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

Fill-In Session M-G3

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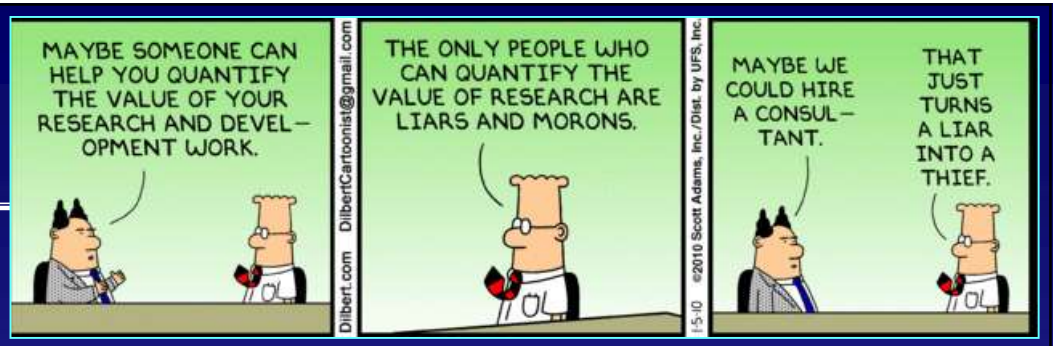
Introductions



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))
Portable/mobile bulk containers (except mobile refuelers & NTRTTs)	Aboveground storage tank	Sized (100% capacity) containment + precipitation freeboard (112.6(a)(3)(ii))		Systems or written procedures for overfill prevention (112.6(a)(3)(iii)) Position to prevent nav. water discharge (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.

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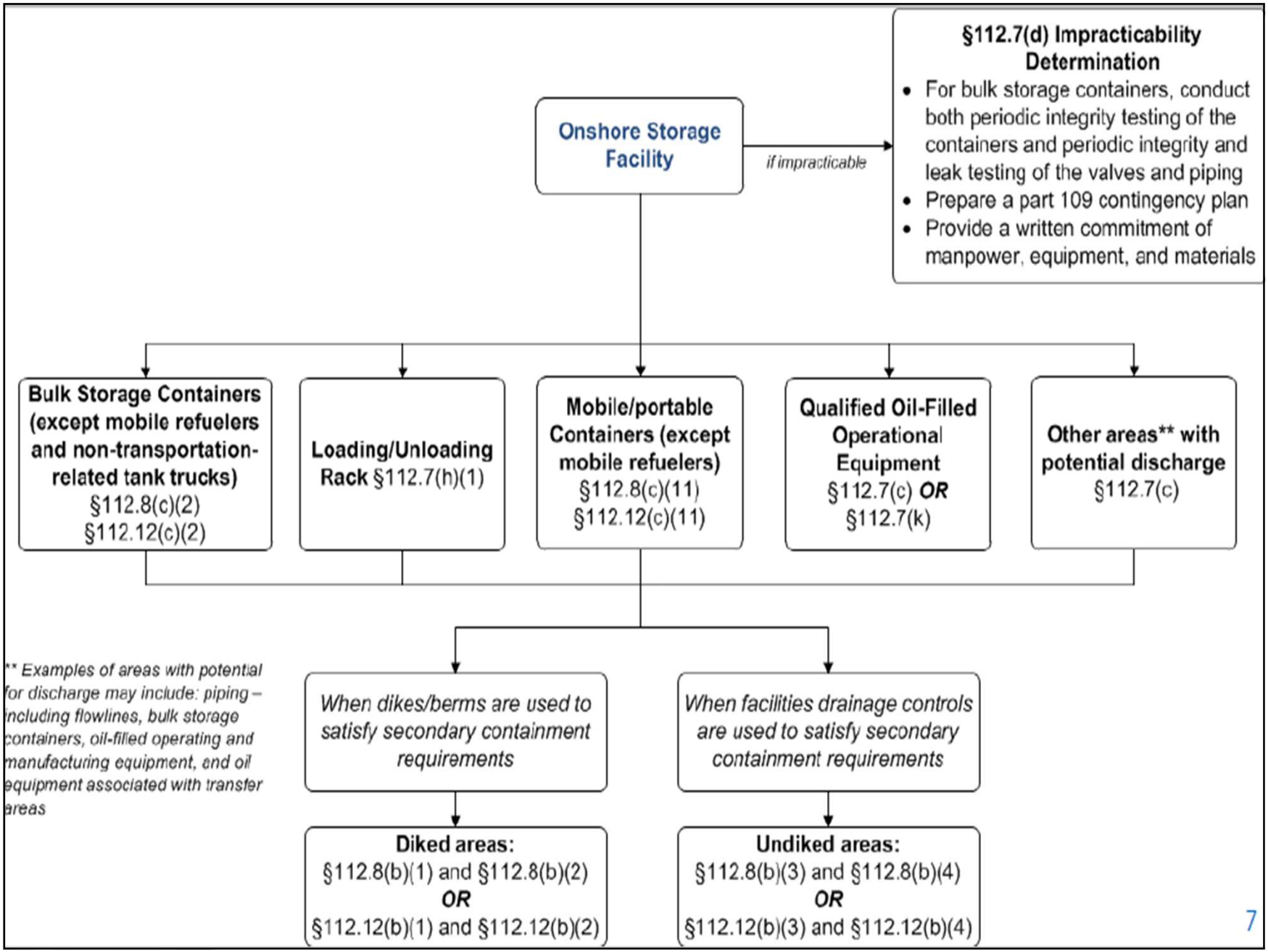
What Needs "Containment" per APSA?

- 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**



Bulk storage containers (stationary ASTs) & portable bulk containers (drums)

Bulk storage container (stationary AST)

Portable bulk container (mobile refueler)

Oil-filled operational equipment

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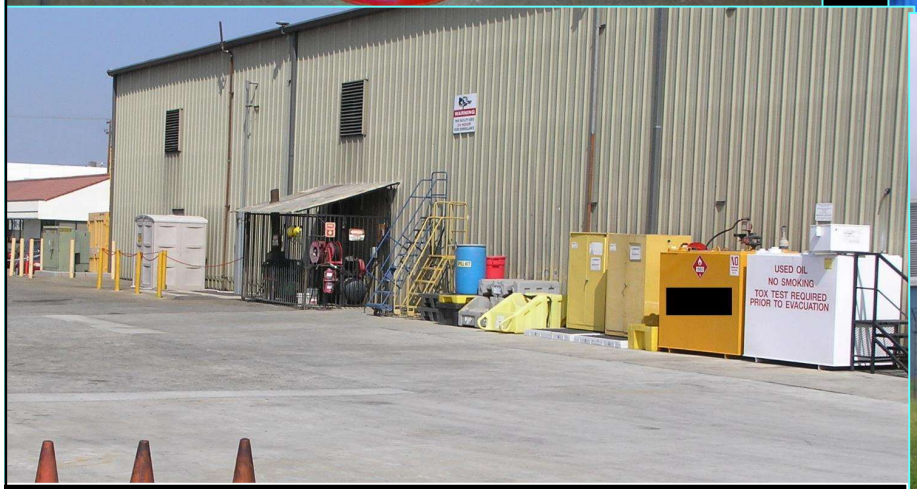
Slide 12 of 224; March 24, 2025

Portable bulk containers (drums)

Oil-filled operational or manufacturing equipment



Bulk storage containers (stationary ASTs) & portable bulk containers (drums)… and oil transfer area

Oil-filled electrical equipment

Oil (petroleum) transfer areas (piping)

'Motive' Power Container?

- Tanks used as motive fuel tanks are not APSA or SPCC regulated

THIS fuel tank obviously not being used as a motive fuel tank… so it may be regulated if it is being used as storage (unless it is empty while dismounted).

Hydraulic systems (> 55 gal.) on mobile equipment would be exempt as a 'ancillary on-board oil-filled equipment'… even when the mobile crane is parked at the storage yard

What about vehicles with lube, hydraulic, and/or fuel distribution/dispensing systems and containers? Are these exempt as 'ancillary on-board oil-filled equipment'? Are these non-transportation-related tank trucks?

