary containment) for Bulk Tanks & Containers

- **Sized containment:**
  - Must contain the ***capacity*** of the largest single oil tank, compartment or container plus "sufficient freeboard" to contain precipitation
    - ✦Intended to address *catastrophic failure* of bulk tanks & containers
    - ✦Precipitation amount is a performance standard
  - Methods are up to the facility
    - ✦ US EPA provides examples in the rule
      - **All are passive, constructed/engineered measures**
  - Diked areas (walls and floor) must be sufficiently impervious to contain discharged oil until clean up
    - ✦Imperviousity is also a performance standard

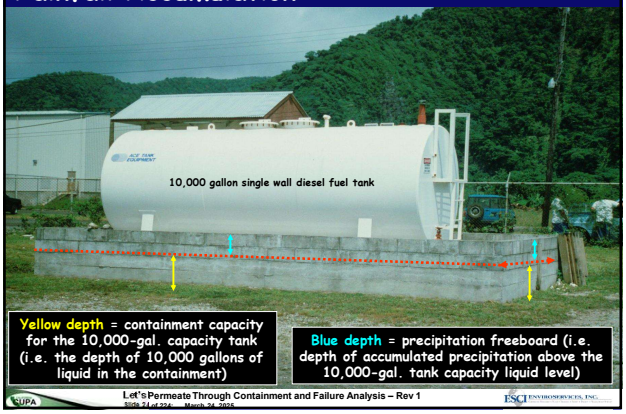


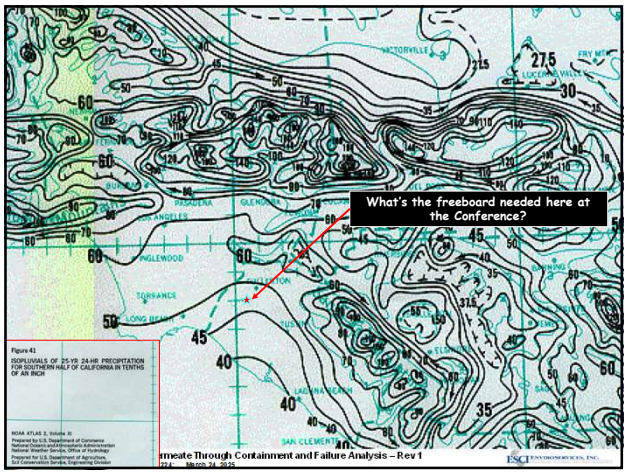
## Determining Precipitation Freeboard

- **Only applicable to bulk tanks or containers**
  - **Not required for oil filled equipment, piping, or transfer areas**
- **Only if exposed to rain fall**
  - **… not required for integral double wall tanks, tanks under roof or inside buildings**
    - ✦Sprinkler flow containment is a fire code requirement – not SPCC
- **How much? Typically use:**
  - **24 hours of a 25-year storm**
  - **110% or 115% of largest tank or combined tank capacity**
  - **Don't forget to account for displacement volumes!**



## Freeboard = Containment Depth for Rainfall Accumulation



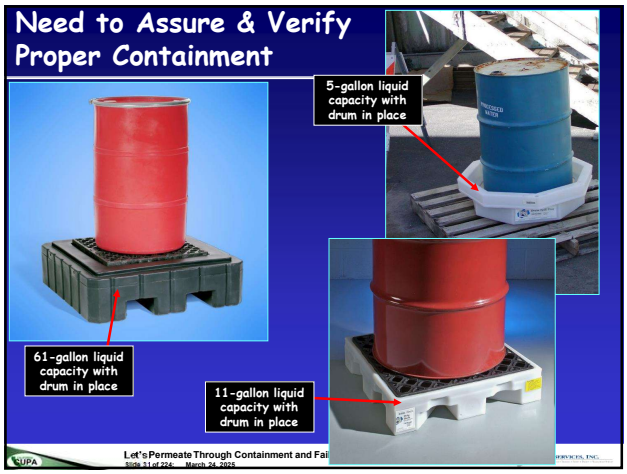


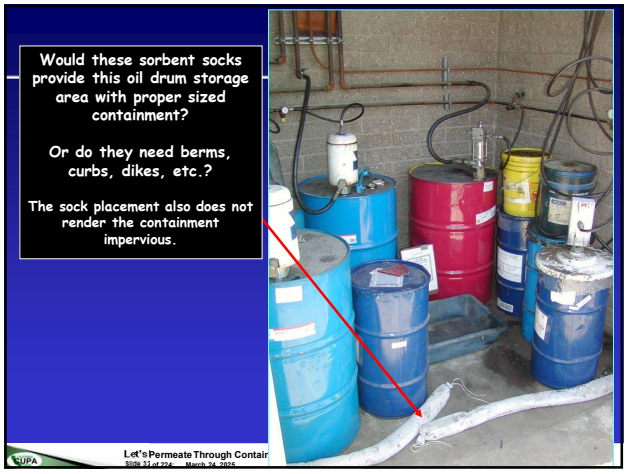


The black containment pallets appear to have sufficient capacity for more than 6 inches of rain (plus the 55-gallon drum capacity).

The yellow containment pallet would be sufficient for capacity of a 55-gallon drum – but has far less precipitation capacity. These yellow pallets may have been intended for inside use.






## Portable Diesel Generators and Other Portable Diesel-fired Equipment


Type of containment required?

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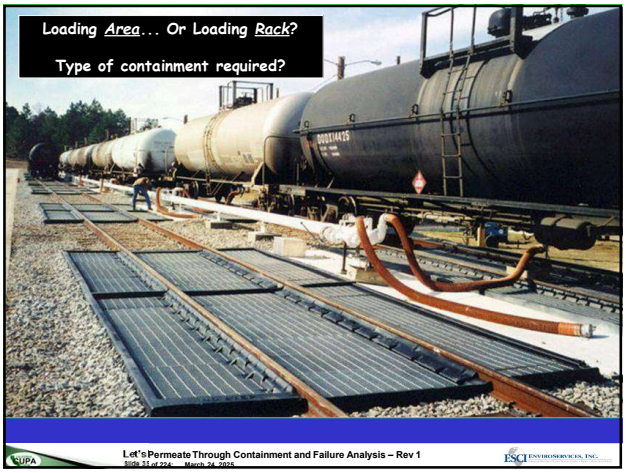


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## Sized Containment Methods

- Examples (in the rule):
  - Dikes, containment curbs and pits
    - Basically: passive, engineered systems
  - Rule allows a specific alternative system
    - Drainage trench enclosure arranged so any discharge terminates and is safely confined in a facility catchment basin or holding pond

Except for the 'dead' containment sumps, all other drainage at this facility goes into this large retention (separation) basin

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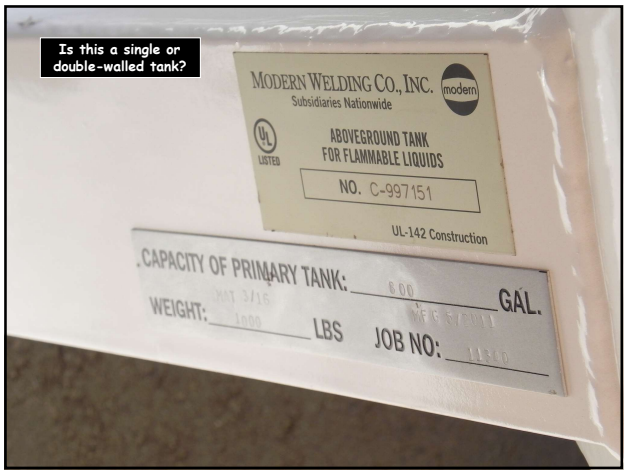
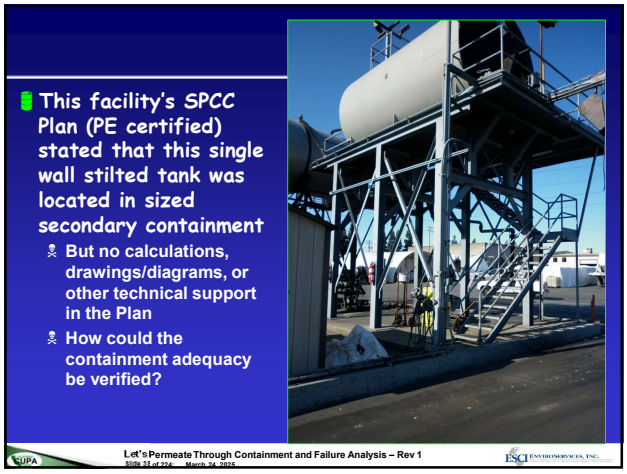


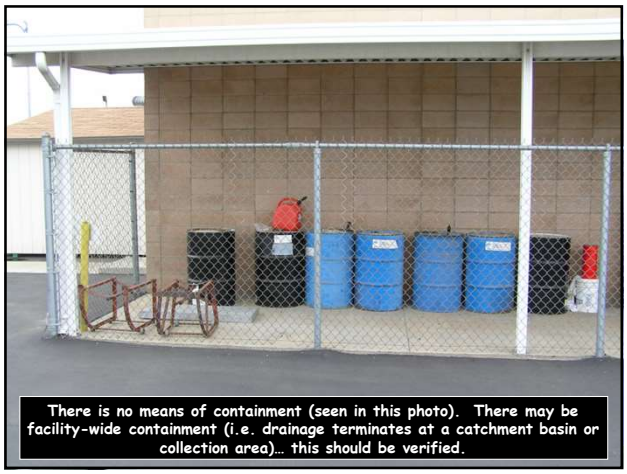

While facility personnel are working in the area or working with this drum – it would be under operational control, and only general containment required.

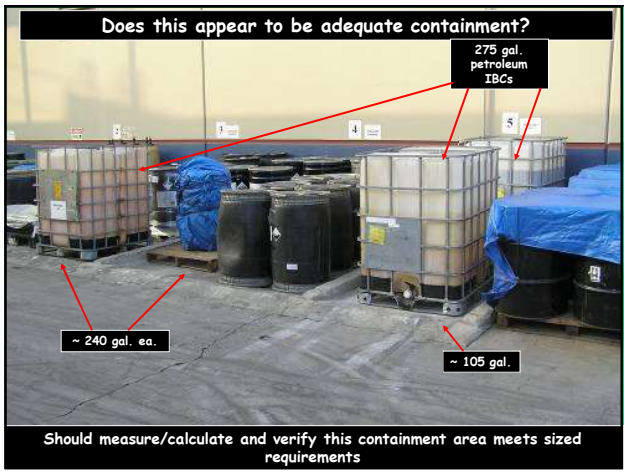
But when personnel are in a different part of the facility and off-hours, the portable container needs to be provided sized containment (shown here)

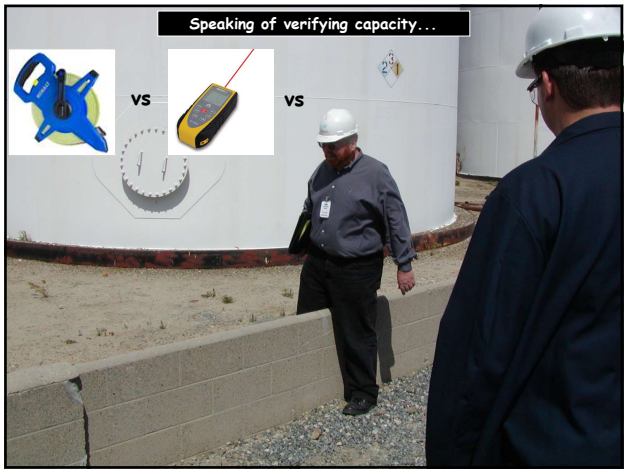






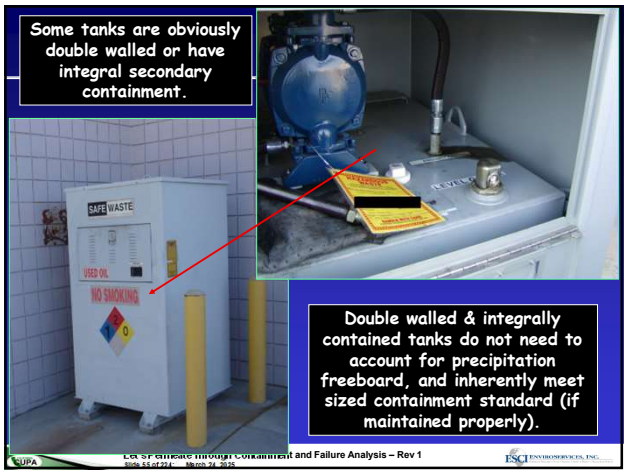



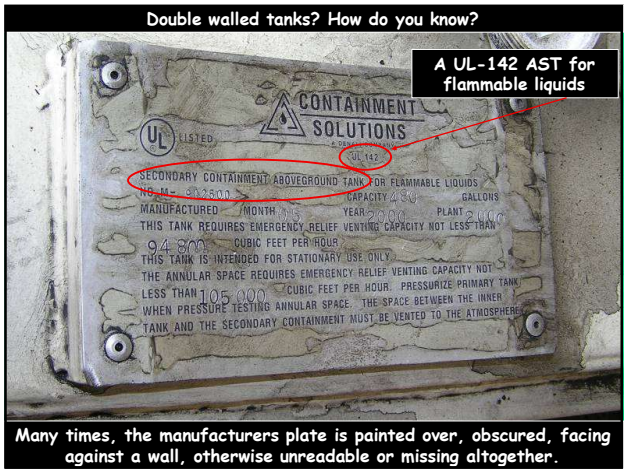


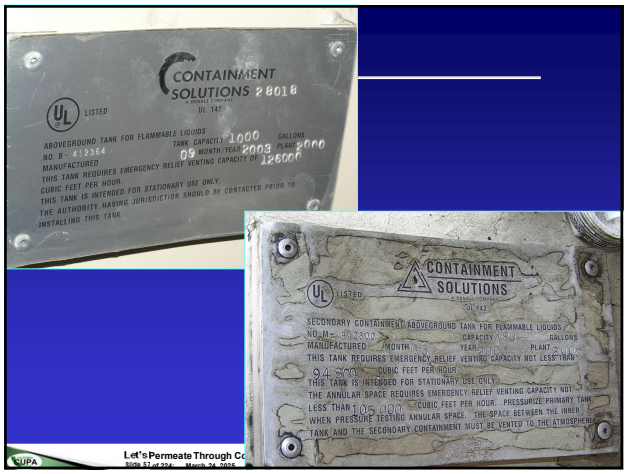



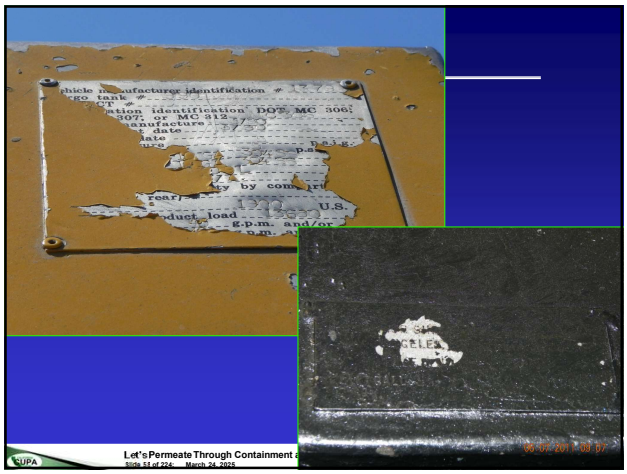

## Double-Walled vs Single Walled Tanks

- Double walled (and/or tanks with integral secondary containment)
  - Meet required secondary containment capacity
  - Do not need to account for precipitation freeboard
  - Typically manufactured to various industry specs (UL-142, UL-2085, etc.)
    - ✦But some specs include both single and double wall tanks
  - May look similar to single walled tanks
    - ✦Not always obvious… so can not assume
  - Additional curbing may be present but not required
  - The interstice must be inspected or monitored







But do not assume that all fittings are marked (some are painted over or otherwise weathered).

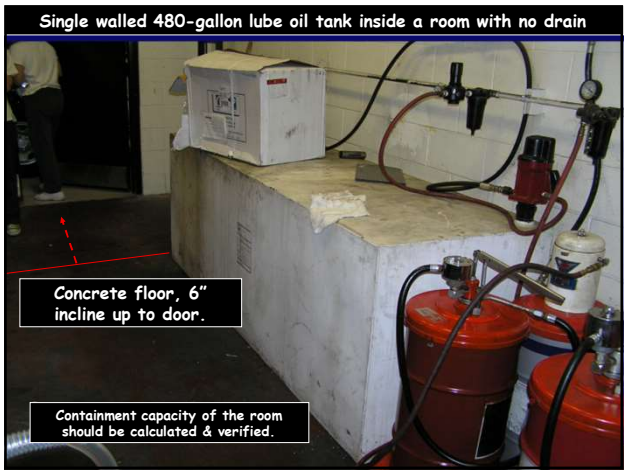
"Monitor Port" indicates the presence of an interstitial space (and therefore a double walled tank).

Day tanks for several emergency generators. Should verify capacity and whether single wall (& proper containment) or double wall.

High-end containment... Also good for scrubbing up doggies!

Containment? Other Issues?





## Sized Secondary Containment Criteria:

Mobile or Portable Storage Containers
40 CFR 112.8(c)(11)

- Must contain the largest single oil compartment or container
  - Plus sufficient freeboard to contain precipitation
- Examples:
  - Dikes, curbs, containment pallets, containment pits, etc.

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Let's Permeate Through Containment

## Page 9 G-10 Detail: Secondary Containment for Bulk Containers

- Already discussed secondary containment…
  - But be aware of the 'discharge prevention positioning' requirement for portable containers and tanks

| | | |
|---|---|---|
| pressure and temperature. *[§§112.8(c)(1) and 112.12(c)(1)]* | | |
| Secondary containment for the bulk storage containers (including mobile/portable oil storage containers) holds the capacity of the largest container plus additional capacity to contain precipitation. Mobile or portable oil storage containers are positioned to prevent a discharge as described in §112.1(b). *[§112.6(a)(3)(ii)]* | ☐ | ☐ |
| If uncontaminated rainwater from diked areas drains into a storm drain or open watercourse the following | | |

  - Applies to ALL categories of APSA facilities

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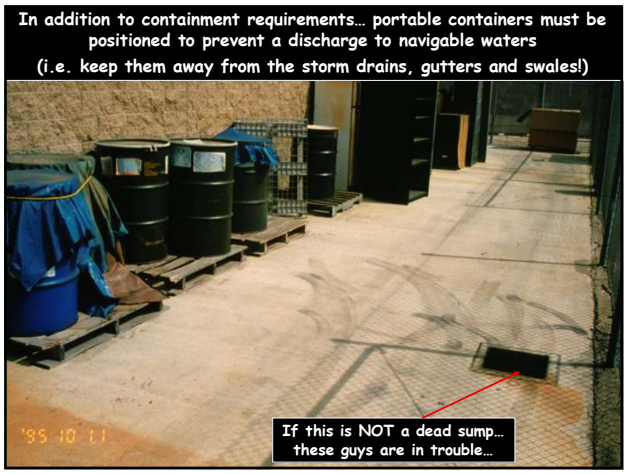


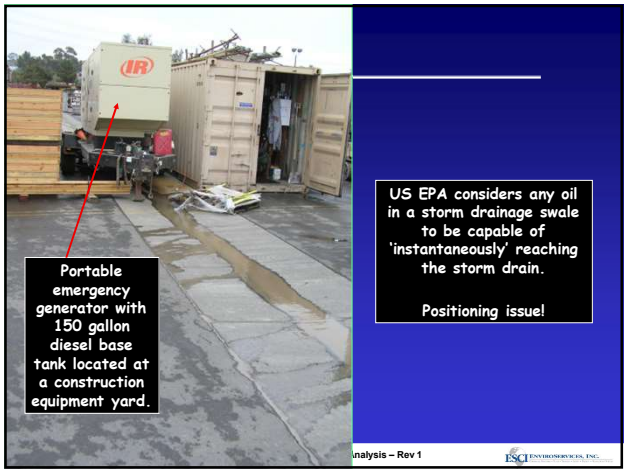



## Loading Racks


## Sufficiently Impervious

- Secondary containment system "must be capable of containing oil and must be constructed so that any discharge ... will not escape containment system before cleanup occurs" (40 CFR 112.7(c))
- Diked areas must be "sufficiently impervious to contain oil" (40 CFR 112.8(c)(2))

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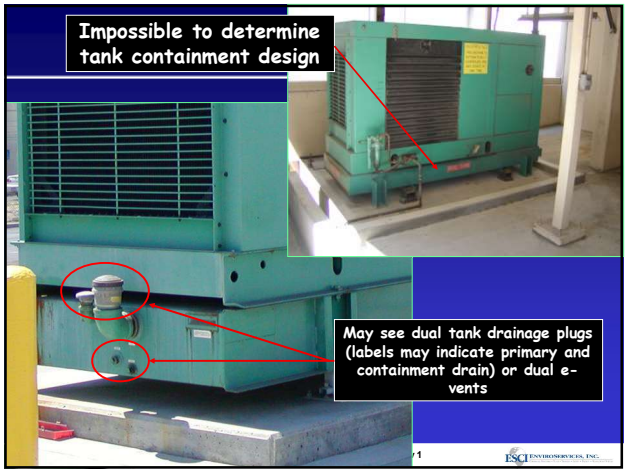
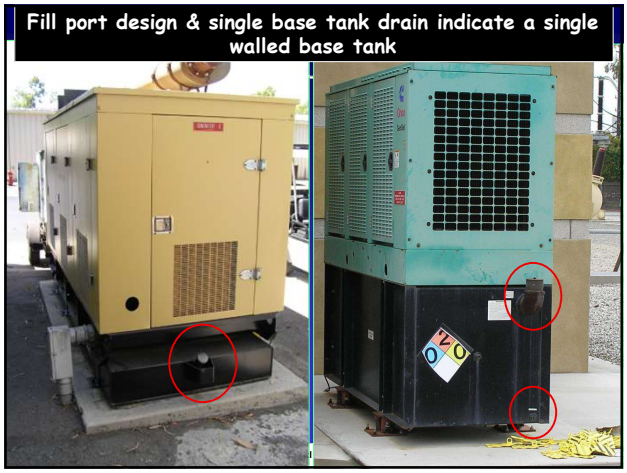
## Generator Base Tanks: Single vs Double Walled?

- Base fuel tanks on generator units (if > 55-gal cap.) are bulk storage tanks
  - May be single walled or double walled
  - Can range from very easy to very difficult to determine
    - ✦Not always visually apparent or fittings accessible
    - ✦Not always stated on manufacturers plate or other info
    - ✦Often was optional equipment from manufacturer
      - May be no record whether the option was selected
    - ✦Fuel tank serial numbers not always visible or readable
    - ✦Manufacturer may be out of business










## 'General' Containment or Diversionary Measures for All Other Areas & Equipment

- 40 CFR 112.7(c) requirements for general oil handling areas & equipment are not the same as requirements for bulk tanks & containers
  - A much broader, performance-oriented requirement
  - Bulk tanks & oil-handling may be co-located at the facility, and have combined requirements and methods
- General petroleum-handling areas of the tank facility and specific equipment include:
  - Oil handling and transfer areas (including piping)
  - Loading/unloading areas
  - Oil-filled manufacturing, operational & electrical equipment

## 'General' Secondary Containment Rule Text

- Provide appropriate containment and/or diversionary structures or equipment to prevent a discharge as described in §112.1(b), except as provided in paragraph (k) of this section for qualified oil-filled operational equipment, and except as provided in
  - §112.9(d)(3) for flowlines and intra-facility gathering lines at an oil production facility
- The entire containment system, including walls and floor, must be capable of containing oil and must be constructed so that any discharge from a primary containment system, such as a tank, will not escape the containment system before cleanup occurs
- In determining the method, design, and capacity for secondary containment, you need only to address the *typical failure mode*, and the *most likely quantity* of oil that would be discharged
- Secondary containment may be either active or passive in design

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## What Needs General Containment?

- Process equipment
- Manufacturing equipment
- Hydraulic equipment
- Electrical equipment
- Non-transportation related tank trucks
  - Including mobile refuelers
- Loading/unloading areas
- Loading racks
- Piping
- Oil transfer and handling areas

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## Transfer (& Loading/Unloading) Areas

- Example activities that occur within transfer or loading areas include:
  - Unloading fuel from a truck to a bulk fuel tank
  - Loading oil into a vehicle from a dispenser
  - Loading fuel from a mobile refueler into an airplane or other vehicle
  - Loading lubricating oil from a truck into equipment
  - Transferring fuel from a drum onto a generator base tank
  - Oil piping pathways
  - Unloading and moving drums and totes on a forklift

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## General Containment or Diversionary Means

- Must be able to prevent the *most likely discharge* that may be harmful (i.e., a discharge in harmful quantities to nav. water or adjoining shorelines [§112.1(b)])
  - Sized secondary containment may also fulfill the general secondary containment requirements
- Entire containment 'system' including walls and floor must be
  - Capable of containing oil
  - Constructed so that any discharge from primary containment will not escape before clean-up occurs
- This is the *minimum* expectation for containment
  - General facility requirement
  - No specific capacity sizing or freeboard requirements
  - Alternative option for qualified oil-filled operational equipment
    - More on this later



## General Containment Criteria

40 CFR 112.7(c)

- To prevent a discharge in harmful quantities to navigable water
  - Harmful = enough oil to cause a sheen upon the water or adjoining shoreline
  - Navigable water = 'most' storm water systems (*very* legally wonky)
    - Discharging into municipal storm water systems, creeks, rivers, ocean, many ephemeral streams
  - Is the public street curb leading to a navigable water?
    - Can be interpreted that way
      - But may be a legal determination

## General Containment Criteria
### 40 CFR 112.7(c)

- **Is a storm swale or trench navigable water?**
  - Usually not – until the spill reaches the actual drain… or drain outlet. But:
  - Per US EPA (40 CFR 112 Appx. C-III, 5.2)
    - **Assumption is that once oil reaches a storm drain inlet, it will flow into the receiving navigable water… and**
    - **The time required for oil to travel through a storm drain or open concrete channel to navigable water is negligible and can be considered instantaneous**



## General Containment Criteria
### 40 CFR 112.7(c)

- **Must only address the typical failure mode and most likely quantity of oil that would be discharged (from each equipt., type, area, activity, etc.)**
  - **Typical failure mode?**
    - **As determined/certified by the facility**
    - Based on experience & research ([formal or informal], available data, professional, institutional / organizational experience or data, anecdotal, informal discussions, etc.)
    - Determination is subjective!
      - **No standard or requirement for back up or supporting data, or level of research, or depth/breadth of review**
      - **Uses a 'common sense', reasonability 'test'**
  - **We'll talk about this in the ever-so-fun Failure Analysis/Spill Prediction part of the class**



Table G-4 below identifies the tanks and containers at the facility with the potential for an oil discharge; the mode of failure; the flow direction and potential quantity of the discharge; and the secondary containment method and containment capacity that is provided.