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

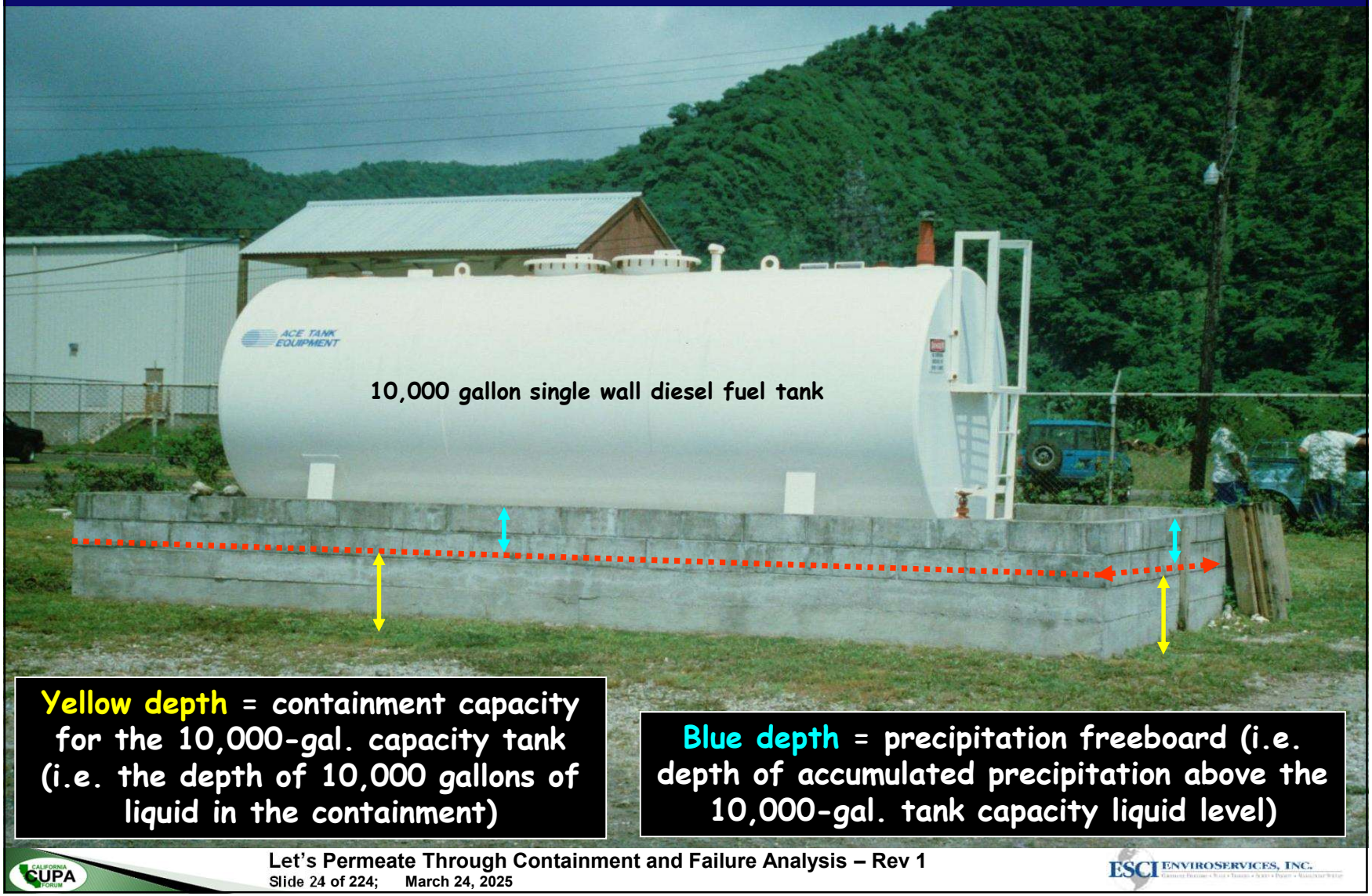
Sized containment:

- 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

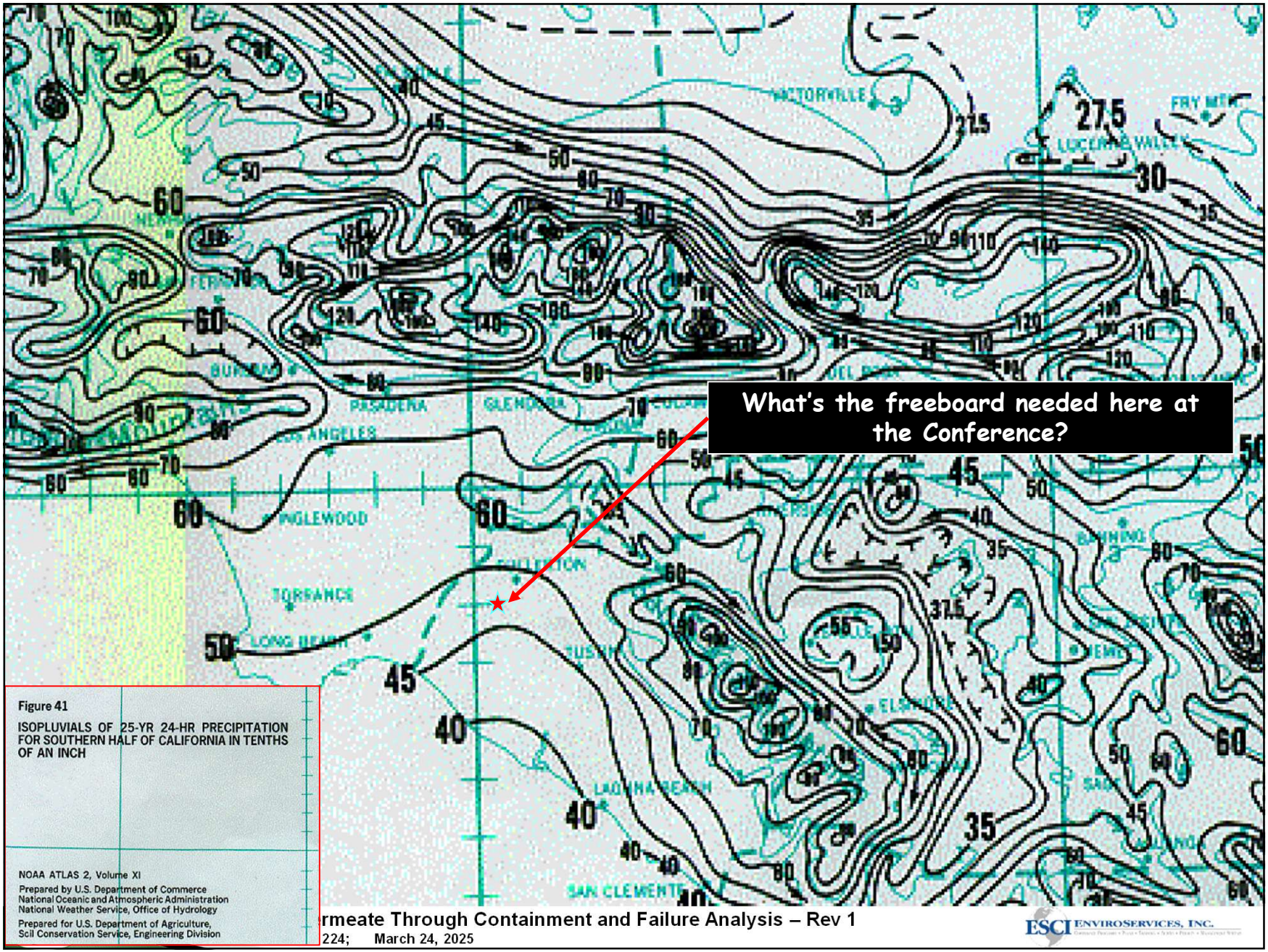
- Only applicable to bulk tanks or containers
  - Not required for oil filled equipment, piping, or transfer areas
- Only if exposed to rain fall
  - … not required for integral double wall tanks, tanks under roof or inside buildings
    - ✦Sprinkler flow containment is a fire code requirement – not 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!

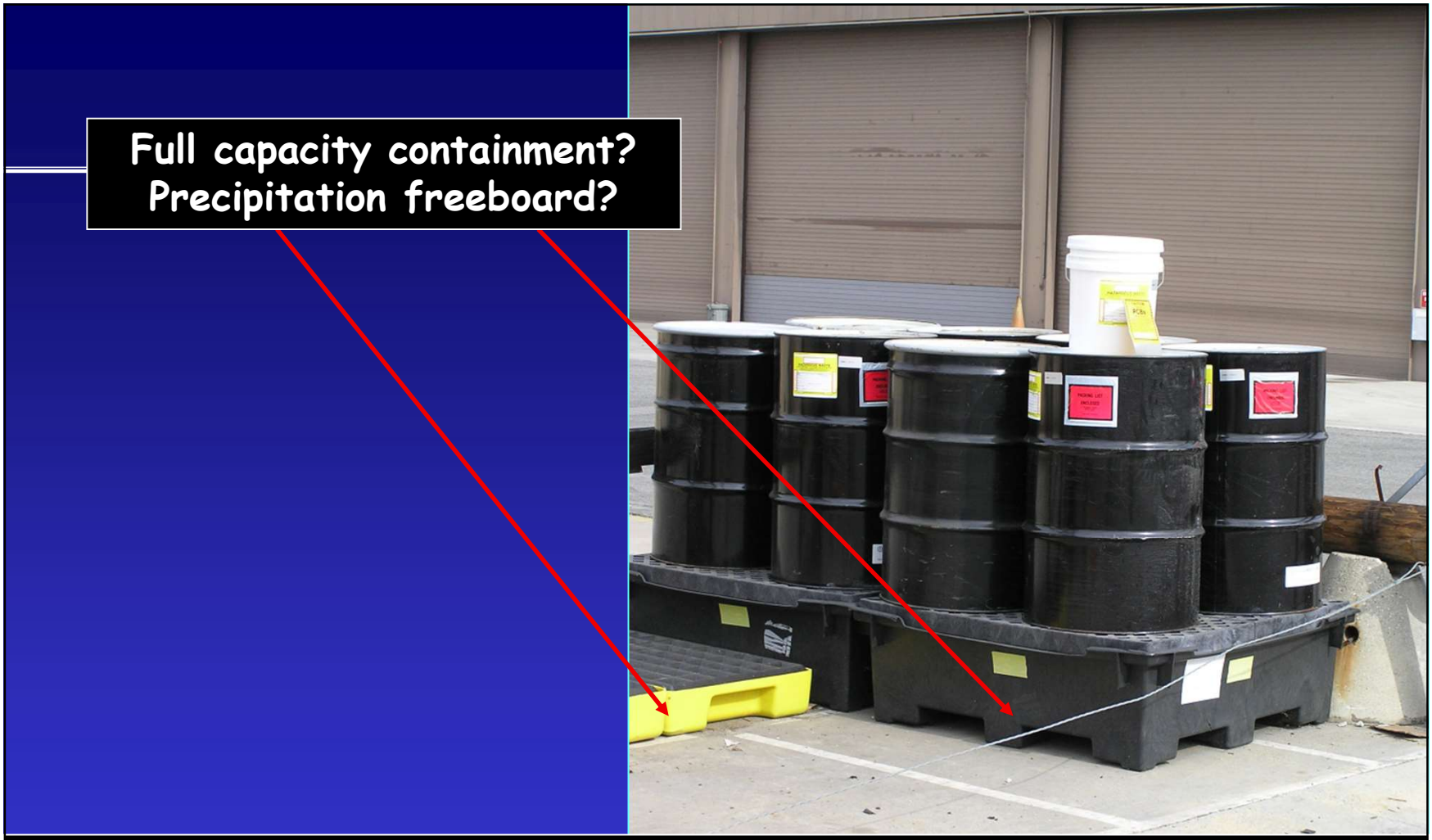
Freeboard = Containment Depth for Rainfall Accumulation