**Table G-4 Containers with Potential for an Oil Discharge**

| Area | Type of failure (discharge scenario) | Potential discharge volume (gallons) | Direction of flow for uncontained discharge | Secondary containment method[a] | Secondary containment capacity (gallons) |
|---|---|---|---|---|---|
| *Bulk Storage Containers and Mobile/Portable Containers[b]* | | | | | |
| *Oil-filled Operational Equipment (e.g., hydraulic equipment, transformers)[c]* | | | | | |
| *Piping* | | | | | |
| *Product Transfer Areas (location where oil is loaded to or from a container, pipe or other piece of equipment.)* | | | | | |
| *Other Oil-Handling Areas or Oil-Filled Equipment (e.g. flow-through process vessels at an oil production facility)* | | | | | |

e.g. from the Tier I template: Table G-4 is where the failure mode and the potential discharge volume gets recorded

[a] Use one of the following methods of secondary containment or its equivalent: (1) Dikes, berms, or retaining walls sufficiently impervious to contain oil; (2) Curbing; (3) Culverting, gutters, or other drainage systems; (4) Weirs, booms, or other barriers; (5) Spill diversion ponds; (6) Retention ponds; or (7) Sorbent materials.
[b] For storage tanks and bulk storage containers, the secondary containment capacity must be at least the capacity of the largest container plus additional capacity to contain rainfall or other precipitation.
[c] For oil-filled operational equipment: Document in the table above if alternative measures to secondary containment (as described in §112.7(k)) are implemented at the facility.

Facility Name: _____ Page 4 Tier I Qualified Facility SPCC Plan

## Methods of Secondary Containment Listed in 40 CFR 112.7(c) – List not comprehensive

- Dikes, berms, or retaining walls
- Curbing or drip pans
- Culverting, gutters, or other drainage systems
- Weirs, booms or other barriers

- Spill diversion ponds
- Retention ponds
- Sorbent materials
- Sumps and collection systems

40 CFR 112.7(c) requires that, at a minimum, the facility must use one of these prevention systems or it's equivalent



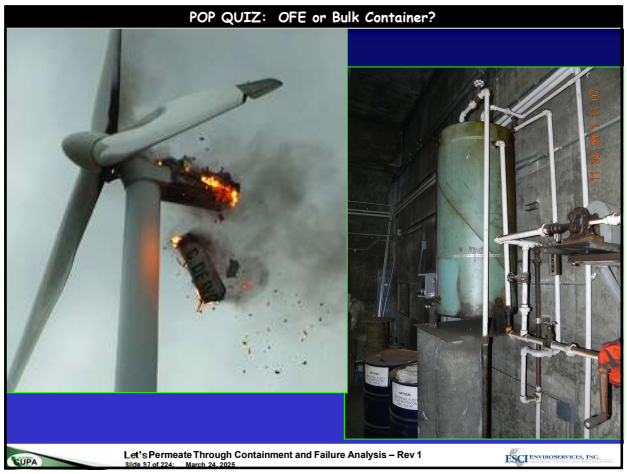
## General Containment Performance Requirement

- Entire containment 'system' including walls and floor must be
  - Capable of containing oil
  - Constructed so that any discharge from primary containment will not escape before clean-up occurs
- 'System' could potentially include:
  - Traditional curbs and asphalt or concrete base
  - Gravel beds and soil base
  - Spill pads and sorbent socks
  - Storm drain covers or closure systems
  - Door thresholds, flooring, building walls, sump systems
    - Use caution, however. Impervious? Leads to where?
  - Oil-water separators, etc.



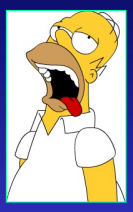
## Factors Affecting General Containment Performance/Capacity

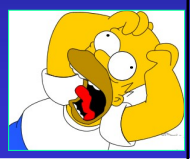
- These may include:
  - Variable rate of transfer to/from tanks, etc.
  - Ability to control a discharge from whatever is discharging
    - E.g. pressurized piping, hazard of released oil/petroleum
  - Level of training (and awareness) of facility or vendor personnel
  - Type, location and amount of absorbents, etc.
  - Presence or absence of monitoring instrumentation, inspections, 'walk-arounds', etc. to detect a discharge
  - Distance and slope from location of release to potential discharge (e.g. storm drain) point that may affect probable time needed to stop discharge
  - Presence or absence of automatic valve actuators
  - Facility and vendor performance and procedure conformance




## Passive vs. Active Containment Measures

- Allowed to use active and/or passive containment measures to prevent a discharge
  - Passive measures are generally viewed by US EPA as being more reliable
  - Selection is up to facility owner/operator
    - ✦Internal and agency inspections should verify presence and implementation
      - E.g. well stocked and located spill kits, trained and aware employees, well managed sorbent pads and trays, etc.
- Passive measures: Permanent installations and do not require deployment or action by the owner or operator
- Active containment measures: Those that require deployment or other specific action by the owner or operator





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## Active or Passive for General Containment

- The use of both active and passive 'secondary' containment measures is allowed
- Active containment measures are those that require deployment or other specific action by the operator
  - These may be deployed either before an activity involving the handling of oil starts, or in reaction to a discharge
- Passive measures are permanent installations and do not require deployment or action by the owner or operator
- Guess which poses less risk?
- How do you verify compliance and adequacy?

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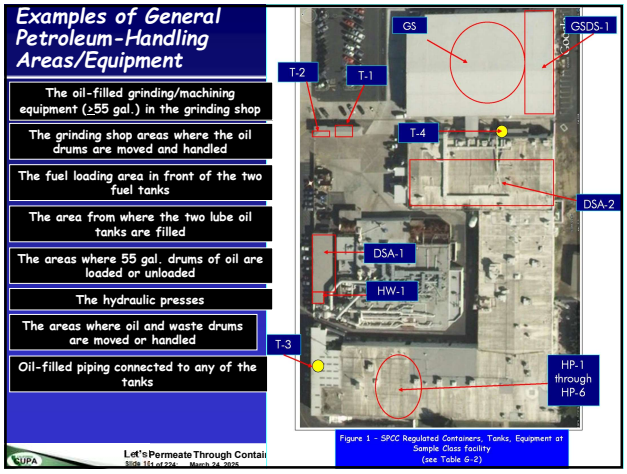
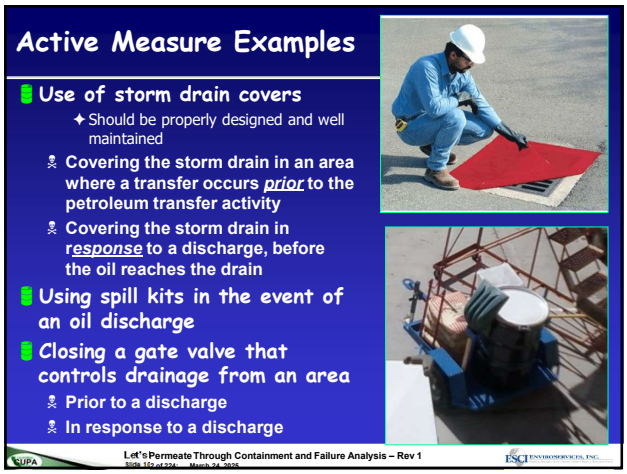
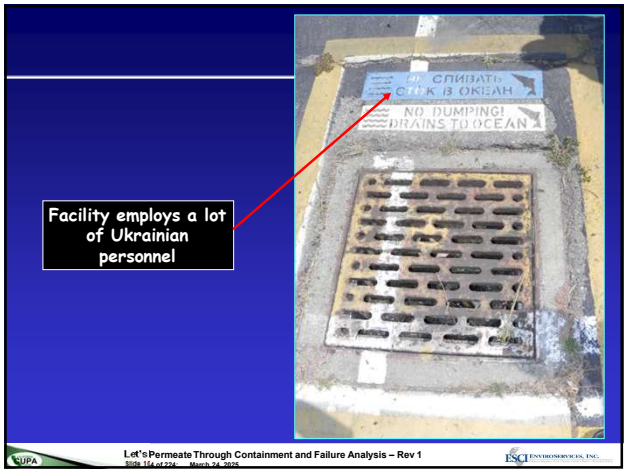



## Loading/Unloading & Transfers from Exempt Containers or Tanks at an SPCC-Regulated Facility

- IS an SPCC rule (and APSA) regulated activity and area
- 112.7(c) general containment required

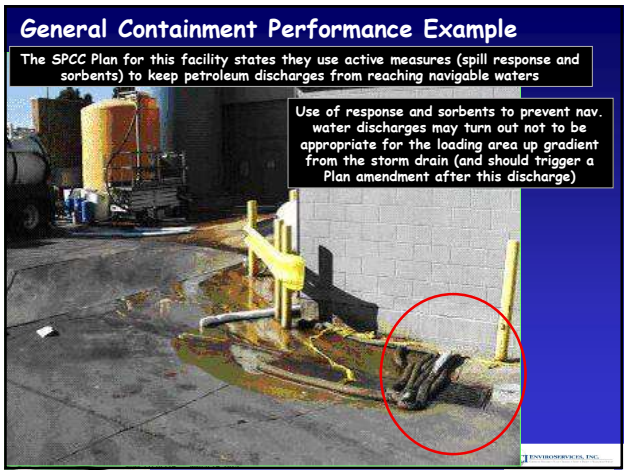


Non-transportation related tank trucks (on-site mobile refueler), including towed bulk containers, used solely to store & transport fuel (oil) for transfer into/from aircraft, motor vehicles, locomotives, tanks, vessels, or other oil storage containers.
= General containment for most likely spill

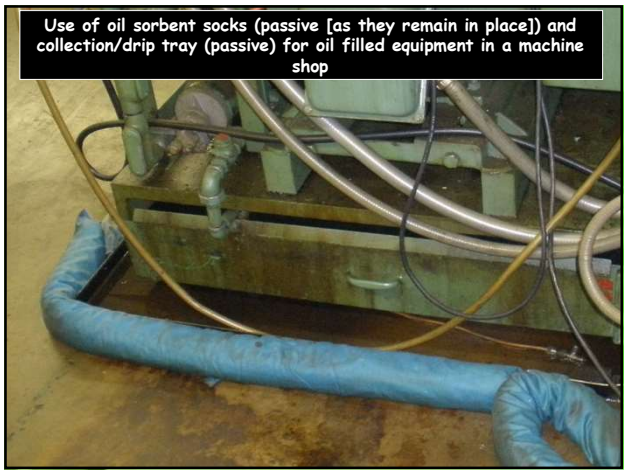


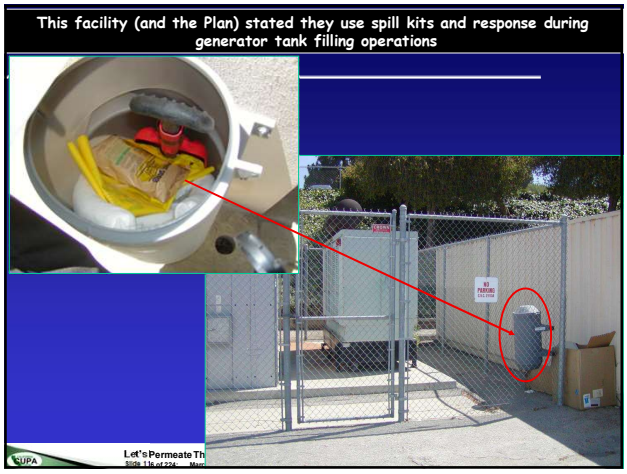
Non-transportation related tank trucks (on-site mobile refueler) = general containment for most likely spill

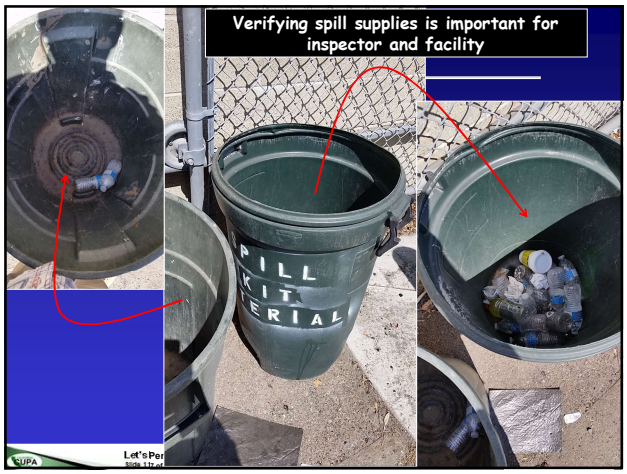










## CONTAINMENT MONITORING/INSPECTIONS

- Don't forget...
  - The outside of the primary tank must be inspected
  - Easy for single-walled systems in a diked area
  - How about for integral double-walled tanks?



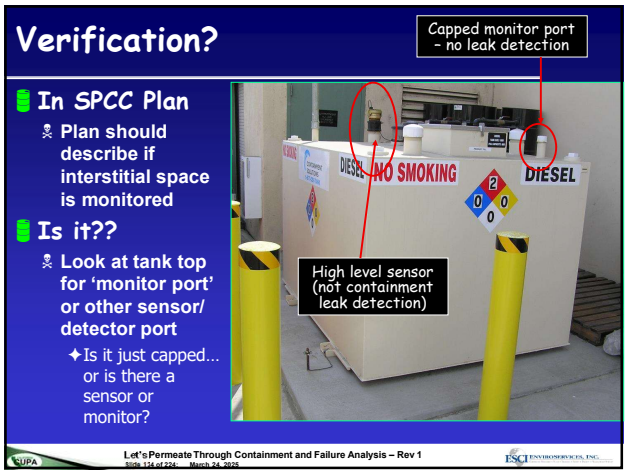

## Visual Inspection of Double Walled Tanks for Leaks?

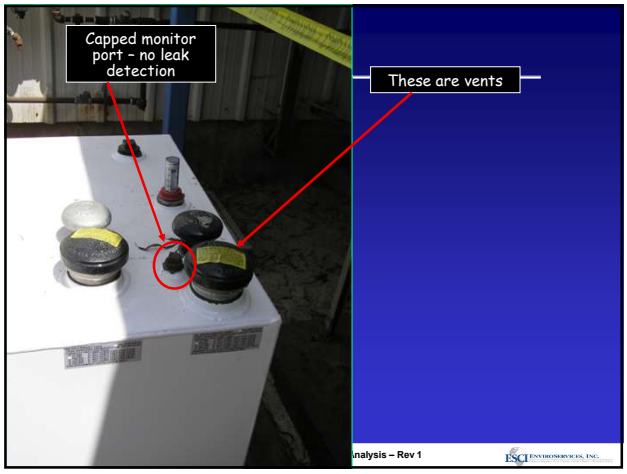
- How would a facility inspect the outside of the tank for leaks?
  - ✦Or inspect the containment for accumulation of oil
- The outside you see here is the ***outside*** of the ***secondary*** containment
  - ✦Not the outside of the primary tank



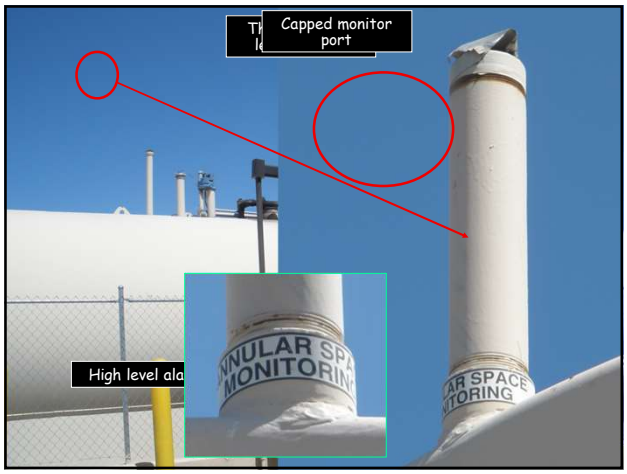

## Visual Inspection of Integral Double Walled Tanks for Leaks?

- Most have provisions for the use of interstitial space leak detection or monitoring
  - Some tanks ***are*** already equipped with leak detectors
    - Manufacturer or supplier optional equipment
  - ✦Mechanical or electronic systems
    - Locally or remotely reported
  - Most tanks are not so equipped
  - ✦Facilities may assume that visually inspecting the outside of the tank (the outside surface) is sufficient... but it's not
    - A likely potential compliance issue (2002 US EPA memo raised the issue)

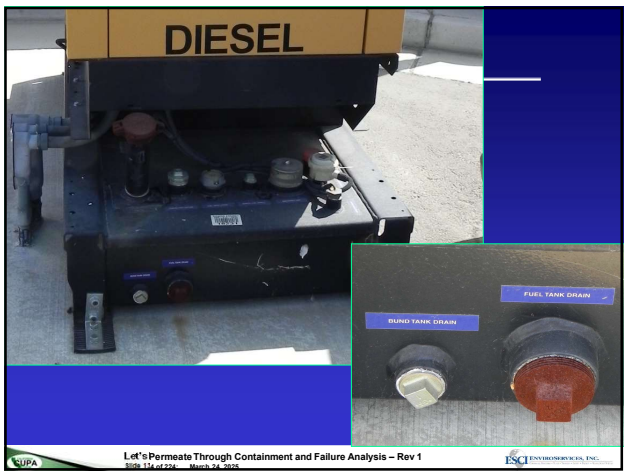


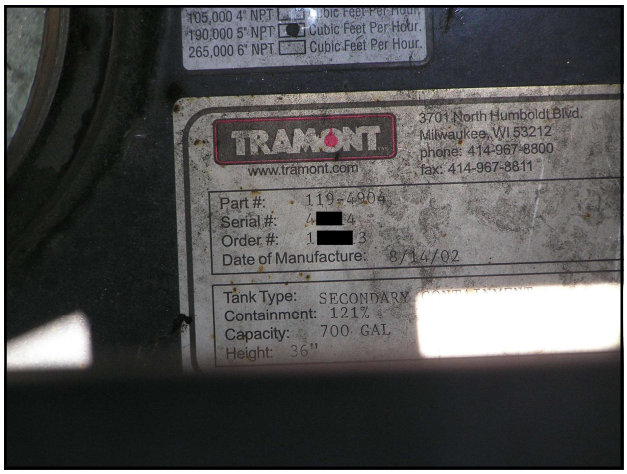


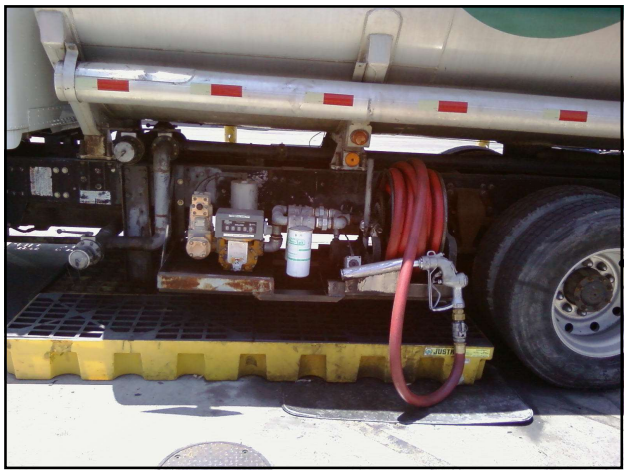








## Oil-filled Equipment

- Contains oil for lubrication, hydraulic pressure, heat dissipation, processing, or other such purposes
- Not regulated as 'bulk storage containers'

### Operational

- Supports operation of the apparatus or device
- E.g. oil pumps & pumps, hydraulic systems, oil compressors, circulating oil lubrication systems, heat transfer systems flow through systems

### Manufacturing

- Flow-through process systems
- E.g. process vessels, reactors, fermentors, oil treatment tanks, and distillation columns

### Electrical

- Transformers, circuit breakers, capacitors, neutral ground reactors, etc.



## "Qualified Oil-Filled Operational Equipment"?

- Speaking of general containment…

No impracticability determination needed for the qualified oil-filled operational equipment.

Use of alternative measures is optional…facility owner/operator can provide secondary containment (i.e. general containment)

Five Year Review Log and Technical Amendment Log in Attachments 1.1 and 1.2.]

3. Optional use of a contingency plan. A contingency plan:

The §112.7(k) alternative to general containment for qualified oil-filled operational equipment is available to ALL types/categories of facilities (QF and non-QF)

A PE certification for THIS §112.7(k) containment alternative is not required.

This is NOT the SIZED containment impracticability determination for bulk containers (§112.7(d)) which DOES require a PE cert.

Signature _____ Title: _____

Name Date: / / 20



## "Qualified Oil-Filled Operational Equipment" (40 CFR 112.7(k)) ?

- Definition and applicability commonly misunderstood
- Most facilities likely meet (k)(1)
- Think about all the general containment methods…and the likely release volume/mode… and then decide:
1. Is adding routine inspections or monitoring of the OFOE implementable?
2. Is the 112.20 FRP or the 109 OSCP *really* a better, cheaper, easier option?

(k) *Qualified Oil-filled Operational Equipment.* The owner or operator of a facility with oil-filled operational equipment that meets the qualification criteria in paragraph (k)(1) of this sub-section may choose to implement for this qualified oil-filled operational equipment the alternate requirements as described in paragraph (k)(2) of this sub-section in lieu of general secondary containment required in paragraph (c) of this section.

(1) *Qualification Criteria—Reportable Discharge History:* The owner or operator of a facility that has had no single discharge as described in § 112.1(b) from any oil-filled operational equipment exceeding 1,000 U.S. gallons or no two discharges as described in § 112.1(b) from any oil-filled operational equipment each exceeding 42 U.S. gallons within any twelve month period in the three years prior to the SPCC Plan certification date, or since becoming subject to this part if the facility has been in operation for less than three years (other than oil discharges as described in § 112.1(b) that are the result of natural disasters, acts of war or terrorism); and

(2) *Alternative Requirements to General Secondary Containment.* If secondary containment is not provided for qualified oil-filled operational equipment pursuant to paragraph (c) of this section, the owner or operator of a facility with qualified oil-filled operational equipment must:

(i) Establish and document the facility procedures for inspections or a monitoring program to detect equipment failure and/or a discharge; and

(ii) Unless you have submitted a response plan under § 112.20, provide in your Plan the following:

(A) An oil spill contingency plan following the provisions of part 109 of this chapter.

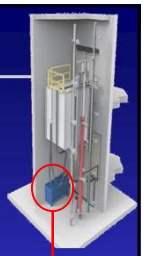
(B) A written commitment of manpower, equipment, and materials required to expeditiously control and remove any quantity of oil discharged that may be harmful.

## General Containment Practicality

- Typical failure mode?
  - Likely a fitting, seal or valve leak
- Rate of leak?
  - Likely less than a gallon/hour or two
- Time to discover and shut down?
  - In operation? Maybe a few hours
    - ✦ Non-operation…is there still pressure in the system?
- Where are the drains or nav. water?
  - Any barriers in the way (curbs, pits, well-sealed door thresholds, etc.)?
- SO: How much general containment would be needed to keep under (e.g.) 10 – 15 gallons out of the nav. water (e.g. storm drain)?
  - Passive?
  - Active… Such as spill absorbents and response by facility personnel after discovery?



## General Containment Practicality?

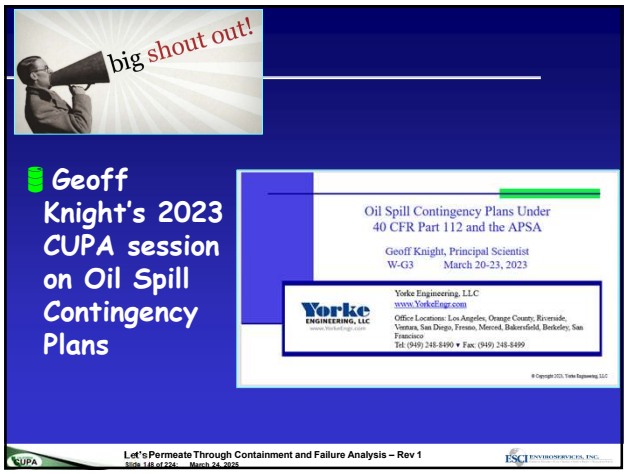


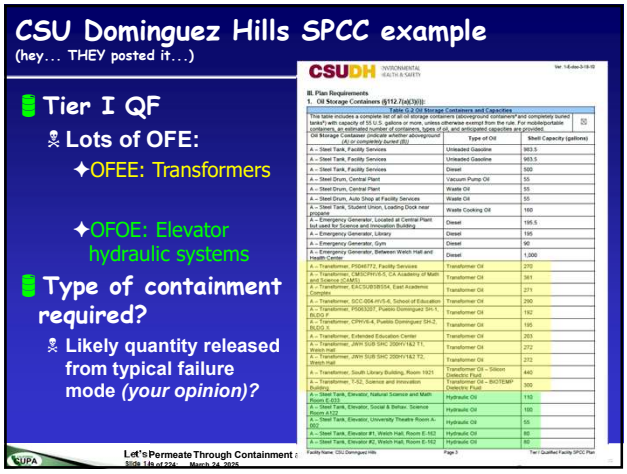
- Really think about whether and why general containment would be impractical
  - Distance to a waterway or an on-site storm drain (even sewer drain)
  - Slope
  - Time to discover and respond
  - Physical arrangement of the equipment (e.g. space for passive containment)
  - Etc.
- Elevator example
  - Hydraulic equipment typically in adjacent equipment room or in a subgrade pit or in a basement
    - ✦ TIUGA anyone?

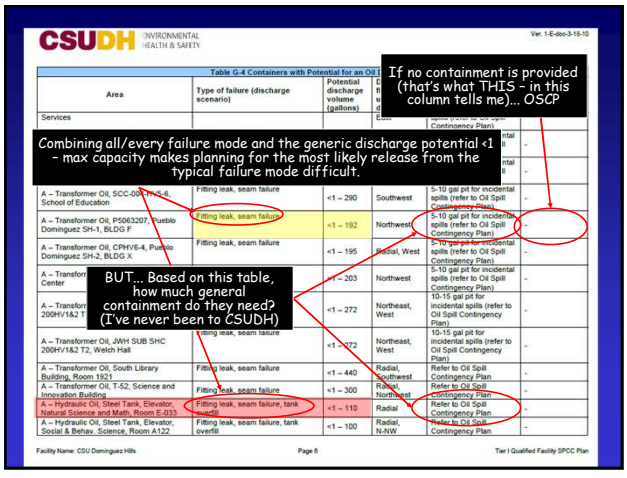


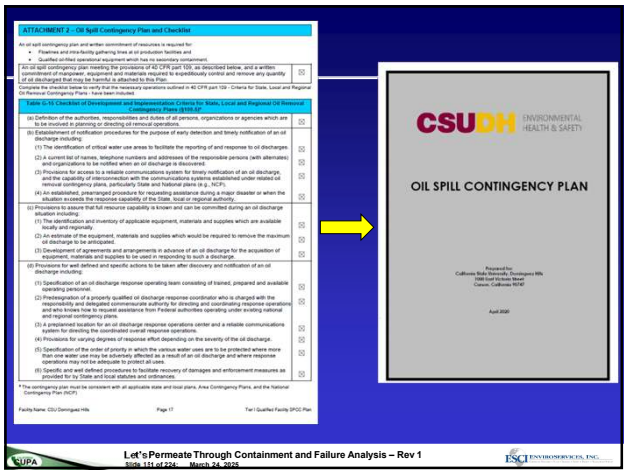
## Recall the §112.7(k) Alternative requirements?