Yellow depth = containment capacity for the 10,000-gal. capacity tank (i.e. the depth of 10,000 gallons of liquid in the containment)

Blue depth = precipitation freeboard (i.e. depth of accumulated precipitation above the 10,000-gal. tank capacity liquid level)





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.

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Capacity of Largest Container/Tank

Don't forget precipitation freeboard and displacement

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Outdoor Coverage

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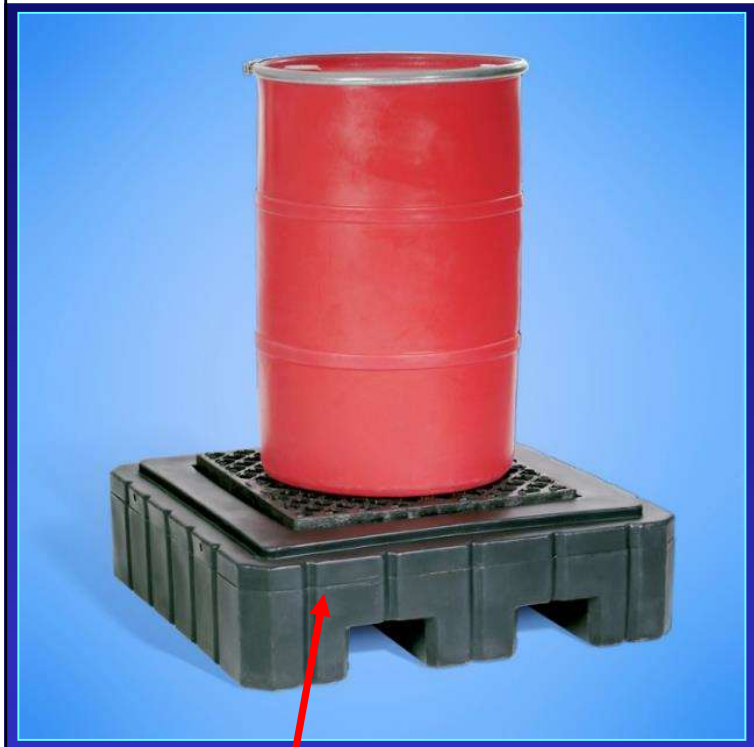
Slide 30 of 224; March 24, 2025

Need to Assure & Verify Proper Containment



61-gallon liquid capacity with drum in place

5-gallon liquid capacity with drum in place

11-gallon liquid capacity with drum in place

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Slide 31 of 224; March 24, 2025

Would these sorbent socks provide this oil drum storage area with proper sized containment?

Or do they need berms, curbs, dikes, etc.?

The sock placement also does not render the containment impervious.

Are these:

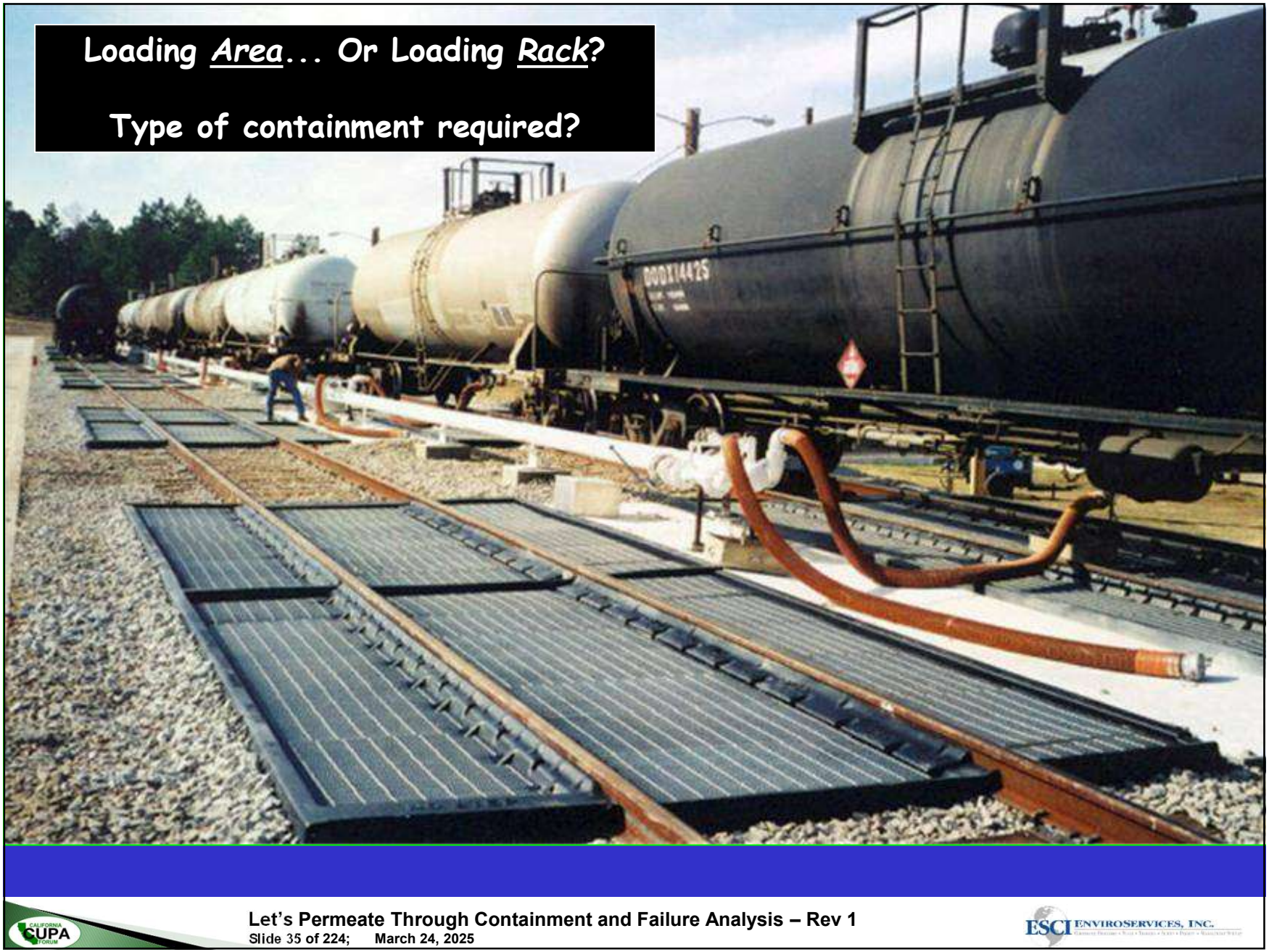
A) Mobile refuelers
B) Non-transportation tank trucks
C) Portable bulk storage containers
D) Oil-filled operational equipment

Type of containment required?

Kilroy Lichten

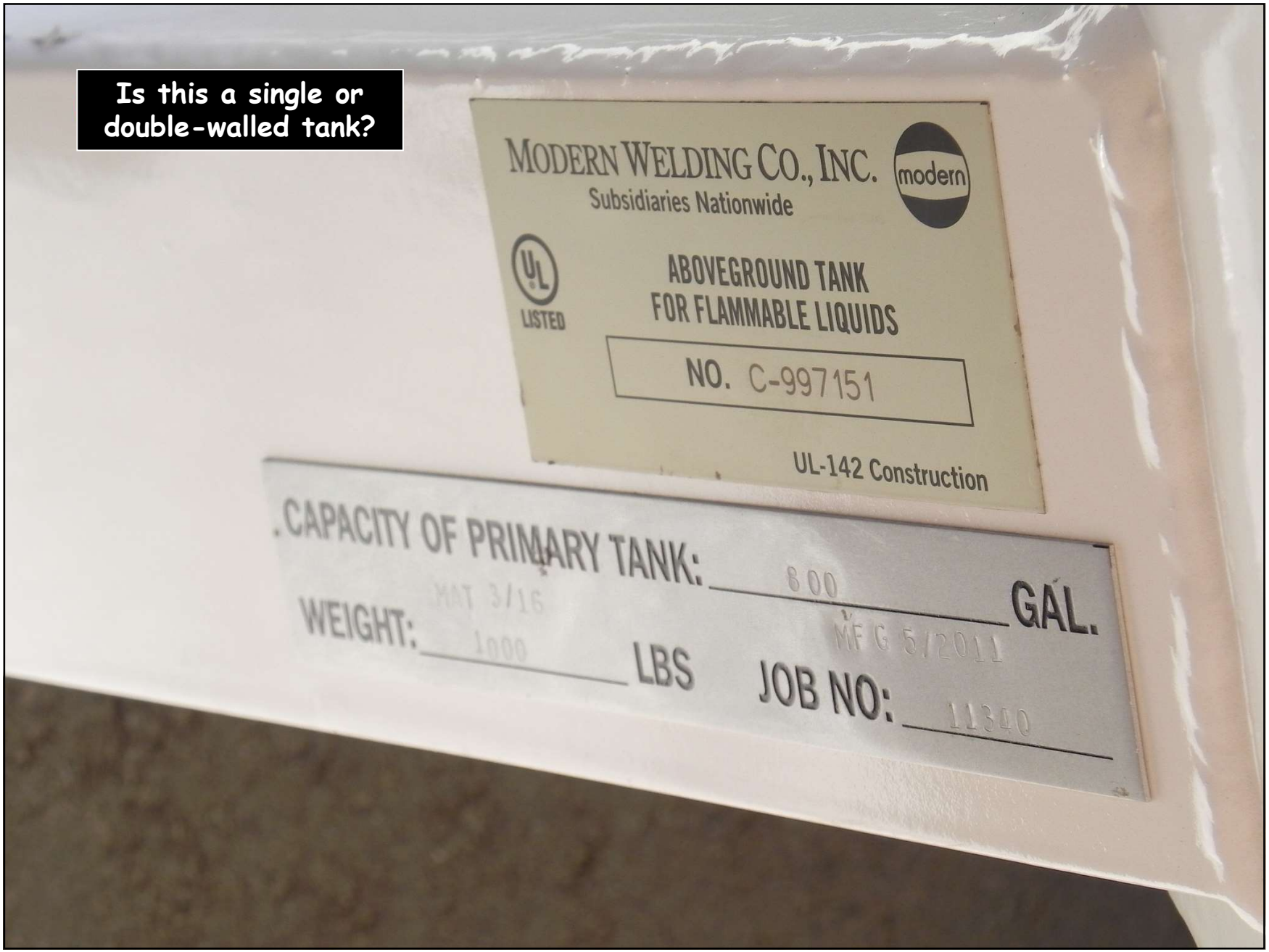
Portable Diesel Generators and Other Portable Diesel-fired Equipment

Type of containment required?



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



- This facility's SPCC Plan (PE certified) stated that this single wall stilted tank was located in sized secondary containment
  - But no calculations, drawings/diagrams, or other technical support in the Plan
  - How could the containment adequacy be verified?

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)

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How much containment is required?
Any issues?

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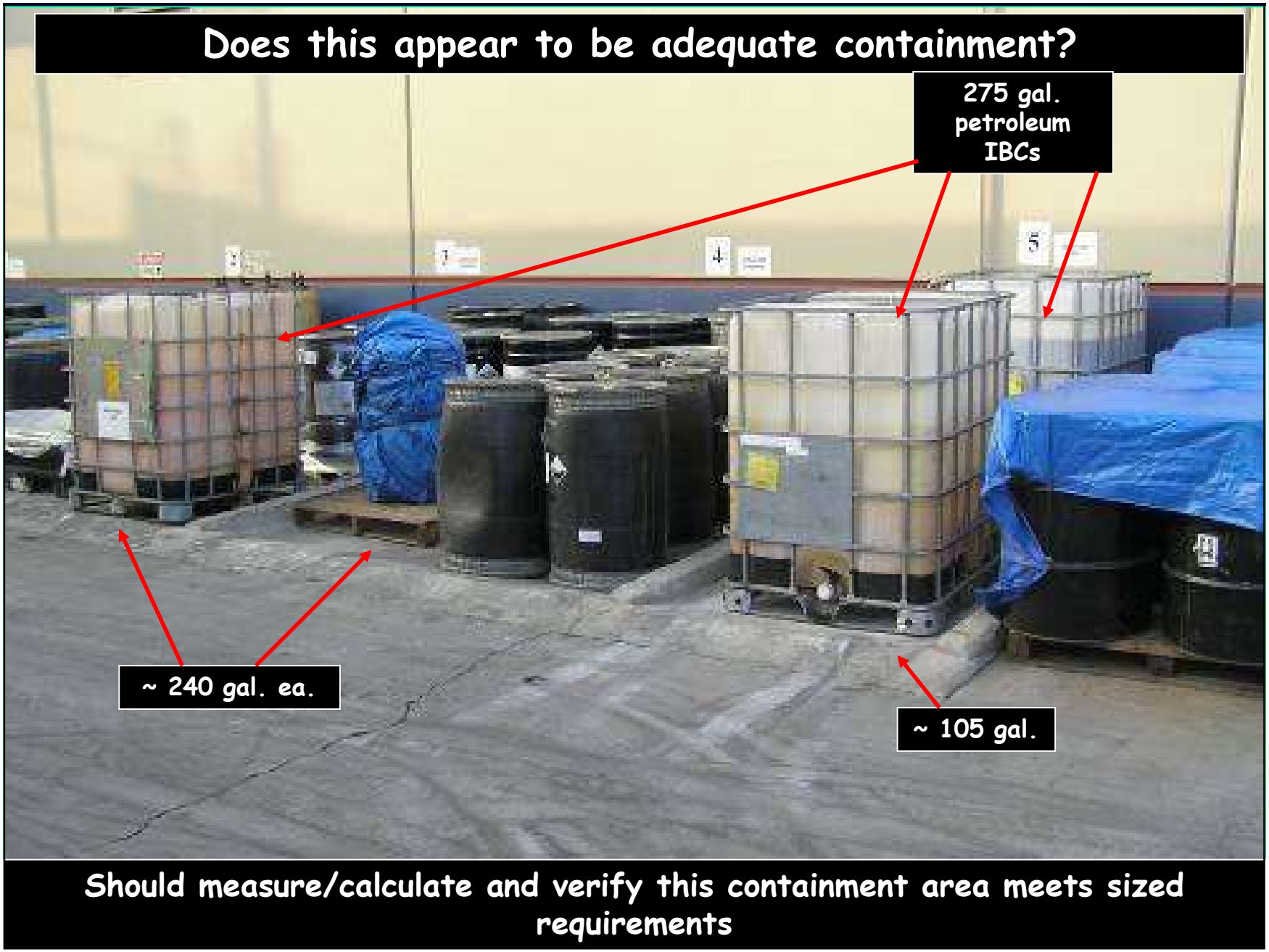
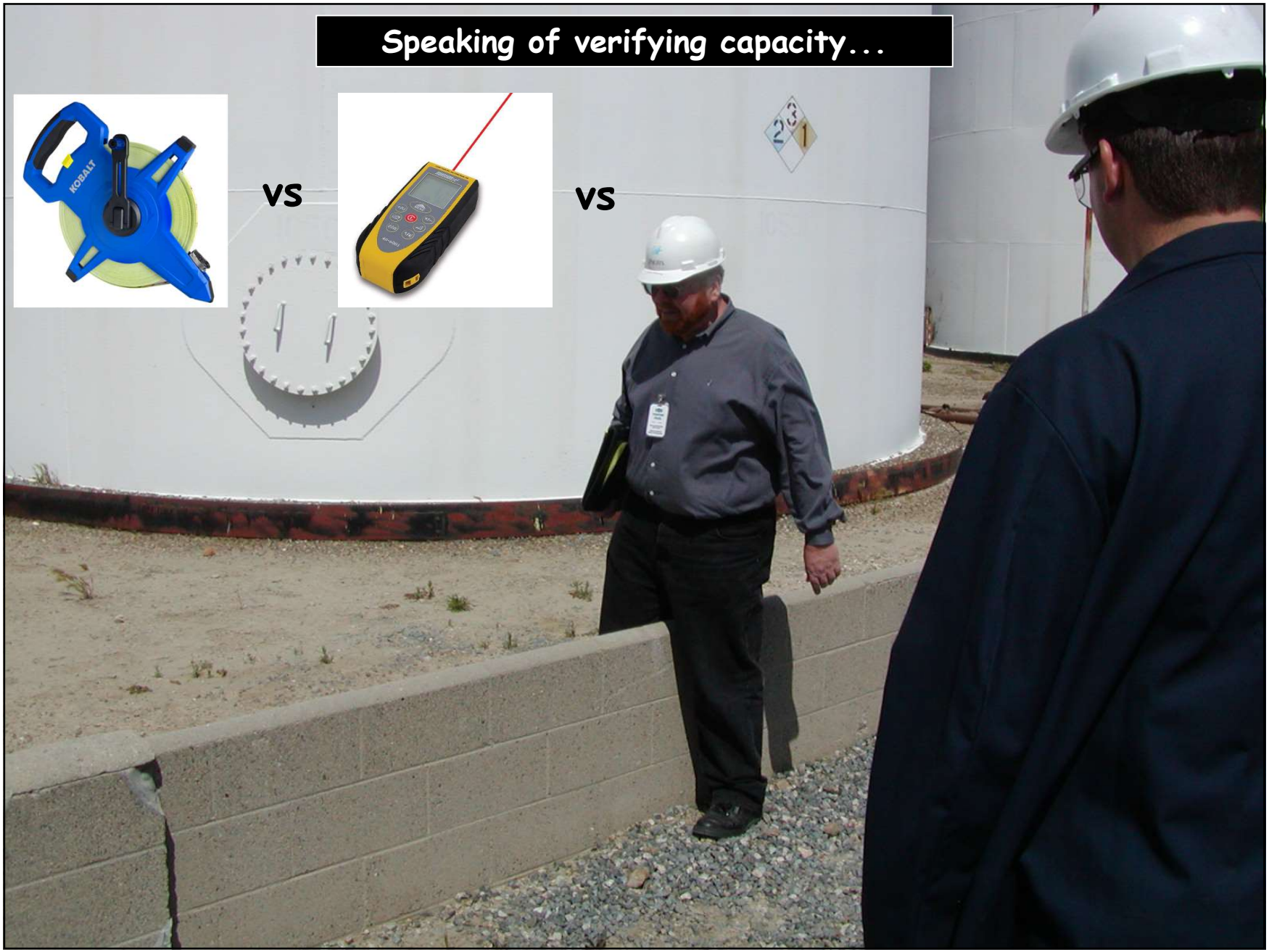