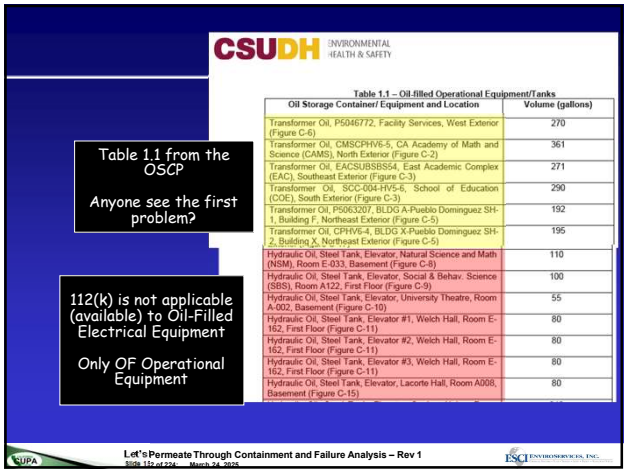
- Inspection procedures or a monitoring program to detect equipment failure and/or discharge
  - *This isn't a bad idea no matter what, right?*
- An oil spill contingency plan following the provisions of part 109 of this chapter
  - *This is NOT your CERS Contingency Plan… Not by a longshot*
- A written commitment of manpower, equipment, and materials required to expeditiously control and remove any quantity of oil discharged that may be harmful
  - *This would be integrated into the part 109 OSCP*
  - *'Discharged'? That's into the navigable water*

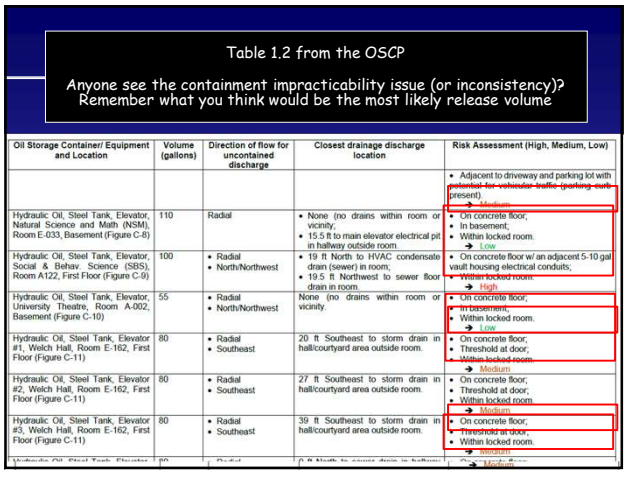


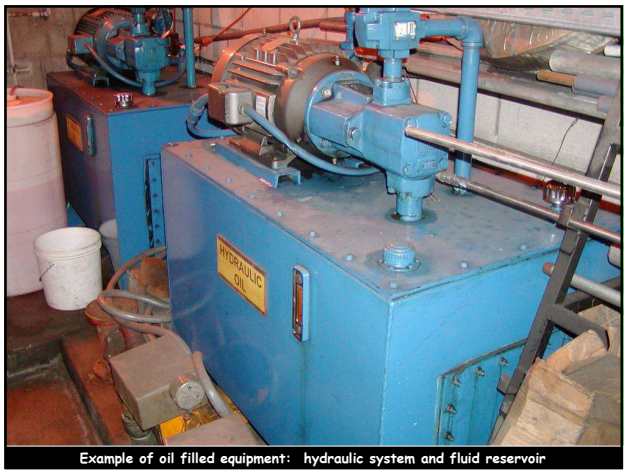


Example of oil filled equipment: machining mill and fluid reservoir

Example of oil filled equipment: part of an oil pressurization and recirculating pumping system. The containment required is 'general' containment.


Example of oil filled equipment: hydraulic system and fluid reservoir

## Failure Analysis/Spill Prediction




## Failure Analysis/Spill Prediction

- *Non-Qualified Facilities & Tier II Qualified Facilities (§ 112.7(b)):* Where experience indicates a reasonable potential for equipment failure (such as loading or unloading equipment, tank overflow, rupture, or leakage, or any other equipment known to be a source of a discharge), include in your Plan a prediction of the direction, rate of flow, and total quantity of oil which could be discharged from the facility as a result of each type of major equipment failure.
- *Tier I Qualified Facilities:* Failure analysis, in lieu of the requirements in §112.7(b). Where experience indicates a reasonable potential for equipment failure (such as loading or unloading equipment, tank overflow, rupture, or leakage, or any other equipment known to be a source of discharge), include in your Plan a prediction of the direction and total quantity of oil which could be discharged from the facility as a result of each type of major equipment failure.

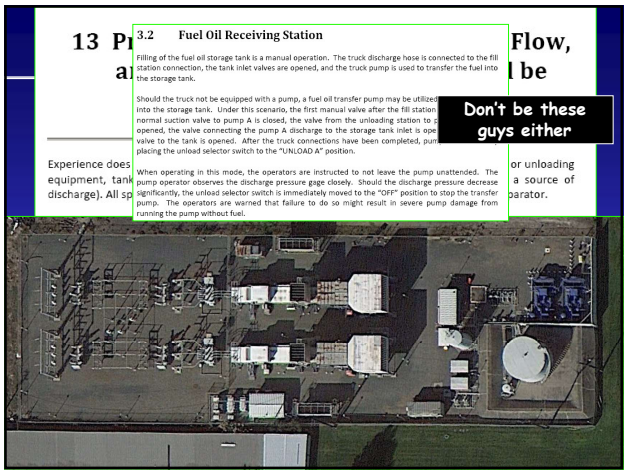


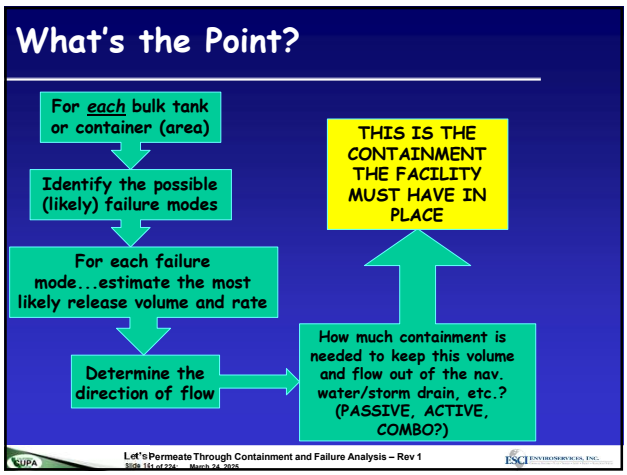
## Don't Be THESE Guys

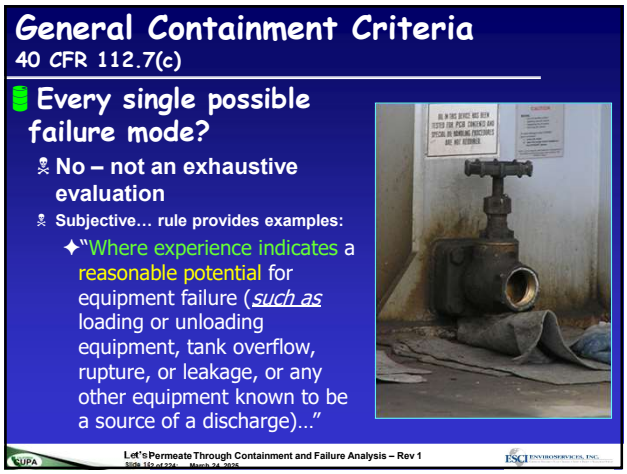
**Rule requirement**

Where experience indicates a reasonable potential for an equipment failure (such as tank overflow, rupture, or leakage), 40 CFR 112.7(b) requires that the SPCC Plan include a prediction of the direction, rate of flow, and total quantity of oil that could be discharged. Based on a review of past spill events, the potential for equipment failure that would result in a discharge of oil in quantities that are potentially harmful to the public health or welfare *or* to the environment as defined in 40 CFR 110.3 has not been established at the [redacted] campus.

Not the right way to comply…
It's not just YOUR personal or your facilities experience.



## General Containment Criteria
40 CFR 112.7(c)

- **Most likely quantity that would be discharged?**
  - **As determined by the facility**
  - ✦ Based on experience (yours and others) & research
  - ✦ Determination is subjective
    - Facilities (and Plans) can assume that inspection & response procedures would be followed and a discharge detected per inspection or operational procedures…
      - whether they ARE in actual practice is a Plan implementation and CUPA inspection issue
- **Spill predictions**
  - ✦ Plans must list / describe the various scenarios (failure modes, flow rates, volumes, direction)



## Failure Modes Based on General Experience

Identify the possible (likely) failure modes

- **Typical failure mode/scenario?**
  - **Common modes/scenarios:**
    - **Catastrophic failure** (always for bulk containers and tanks)
    - **Overfills**
    - **Piping connection leaks/weeps**
    - **Loading or unloading hose ruptures**
    - **Hose connection failures**
    - **Weeps/leaks from valves, fittings or gaskets**
    - **Weeps/leaks from small structural defects or damage**
    - **Portable tank/drum tip over during movement**
    - **Spearing IBCs with a forklift**



## Potential Discharge Volume?

For each failure mode…estimate the most likely release volume and rate

- **Estimate/calculate discharge rate for each event or scenario**
  - ✦ Calculated / estimated flow rates
    - **Fuel truck loading pump rate**
    - **Size of crack, hole or weep and likely release rate**
    - **Estimated time for discovery**
    - **Estimated time for response (stop leak and stop the released material from reaching a drain or off-site, etc.**

    Can assume that inspection & response procedures would be followed (and all required supplies are present)… whether they ARE is an implementation and inspection issue

## Potential Discharge Volume?

For each failure mode…estimate the most likely release volume and rate

- Likely quantity that would be discharged?
  - Based on experience & research (as before)
  - Determination is subjective (as before)
    - Not rocket science or a formal statistical analysis
  - e.g. Tank/container overfills & hose ruptures:
    - Est. flow rate x time to shut it down
      - Drums/IBCs: ~10 gpm x 30 sec. (0.5 min) = ~ 5 gallons
      - Fuel trucks = ~120 gpm x 30 sec. (0.5 min) = ~ 60 gallons
  - e.g. Drum / IBC handling (tip over or forklift spear)
    - ~25 gpm x 1 min = 25 gallons to 150 gallons
  - e.g. Mill or hydraulic press leak
    - ~ 1 – 10 gpm x 5 min = 1 gallon to 50 gallons



## Potential Discharge Volume Based on A Little Math

For each failure mode…estimate the most likely release volume and rate

- Catastrophic failure:
  - Full capacity amount
- Overfills:
  - (Rate of filling) x (Likely time to recognize and shut off flow)
- Loading or unloading hose ruptures:
  - (Rate of filling [pump rate]) x (Likely time to recognize & shut off flow) + (Volume remaining in hose)
- Hose connection failures:
  - (Rate of filling) x (Likely time to recognize & shut off flow) + (Volume remaining in hose)
- Piping connection leaks/weeps:
  - Consider pressure, diameter, time to notice and time to correct
- Weeps/leaks from valves, fittings or gaskets:
  - Consider pressure, diameter, time to notice and time to correct
- Weeps/leaks from small structural defects or damage:
  - Consider pressure, type/magnitude of defect, time to notice and time to correct
- Portable tank/drum tip over during movement:
  - Time and ability to re-orient container or re-cap
- Spearing drums or IBCs with a forklift:
  - Leave forks IN… small volume vs pull forks OUT… larger volume



## Direction of Flow?

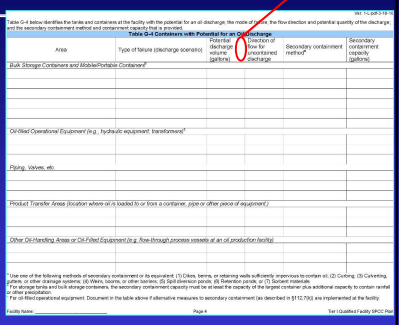
Determine the direction of flow

- SWPPP site maps are very helpful, if available…or
- Google earth aerials and elevations…o
- Walk the site etc.
- THIS IDENTIFIES WHAT NEED PROTECTION

## Then document all that in the Plan

Tier II and full PE Plans must also include Flow Rate (gpm or other)

- T-I G-4: Spill prediction
  - i.e. 'Containers with the potential for oil discharge'
  - Covers
    - Bulk tanks & containers
    - Oil filled equipment
    - Piping & valves
    - Product transfer & loading/unloading areas
    - Overall oil handling areas