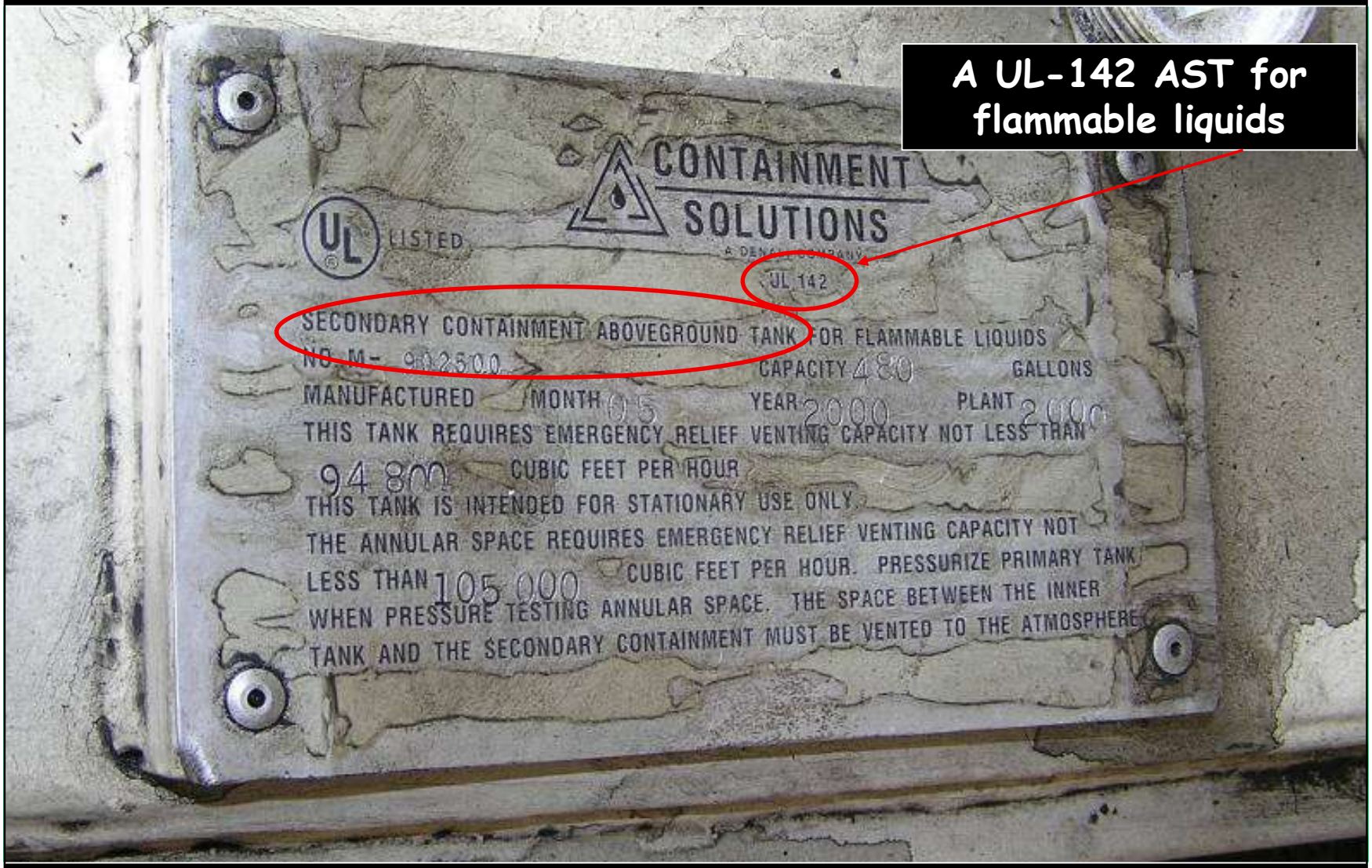
Double-Walled vs Single Walled Tanks

- 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

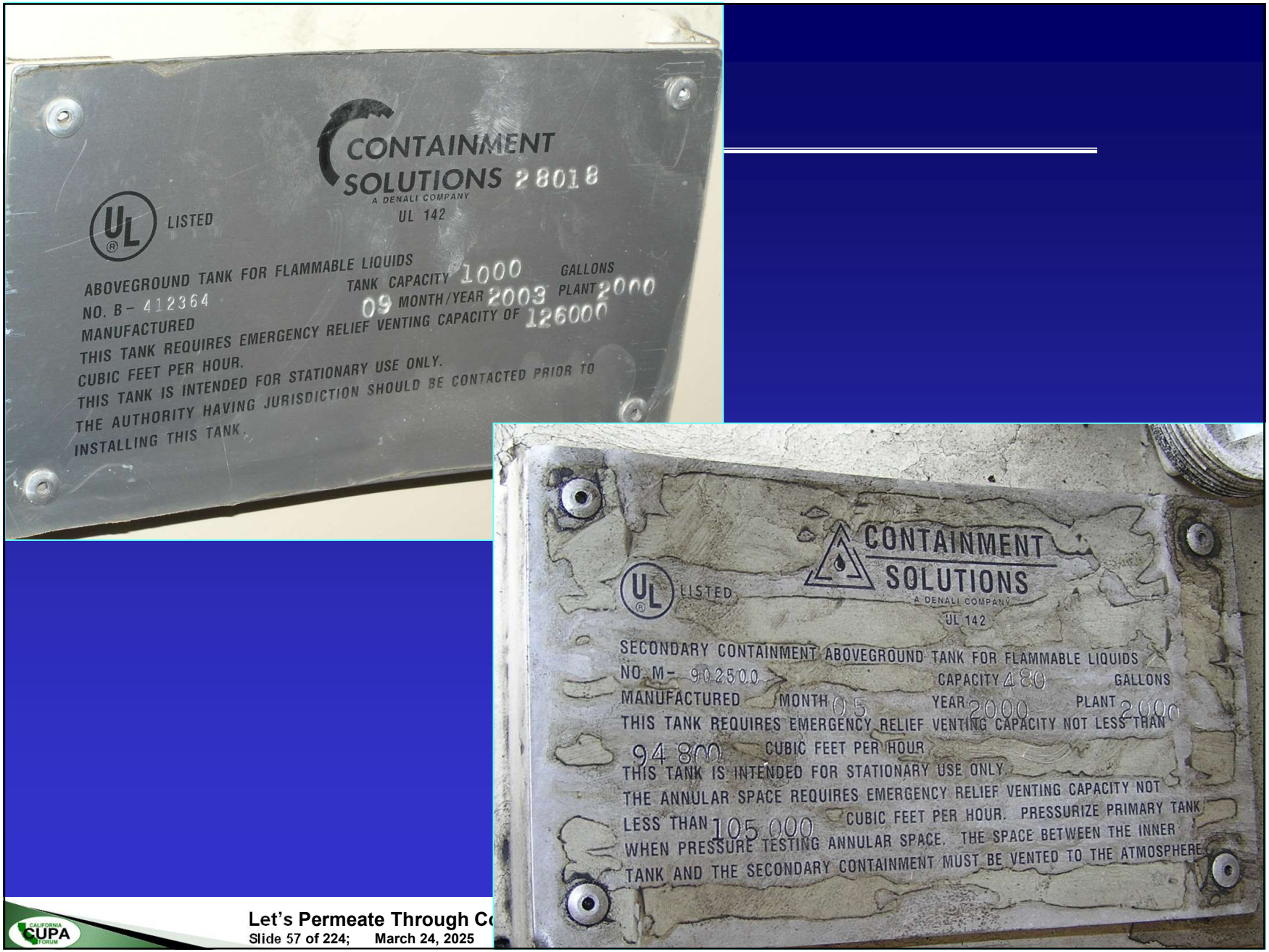
Some tanks are obviously double walled or have integral secondary containment.

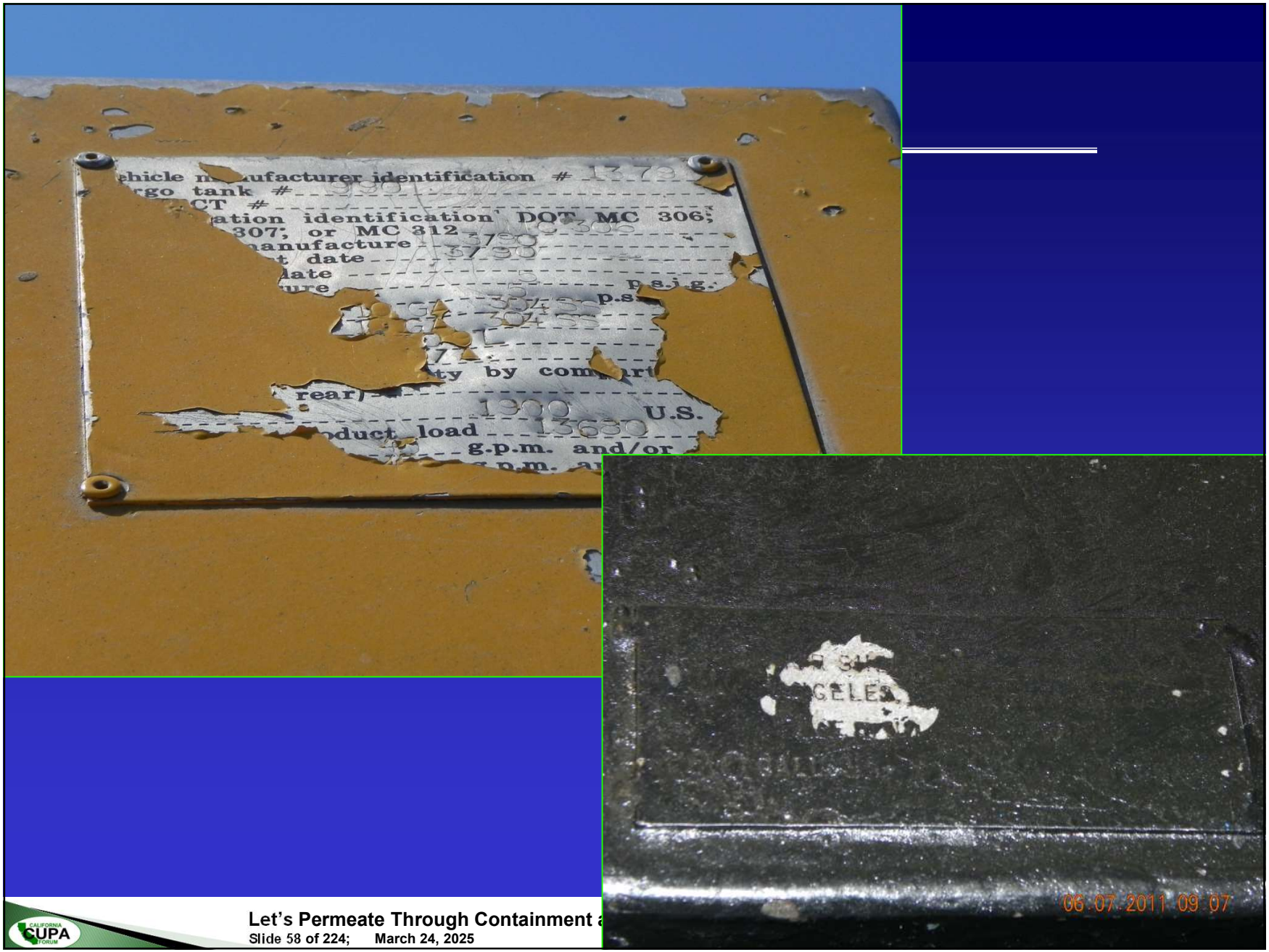
Double walled & integrally contained tanks do not need to account for precipitation freeboard, and inherently meet sized containment standard (if maintained properly).

Double walled tanks? How do you know?



Many times, the manufacturers plate is painted over, obscured, facing against a wall, otherwise unreadable or missing altogether.





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!

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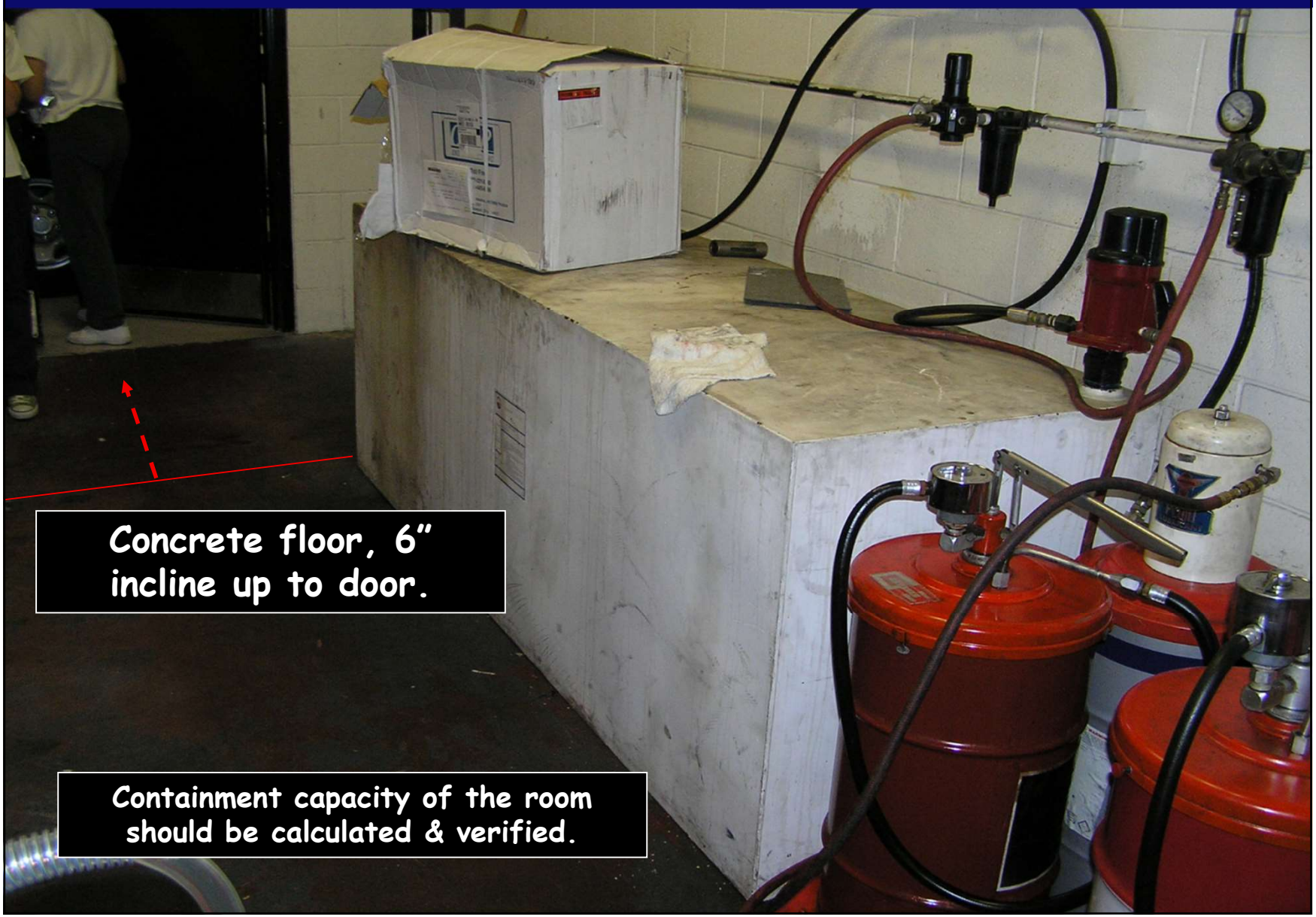
Single walled 480-gallon lube oil tank inside a room with no drain



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.