Completed sample in a minute…

Let's Permeate Through Containment and Failure Analysis – Rev 1
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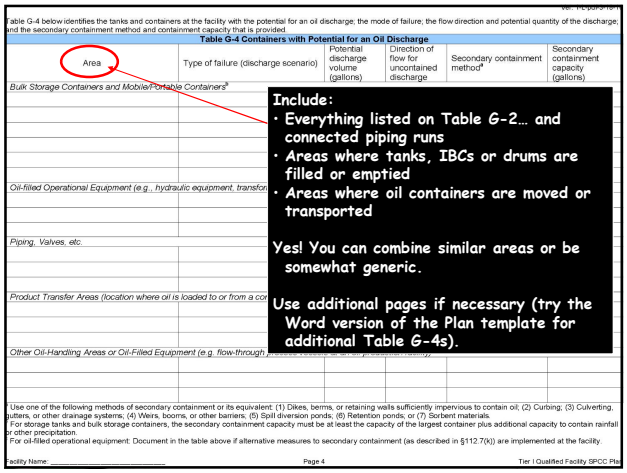
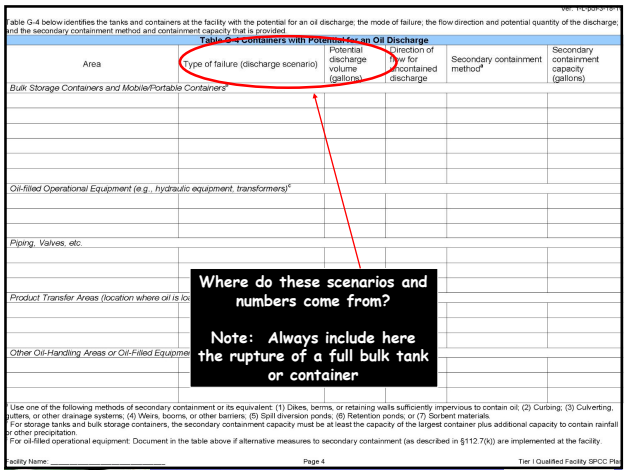


Include:
- Everything listed on Table G-2… and connected piping runs
- Areas where tanks, IBCs or drums are filled or emptied
- Areas where oil containers are moved or transported

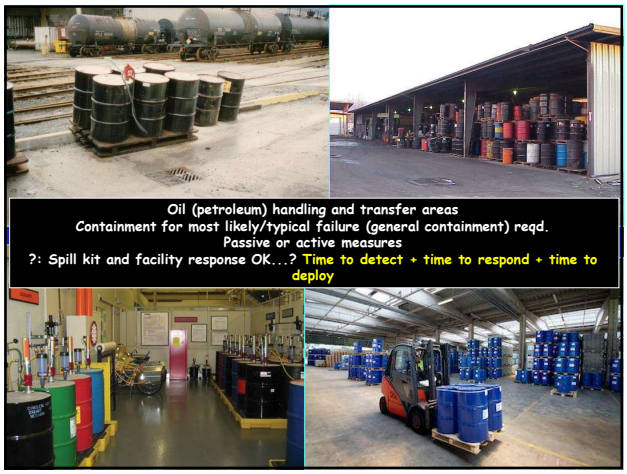
Yes! You can combine similar areas or be somewhat generic.

Use additional pages if necessary (try the Word version of the Plan template for additional Table G-4s).



Where do these scenarios and numbers come from?

Note: Always include here the rupture of a full bulk tank or container





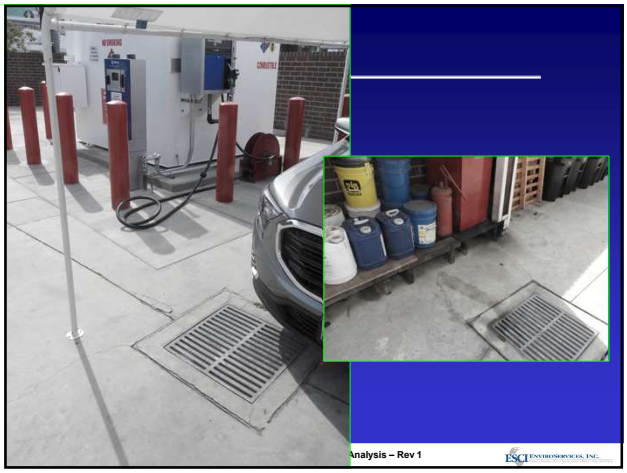




Table G-4 below identifies the tanks and containers at the facility with the potential for an oil discharge; the mode of failure; the flow direction and potential quantity of the discharge; and the secondary containment method and containment capacity that is provided.

**Table G-4 Containers with Potential for an Oil Discharge**

| Area | Type of failure (discharge scenario) | Potential discharge volume (gallons) | Direction of flow for uncontained discharge | Secondary containment method[a] | Secondary containment capacity (gallons) |
|---|---|---|---|---|---|
| *Bulk Storage Containers and Mobile/Portable Containers[b]* | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| *Oil-filled Operational Equipment (e.g., hydraulic equipment, transformers)[c]* | | | | | |
| | | | | | |
| | | | | | |
| *Piping, Valves, etc.* | | | | | |
| | | | | | |
| | | | | | |
| *Product Transfer Areas (location where oil is lo* | | | | | |
| | | | | | |
| | | | | | |
| *Other Oil-Handling Areas or Oil-Filled Equipme* | | | | | |
| | | | | | |
| | | | | | |

Then… complete the rest of the table.

Can state: 'spill kits/response measures' or 'collection trays' or sorbent pads/socks', etc. for general containment if applicable…

Remember: need 100% sized containment for bulk tanks & containers.

[a] Use one of the following methods of secondary cont… ring, gutters, or other drainage systems; (d) Weirs, booms, …
[b] For storage tanks and bulk storage containers, the secondary containment capacity must be at least the capacity of the largest container plus additional capacity to contain rainfall or other precipitation.
[c] For oil-filled operational equipment: Document in the table above if alternative measures to secondary containment (as described in §112.7(k)) are implemented at the facility.

Facility Name: _____ Page 4 Tier I Qualified Facility SPCC Pla…

| Area | Type of failure (discharge scenario) | Potential discharge volume (gallons) | Direction of flow for uncontained discharge | Secondary containment method[a] | Secondary containment capacity (gallons) |
|---|---|---|---|---|---|
| *Bulk Storage Containers and Mobile/Portable Containers[b]* | | | | | |
| Fuel tank T-1 | Complete failure of tank | 1 – 2,000 | South | Double wall tank | > 2,000 |
| Fuel tank T-2 | Complete failure of tank | 1 – 1,500 | South | Double wall tank | > 1,500 |
| Lube tank T-3 | Complete failure of tank | 1 – 950 | Southwest | Concrete dike | 1,100 |
| Lube tank T-4 | Complete failure of tank | 1 – 800 | Southwest | Concrete dike | 950 |
| Drums in DSA-1 | Complete rupture of drum | 1 – 55 | North | Concrete dike | 1,000 |
| Drums in DSA-2 | Complete rupture of drum | 1 – 55 | North | Containment pallets | 62 each pallet |
| Drums in HW-1 | Complete rupture of drum | 1 – 55 | East | Concrete dike | 800 |
| Drums in GSDS-1 | Complete rupture of drum | 1 – 55 | Northeast | Containment pallets | 62 each pallet |
| *Oil-filled Operational Equipment (e.g., hydraulic equipment, transformers)[c]* | | | | | |
| Hydraulic presses | Hydraulic hose leak or fitting rupture | < 5 | South | Active spill response with oil sorbents | Appx. 25 |
| Machining equipment | Oil hose/fitting leak or rupture | < 5 | South | Steel spill tray | 15 |
| *Piping, Valves, etc.* | | | | | |
| | | | | | |
| *Product Transfer Areas (location where oil is loaded to or from a container, pipe or other piece of equipment.)* | | | | | |
| Fuel tank T-1 and T-2 loading areas | Tank overfill | 1 – 60 | South | Drain cover & spill sorbents | At least 60 |
| Fuel tank T-1 and T-2 loading areas | Tanker loading hose rupture | 1 – 60 | South | Drain cover & spill sorbents | At least 60 |
| Lube tank T-3 loading/transfer area | Tank overfill | 1 – 30 | Southwest | Drain cover & spill sorbents | At least 30 |
| Lube tank T-3 loading/transfer area | Tanker loading hose rupture | 1 – 30 | Southwest | Drain cover & spill sorbents | At least 30 |
| Lube tank T-4 loading/transfer area | Tank overfill | 1 – 30 | East | Drain cover & spill sorbents | At least 30 |
| Lube tank T-4 loading/transfer area | Tanker loading hose rupture | 1 – 30 | East | Drain cover & spill sorbents | At least 30 |
| Hazardous waste drum area HW-1 | Spill during drum filling | 1 - 5 | East | Concrete dike | 800 |
| | | | | | |
| *Other Oil-Handling Areas or Oil-Filled Equipment (e.g. flow-through process vessels at an oil production facility)* | | | | | |
| | | | | | |

**Sample for Class**

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## Failure Analysis (examples)

You want THIS number to be less than the capacity of your spill kit, your containment, etc.

New Pig Spill Kit in 20 Gallon Overpack Salvage Drum | Absorbs up to 12 Gallons White | KIT211

$216.00

- UN RATED for shipping waste after spill cleanup
- COMPLY WITH SPILL PLAN REGS, avoid fines and be ready to respond
- ABSORB & STOP SPREADING SPILLS by using PIG Blue Socks, PIG Mats and Pillows
- NEATLY PREPACKED CONTAINER speeds access during a spill emergency
- OVERPACK IS X-RATED in Packing Groups I, II and III for shipping spill cleanup waste by land, sea or rail

**Table G-4 Containers with Potential for an Oil Discharge**

| Area/Container | Type of Failure/Discharge Scenario | Potential Discharge Volume (gallons) | Direction of Flow | Secondary Containment Method | Secondary Containment Capacity (gallons) |
|---|---|---|---|---|---|
| *Bulk Storage Containers & Mobile/Portable Containers (including associated piping systems and tank loading areas)* | | | | | |
| Fleet Product Oil Tanks # 1 - 6 | Tank rupture | 250 | Out Fluid/Oil Room (or out piping within shop) and • Into shop and catch drains at roll-up doors, or • Out building to paved area then down to street and municipal storm drain | Double-wall tank | >250 |
| | Piping rupture | 1 – 25 | | | |
| | Loading hose/connection failure during tank loading | 1 – 25 | | Spill absorbents & active measures/spill response; roll-up door catch drains | Up to 30 |
| Fleet Used Oil Tank | Tank rupture | 500 | Out Fluid/Oil Room (or out piping within shop) and • Into shop and catch drains at roll-up doors, or • Out building to paved area then down to street and municipal storm drain | Double-wall tank | >500 |
| | Piping rupture | 1 – 25 | | | |
| | Loading hose/connection failure during tank loading or unloading | 1 – 25 | | Spill absorbents & active measures/spill response; roll-up door catch drains | Up to 30 |
| Fleet Oil/Grease Drums | Drum rupture | 55 | Into shop and catch drains at roll-up doors | Containment pallets or units | >55 |
| | Spill during filling/transfer | 1 - 10 | | Spill absorbents & active measures/spill response; roll-up door catches drains | Up to 30 |

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| Area/Container | Type of Failure/Discharge Scenario | Potential Discharge Volume (gallons) | Direction of Flow | Secondary Containment | Secondary Containment Capacity (gallons) |
|---|---|---|---|---|---|

Why the difference?

| Potential Event | Maximum Potential Release Volume (gallons)[4] | Maximum Potential Discharge Rate[5] | Direction of Flow[6] | Secondary Containment or Other Spill Diversion |
|---|---|---|---|---|
| Est. 5 min. to detect, respond and stop flow. | | | | |
| **…ne Storage Tanks (ID # T-1 & 2) – Bulk Storage Container** | | | | |
| Failure of AST (collapse or puncture below liquid level) | 5,000 or 10,000 max | Gradual to instantaneous | Onto concrete or asphalt ground surface then slightly north then west then immediately southwest across concrete CNG fueling apron to storm channel, then south to mid-property | Integral double wall tanks, product tight loading box, spill response supplies & response. |
| Tank overfill | 60 | 120 gal/min | | |
| Piping failure | 100 | 20 gal/min | | |
| Loading or unloading hose failure during tank loading | 60 | 120 gal/min | | |
| **Misc. Motor, Lube, Gear Oil and/or Hydraulic Fluid or Used Oil Storage/Dispensing Drums (ID # GB) – Portable Bulk Storage Containers** | | | | |
| Leak or failure of drum or tote | 55 max | Gradual to instantaneous | Onto concrete floor inside building then north to mid property (in ran events – continue north then west then immediately southwest across concrete CNG fueling apron to storm channel, then south to mid-property | Secondary containment pallets, and/or spill response supplies & response (for attended drums in facility use). |
| Dispensing or transfer hose failure | 2 | 5 gal/min | | |

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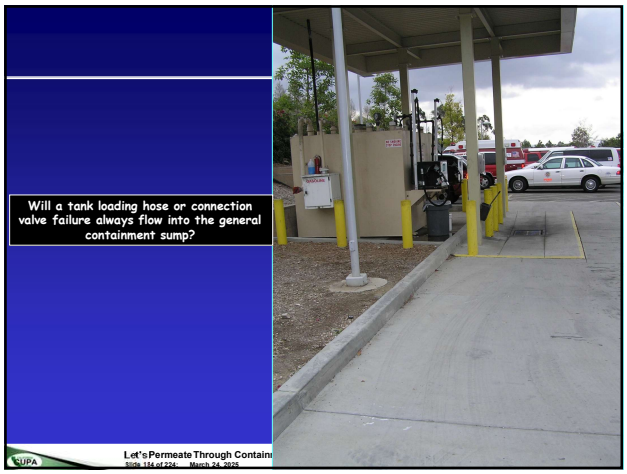
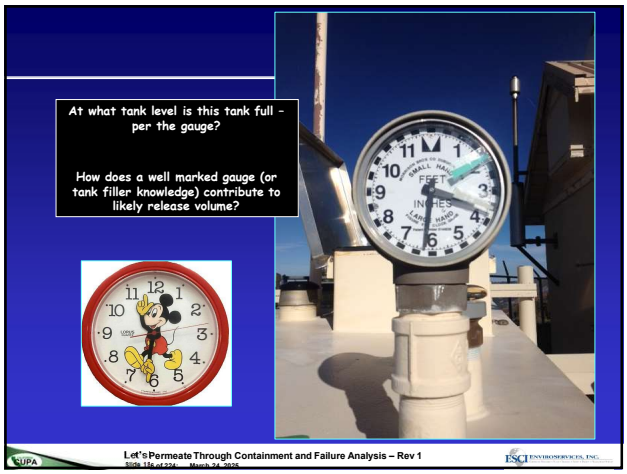
Spill supplies ('DRIZIT') staged at the tank loading/unloading area.
Plan states typical failure mode, volume and rate is loading hose rupture with 60 gallons released (30 seconds to respond at 120 gpm pump rate).
Flow direction (per Plan) is down-gradient to the left.
Must evaluate whether the 1/3 barrel of 'DRIZIT' is sufficient, and whether other containment method(s) are used.