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

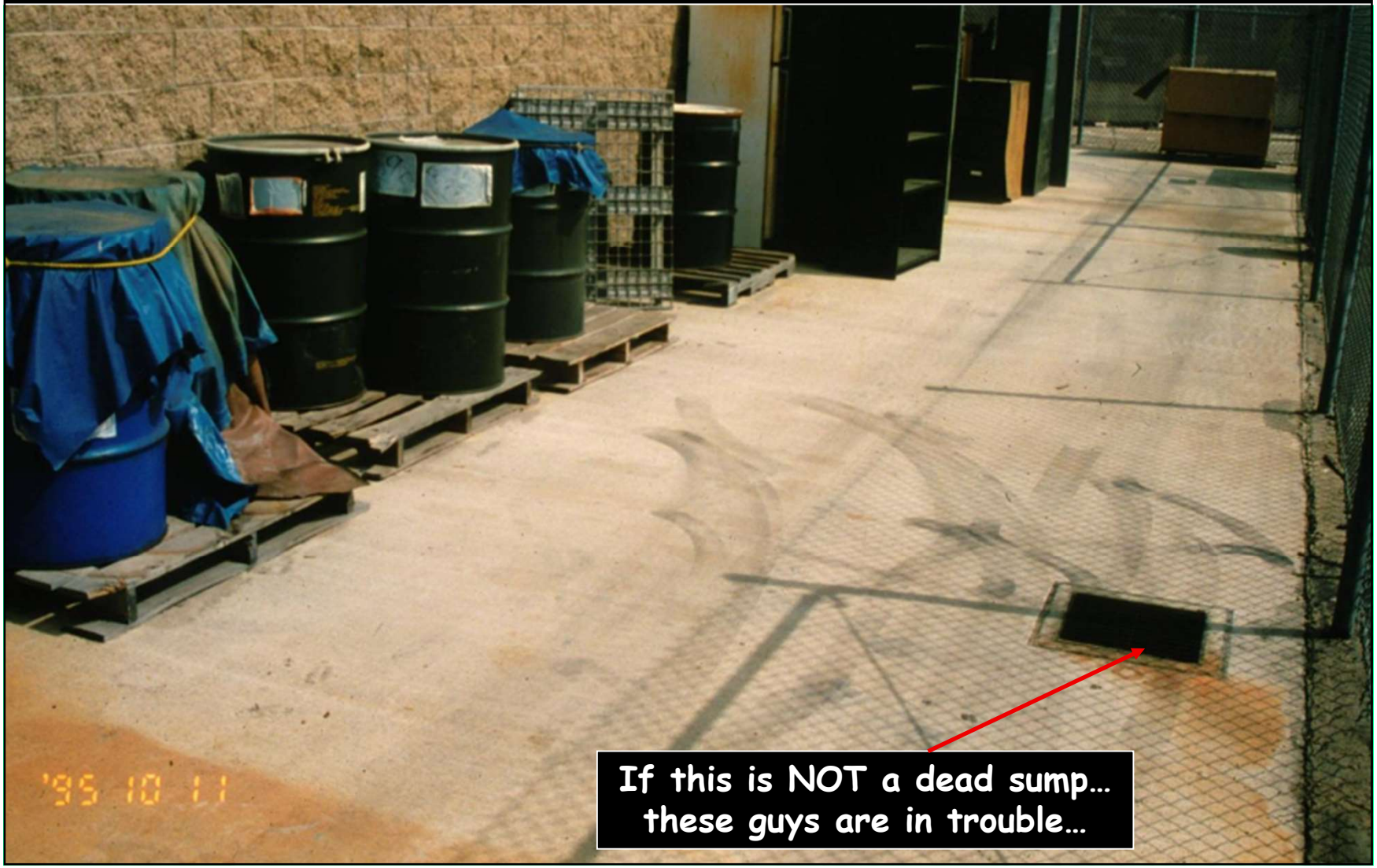
- Already discussed secondary containment…
  - But be aware of the 'discharge prevention positioning' requirement for portable containers and tanks

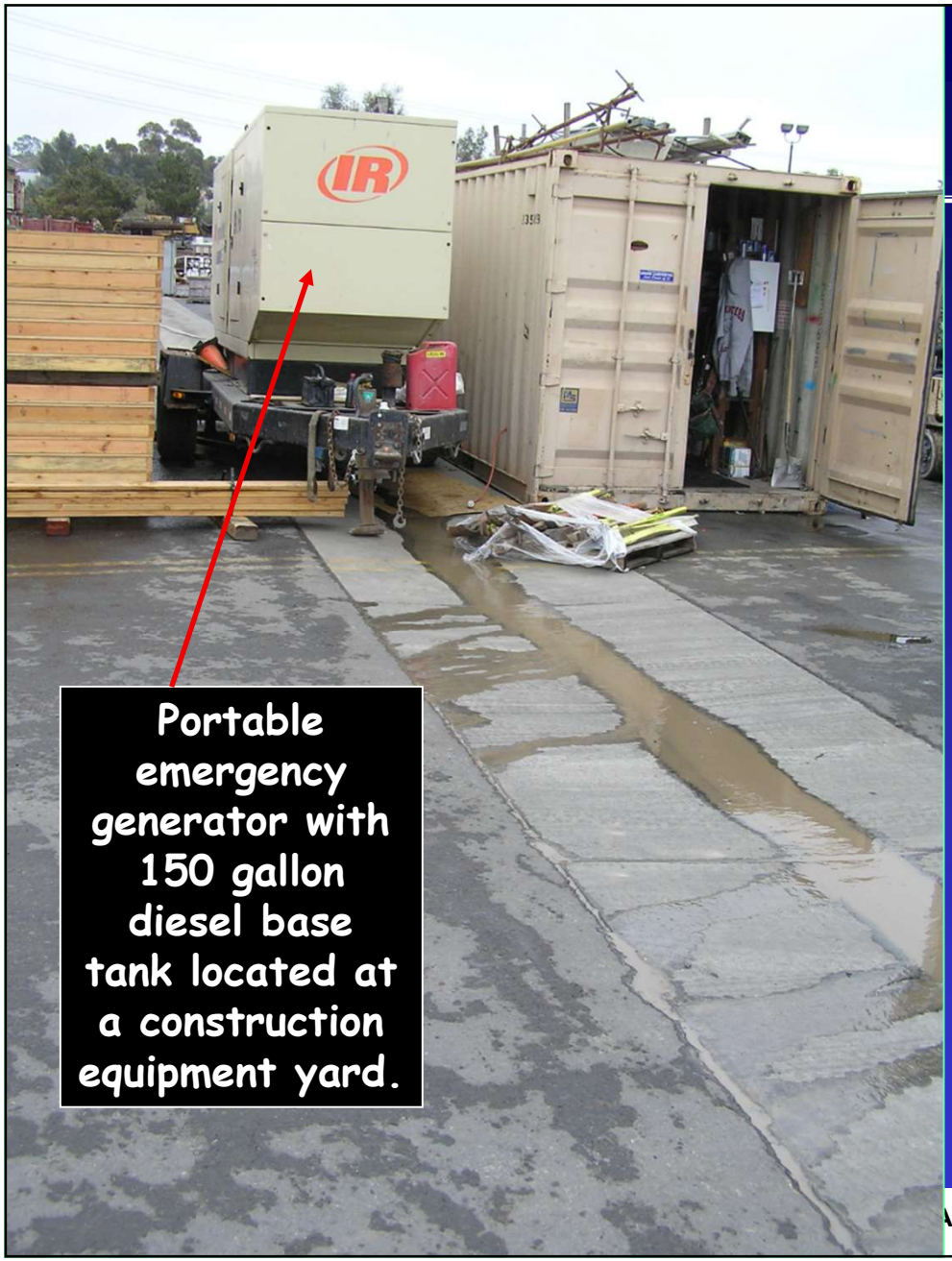
pressure and temperature. *[§§112.8(c)(1) and 112.12(c)(1)]*		
Secondary containment for the bulk storage containers (including mobile/portable oil storage containers) holds the capacity of the largest container plus additional capacity to contain precipitation. Mobile or portable oil storage containers 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

In addition to containment requirements… portable containers must be positioned to prevent a discharge to navigable waters

(i.e. keep them away from the storm drains, gutters and swales!)





Portable emergency generator with 150 gallon diesel base tank located at a construction equipment yard.

US EPA considers any oil in a storm drainage swale to be capable of 'instantaneously' reaching the storm drain.

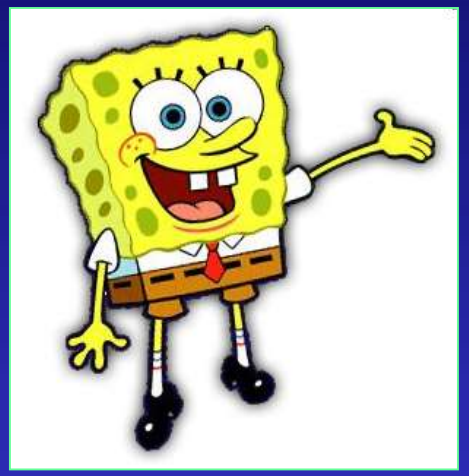
Positioning issue!

Loading Racks

Sized containment... For capacity of largest tank or container that loads/unloads Tanker...Rail car...?