Likely release volume from these old, plastic valves?







## More failure mode examples

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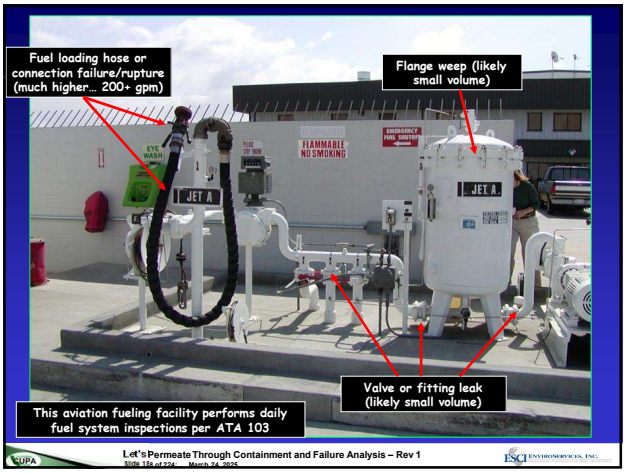


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## The Universally Sketchy Assumption

- Can assume that inspection & response procedures would be followed (and all required supplies are present)… whether they ARE OR NOT is an implementation and inspection issue
  - ACTION!

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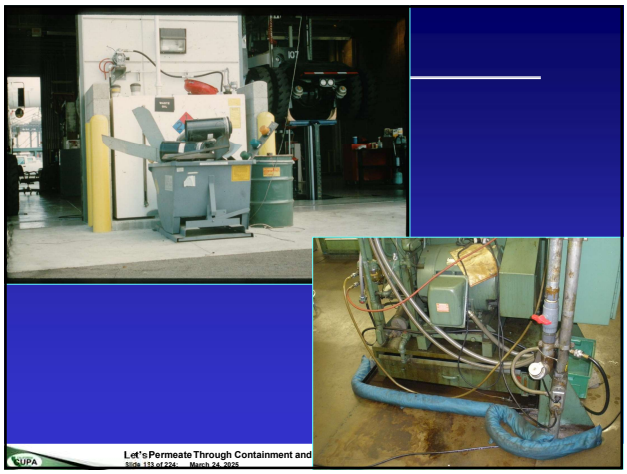


## Failure Analysis or Spill Prediction

- Facility not 'required' to include the basis, reasoning or justification for the data included or failure modes not included
  - Some plans do include
    - Detailed engineering calculations, and/or
    - Basis for the numbers and scenarios used, or
    - Just a list of scenarios and a number
  - Some plans simply a number
  - Facility and inspector can always request the backup (or basis) to verify
    - The facility should always understand what these numbers are based on!
- Should be a table or description in SPCC Plan

Let's Permeate Through Containment and Failure Analysis – Rev 1

| Area | Type of failure (discharge scenario) | Potential discharge volume (gallons) | Direction of flow for uncontained discharge | Secondary containment method[a] | Secondary containment capacity (gallons) |
|---|---|---|---|---|---|
| *Bulk Storage Containers and Mobile/Portable Containers[b]* | | | | | |
| Fuel tank T-1 | Complete failure of tank | 1 – 2,000 | South | Double wall tank | > 2,000 |
| Fuel tank T-2 | Complete failure of tank | 1 – 1,500 | South | Double wall tank | > 1,500 |
| Lube tank T-3 | Complete failure of tank | 1 – 950 | Southwest | Concrete dike | 1,100 |
| Lube tank T-4 | Complete failure of tank | 1 – 800 | Southwest | Concrete dike | 950 |
| Drums in DSA-1 | Complete rupture of drum | 1 – 55 | North | Concrete dike | 1,000 |
| Drums in DSA-2 | Complete rupture of drum | 1 – 55 | North | Containment pallets | 62 each pallet |
| Drums in HW-1 | Complete rupture of drum | 1 – 55 | East | Concrete dike | 800 |
| Drums in GSDS-1 | Complete rupture of drum | 1 – 55 | Northeast | Containment pallets | 62 each pallet |
| *Oil-filled Operational Equipment (e.g., hydraulic equipment, transformers)[c]* | | | | | |
| Hydraulic presses | Hydraulic hose leak or fitting rupture | < 5 | South | Active spill response with oil sorbents | Appx. 25 |
| Machining equipment | Oil hose/fitting leak or rupture | < 5 | South | Steel spill tray | 15 |
| *Piping, Valves, etc.* | | | | | |
| | | | | | |
| *Product Transfer Areas (location where oil is loaded to or from a container, pipe or other piece of equipment.)* | | | | | |
| Fuel tank T-1 and T-2 loading areas | Tank overfill | 1 – 60 | South | Drain cover & spill sorbents | At least 60 |
| Fuel tank T-1 and T-2 loading areas | Tanker loading hose rupture | 1 – 60 | South | Drain cover & spill sorbents | At least 60 |
| Lube tank T-3 loading/transfer area | Tank overfill | 1 – 30 | Southwest | Drain cover & spill sorbents | At least 30 |
| Lube tank T-3 loading/transfer area | Tanker loading hose rupture | 1 – 30 | Southwest | Drain cover & spill sorbents | At least 30 |
| Lube tank T-4 loading/transfer area | Tank overfill | 1 – 30 | East | Drain cover & spill sorbents | At least 30 |
| Lube tank T-4 loading/transfer area | Tanker loading hose rupture | 1 – 30 | East | Drain cover & spill sorbents | At least 30 |
| Hazardous waste drum area HW-1 | Spill during drum filling | 1 - 5 | East | Concrete dike | 800 |
| | | | | | |
| *Other Oil-Handling Areas or Oil-Filled Equipment (e.g. flow-through process vessels at an oil production facility)* | | | | | |
| | | | | | |

**Sample for Class**

Page 4

Tier I Qualified Facility SPCC Plan

## I hate that table…..

Table G-4 below identifies the tanks and containers at the facility with the potential for an oil discharge; the mode of failure; the flow direction and potential quantity of the discharge; and the secondary containment method and containment capacity that is provided.

**Table G-4 Containers with Potential for an Oil Discharge**

| Area | Type of failure (discharge scenario) | Potential discharge volume (gallons) | Direction of flow for uncontained discharge | Secondary containment method[a] | Secondary containment capacity (gallons) |
|---|---|---|---|---|---|
| *Bulk Storage Containers and Mobile/Portable Containers[b]* | | | | | |
| | *See following pages* | | | | |
| *Oil-filled Operational Equipment (e.g., hydraulic equipment, transformers)[c]* | | | | | |

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## Spill Prediction (examples using my own format)

**Table 6-2 Spill Prediction**

| Potential Event | Maximum Potential Release Volume (gallons)[1] | Maximum Potential Discharge Rate[2] | Direction of Flow[3] | Secondary Containment |
|---|---|---|---|---|
| **Recycled/Recyclable Oil Tanks RO-T 1 through 5** | | | | |
| Failure of AST (collapse or puncture below liquid level) | 1,900 max | Gradual to instantaneous | North via swales to o/w separator to infiltration area | Concrete secondary containment |
| Tank overfill | 60 | 20 gal/min | | |
| Piping failure | 50 | 5 gal/min | | |
| Loading or unloading hose failure | 60 | 20 gal/min | | |
| **Used Oil Tank UO-T 2** | | | | |

[1] As of January 2009 – Calif. OES became the California Emergency Management Agency.
[2] Maximum potential release volume based on the estimated time required to detect a release associated with the identified event and to shut off the flow or isolate the equipment multiplied by the maximum potential discharge rate for that event. Discharge rate factors assume trained vendor and facility personnel following relevant procedures for managing leaks or spills, and leaks from operational equipment occurring during facility operational hours.
[3] Maximum potential discharge rate determined from engineering experience, pump rates as determined through experience or discussions with delivery or recycling vendors. Discharge volume factors assume trained vendor and facility personnel following relevant procedures for managing leaks or spills.
[4] Assumes containment breach – no matter how unlikely.

| Potential Event | Maximum Potential Release Volume (gallons) | Maximum Potential Discharge Rate | Direction of Flow | Secondary Containment |
|---|---|---|---|---|
| *#3 Oils Cones Box* | | | | |
| Failure of aboveground tank (collapse or puncture below product level) | 500 | Gradual to instantaneous | N to low spot in yard | Steel secondary containment |
| Tank overfill | 5 to 50 | 5 gal/min | N to low spot in yard | Steel secondary containment; line inspection before use, & spill kit |
| Loading or unloading line failure | 5 to 50 | 5 gal/min | N to low spot in yard | Partial secondary containment, line inspection before use, & spill kit |
| *Fuels Area Tanks #4 and 5* | | | | |
| Failure of aboveground tank (collapse or puncture below product level) | 330 - 550 | Gradual to instantaneous | N to drainage ditch on highway | Secondary containment |
| Tank overfill | 5 to 50 | 5 gal/min | N to drainage ditch on highway | Secondary containment |
| Loading or unloading line failure | 5 to 50 | 5 gal/min | N to drainage ditch on highway | Partial secondary containment, line inspection before use, & spill kit |
| *Fuels Area Tanks #6, 7, and 8* | | | | |
| Failure of aboveground tank (collapse or puncture below product level) | 1,000 to 3,000 | Gradual to instantaneous | N to drainage ditch on highway | Secondary containment |
| Tank overfill | 5 to 50 | 5 gal/min | N to drainage ditch on highway | Secondary containment, fill procedures & spill kit |
| Loading or unloading line failure | 5 to 50 | 5 gal/min | N to drainage ditch on highway | Partial secondary containment, line inspection before use, & spill kit |
| *Fuel Trucks #9 and 10* | | | | |
| Failure of Tank on truck | 55 to 750 | Gradual to instantaneous | N to drainage ditch on highway (mobile variable locations) | Secondary containment on vehicle, spill kits |
| Tank overfill | 5-50 | 5 gal /min | N to drainage ditch on highway (mobile) | Secondary containment on vehicle, spill kits |
| Loading or unloading line failure | 1 to 500 | 5 gal/min | N to drainage ditch on highway (mobile) | Secondary containment on vehicle, line inspection before use & spill kits |

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## Drainage Controls (from containment areas)

- **Objective: Prevent oil-contaminated water from escaping the facility and becoming a harmful navigable water discharge**
  - Storm water permitting and storm water pollution prevention plan restrictions are essentially the same

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## Draining Containment to a Treatment System

- Containment areas may be drained or pumped out into facility drainage or effluent treatment systems only if the treatment system is designed to control oil discharges to waterways
  - e.g. oil/water separation and oil/water clarifier treatment systems
    - They must be specifically designed to handle and remove oil
    - They must be properly maintained


Oil/Water Separator
Inspection and Maintenance Checklist

Facility: _____ Inspected By: _____

Separator ID#: _____ Date: _____

Separator Location: _____

| AREA | INSPECTION ITEMS | |
|---|---|---|
| OIL/WATER SEPARATORS | Distance from the rim of the access cover to the bottom of the structure | _____ (reference depth) |
| | Distance from the rim of the access cover to the top of the sediment/sludge | _____ (measured depth) |
| | Depth of accumulated sediment | Actual: _____ |
| | Distance from the rim of the access cover to the oil/water interface | _____ (measured depth) |
| | Distance from the rim of the access cover to the top of the liquid surface | _____ (reference depth) |
| | Depth of accumulated oil | Actual: _____ |

| | INSPECTION ITEM | Yes | No | Comments |
|---|---|---|---|---|
| GOOD HOUSEKEEPING | Are the areas near drains kept free of debris and sediment? | | | |
| | Are drip pans used under vehicles and spigots? | | | |
| | Are spill absorbent materials readily available? | | | |
| | Are floors kept clean and spill materials cleaned up in a timely manner? | | | |
| | Is oil/water separator cleaning required? | | | |
| ACTION TAKEN TO BE TAKEN | If yes, note: Who cleaned the separator: _____ The date the separator was cleaned: _____ The volume of liquid pumped: _____ The volume of sludge removed?: _____ The method of disposal: _____ | | | |

OTHER COMMENTS:

Note: If a check mark is made in a shaded box, corrective action is necessary.

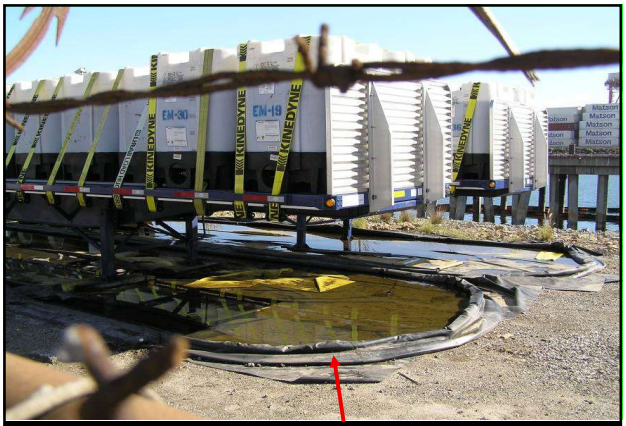
Completed checklists must be kept at the facility for at least 3 years.



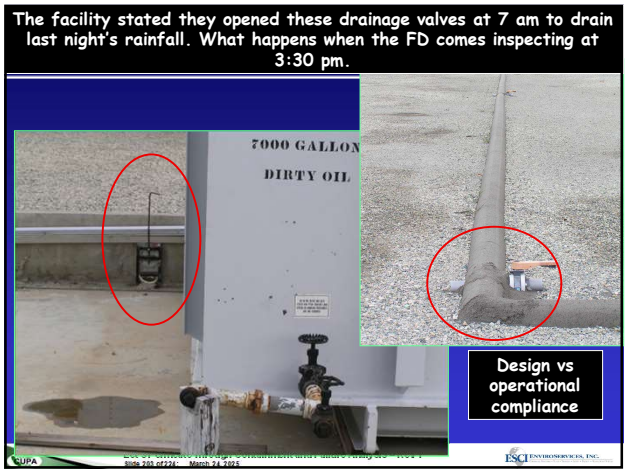
## Is Draining Containment *Required*?

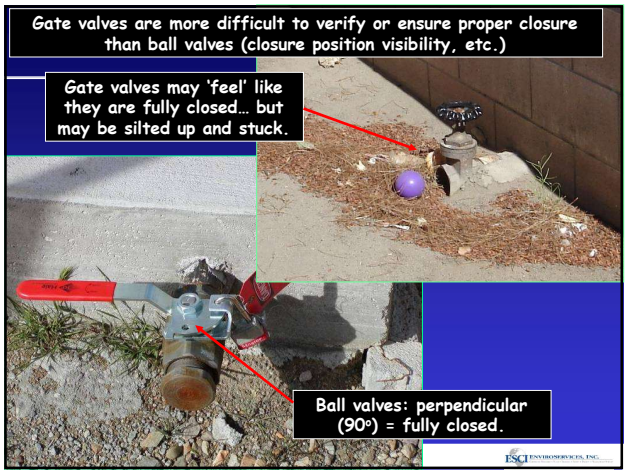
- Yes: If there is oil in the containment
  - 40 CFR 112.8(c)(10) requires prompt removal of accumulations of oil in secondary containment
- No: If there is just water (e.g. storm water) in the containment
  - Must assure there is still sufficient freeboard for precipitation
  - And that the storm water is free of sheen




As more liquid accumulates in this containment – the containment walls expand/rise to a max. 12"



## Page 9 G-10 Detail: Drainage of Uncontaminated Rainwater from Diked Areas

If uncontaminated rainwater from diked areas drains into a storm drain or open watercourse the following procedures will be implemented at the facility: *[§§112.8(c)(3) and 112.12(c)(3)]*

- Bypass valve is normally sealed closed
- Retained rainwater is inspected to ensure that its presence will not cause a discharge to navigable waters or adjoining shorelines
- Bypass valve is opened and resealed under responsible supervision
- Adequate records of drainage are kept **[See Dike Drainage Log in Attachment 3.3]**

For completely buried metallic tanks installed on or after January 10, 1974 at this facility *[§§112.8(c)(4)*

- These requirements apply IF you drain contained stormwater directly to the storm water drain, creek or stream
  - If you always let it evaporate or percolate into containment (dirt/gravel) floor – these will not apply
- These are consistent with SWPPP requirements
  - ✦Do you have a SWPPP?
- Must ensure you follow all four requirements
  - ✦Make sure personnel are properly trained

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## Page 18 (Attachment 3.3, Table G-18) Dike Drainage Log

Ver. 1-L-pdf-3-18-10

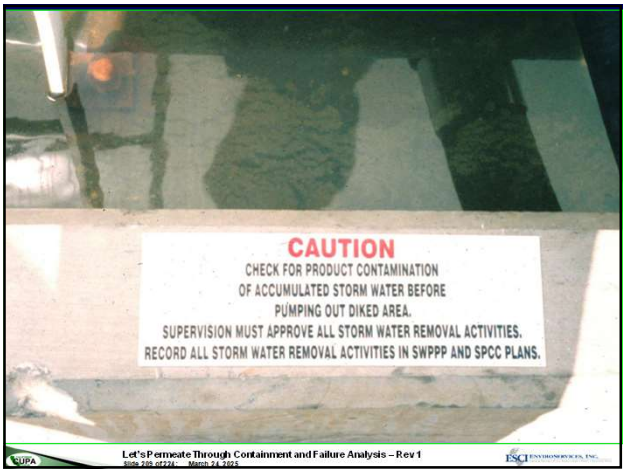
ATTACHMENT 3.3 – Dike Drainage Log

Table G-18 Dike Drainage Log

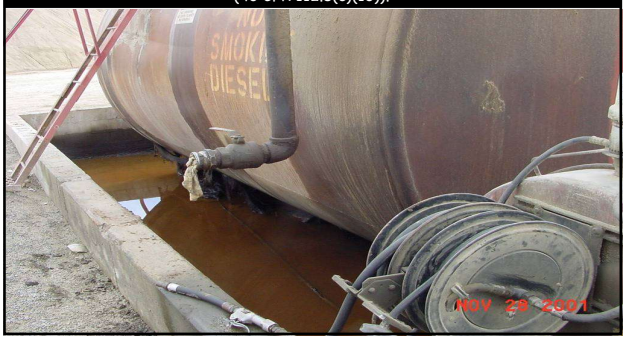
| Date | Bypass valve sealed closed | Rainwater inspected to be sure no oil (or sheen) is visible | Open bypass valve and reseal it following drainage | Drainage activity supervised | Observations | Signature of Inspector |
|---|---|---|---|---|---|---|
| | ☐ | ☐ | ☐ | ☐ | | |
| | ☐ | ☐ | ☐ | ☐ | | |
| | ☐ | ☐ | ☐ | ☐ | | |
| | ☐ | ☐ | ☐ | ☐ | | |
| | ☐ | ☐ | ☐ | ☐ | | |
| | ☐ | ☐ | ☐ | ☐ | | |
| | ☐ | ☐ | ☐ | ☐ | | |
| | ☐ | ☐ | ☐ | ☐ | | |

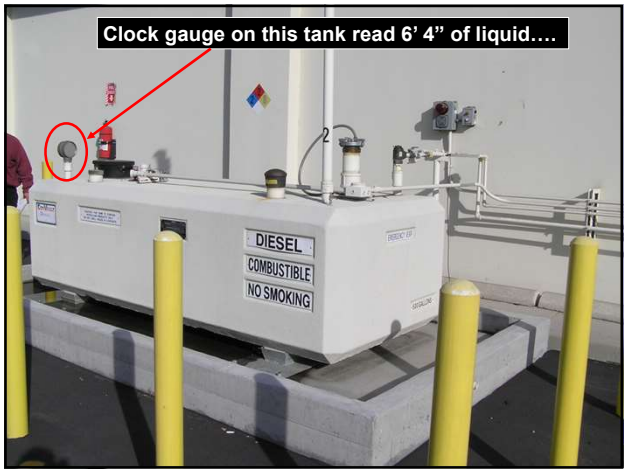
Can also use whatever similar form you use for your SWPPP compliance

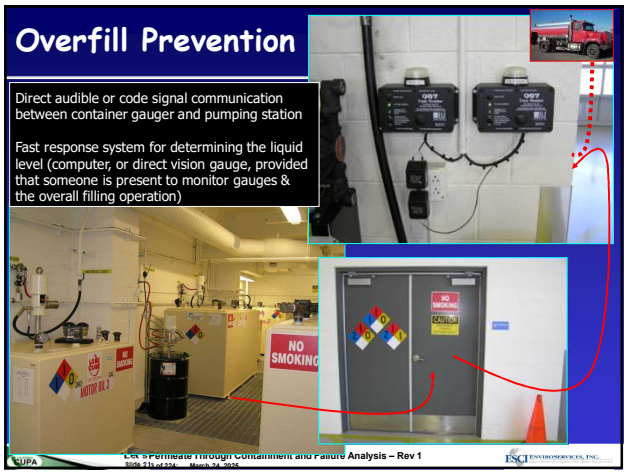
Facility Name: Page 18 This Qualified Facility SPCC Plan

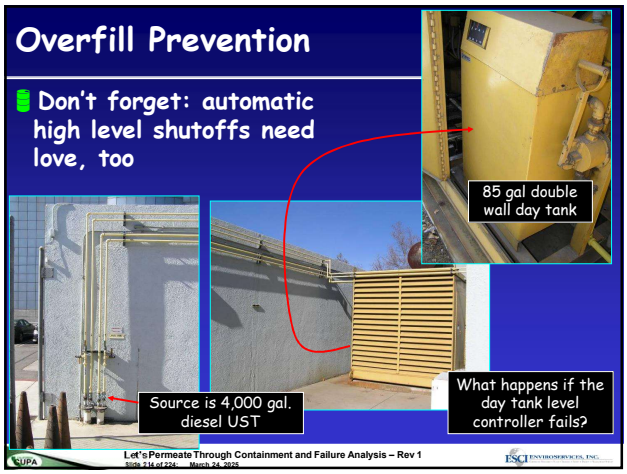



For some containment dikes/areas… there is so much oil residue, the facility would never be able to simply discharge the contained water in compliance. They could contain it as a waste, however. Letting it just accumulate may adversely impact the available containment volume. This facility is likely not complying with requirement to frequently inspect for accumulation of oil inside diked areas (40 CFR 112.8(c)(6) or prompt removal of oil accumulation in diked areas (40 CFR 112.8(c)(10)).

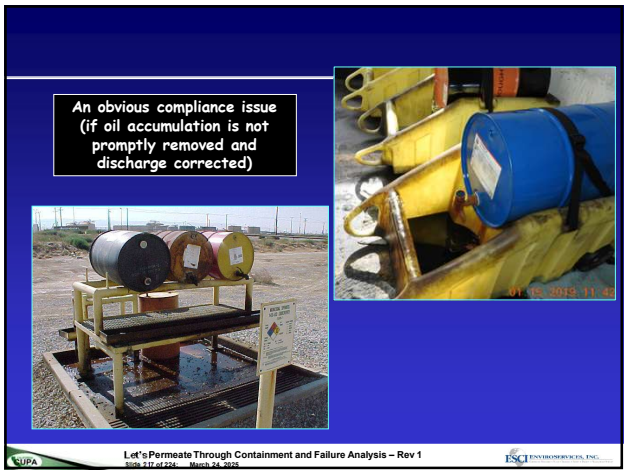


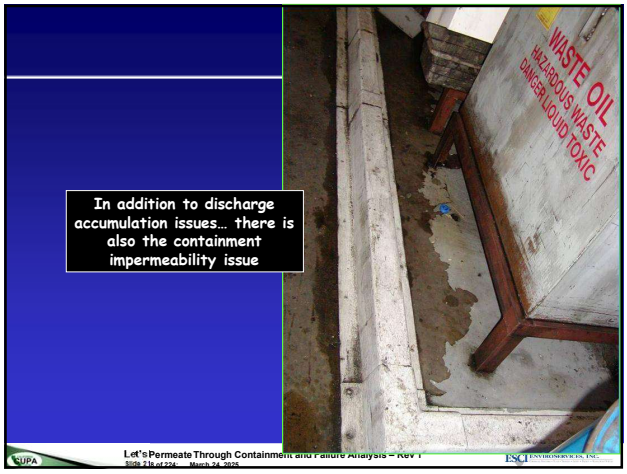



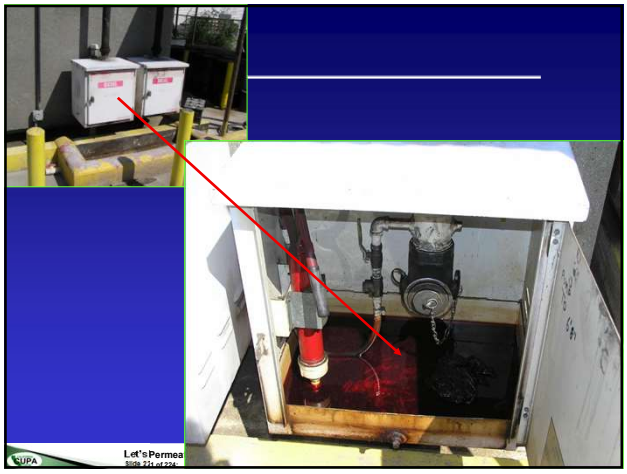










## Final Thoughts