Sufficiently Impervious

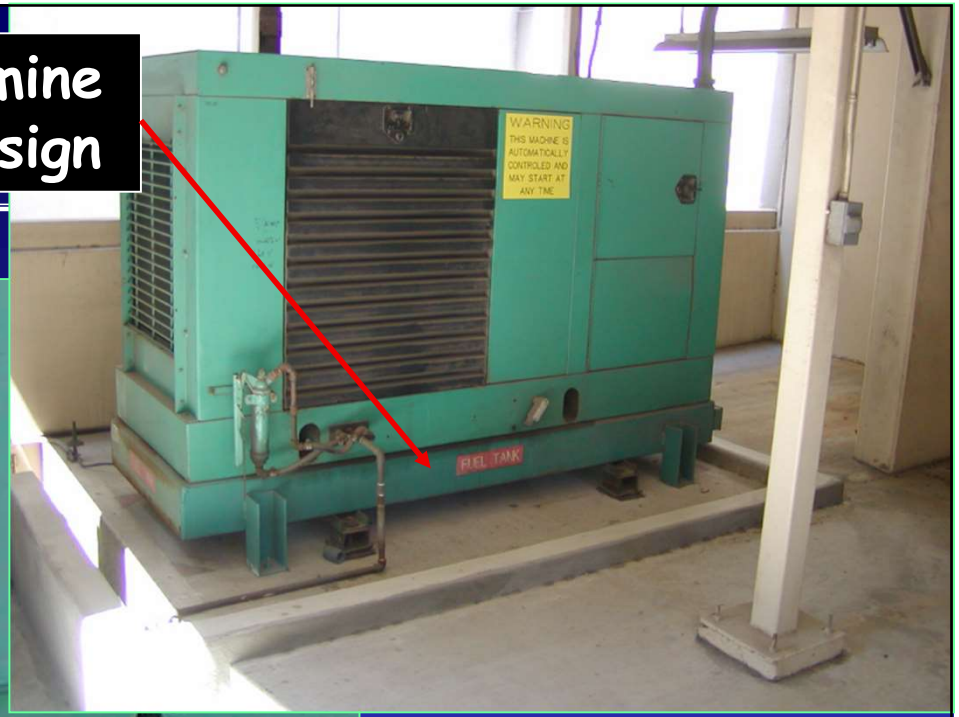
- Secondary containment system "must be capable of containing oil and must be constructed so that any discharge ... will not escape containment system before cleanup occurs" (40 CFR 112.7(c))
- Diked areas must be "sufficiently impervious to contain oil" (40 CFR 112.8(c)(2))

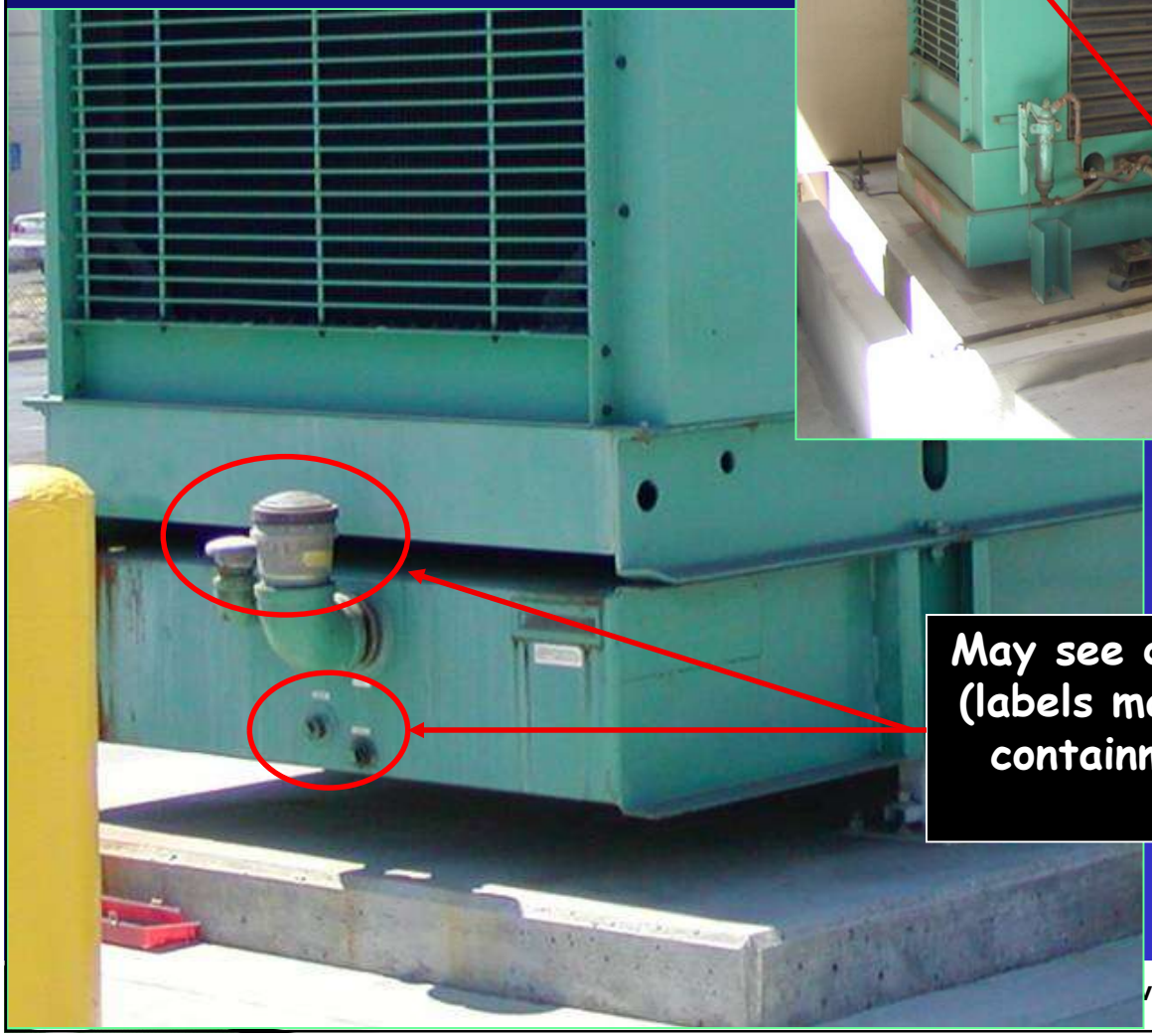


Generator Base Tanks: Single vs Double Walled?

- 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

Impossible to determine tank containment design





May see dual tank drainage plugs (labels may indicate primary and containment drain) or dual e-vents

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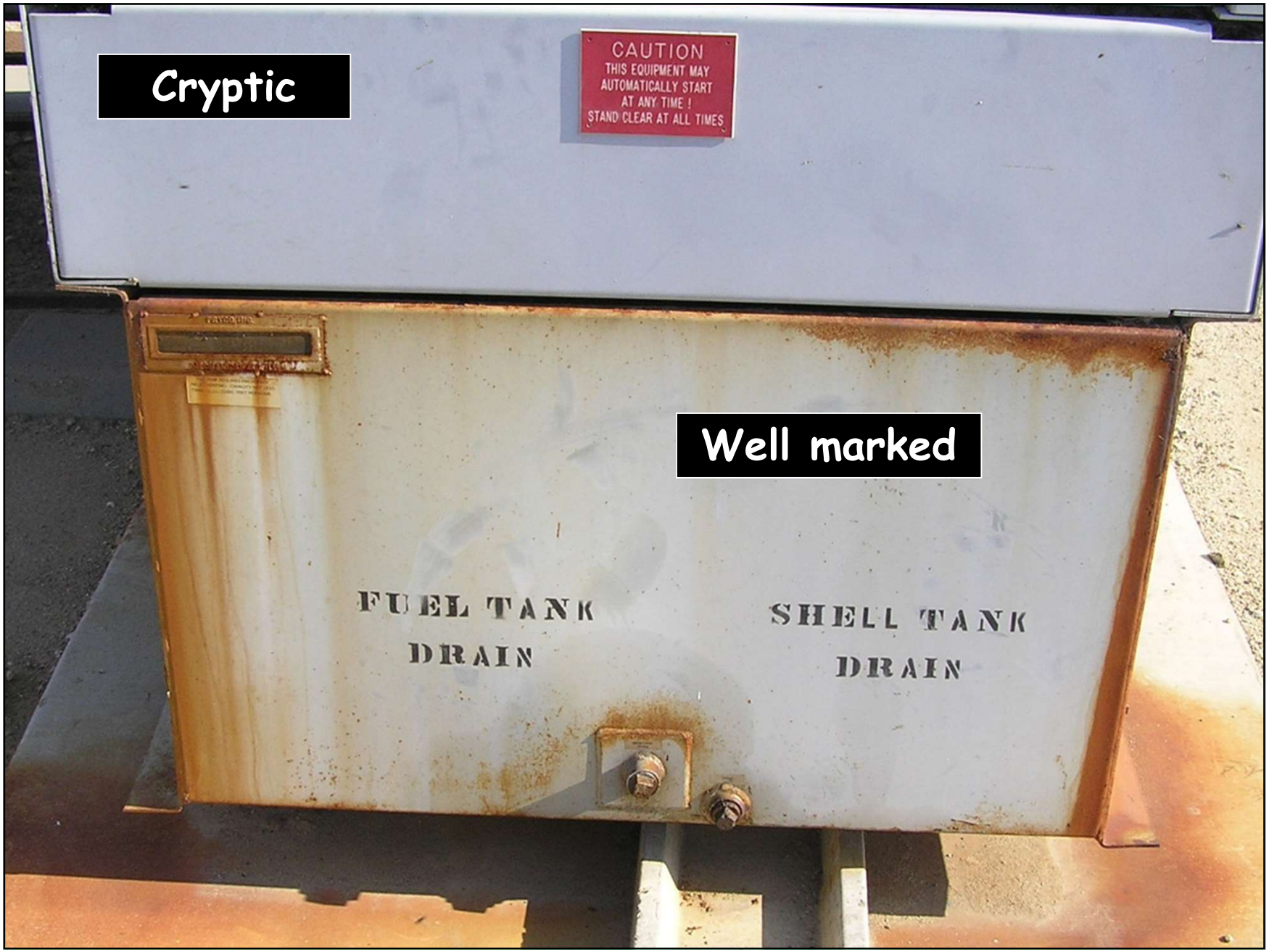

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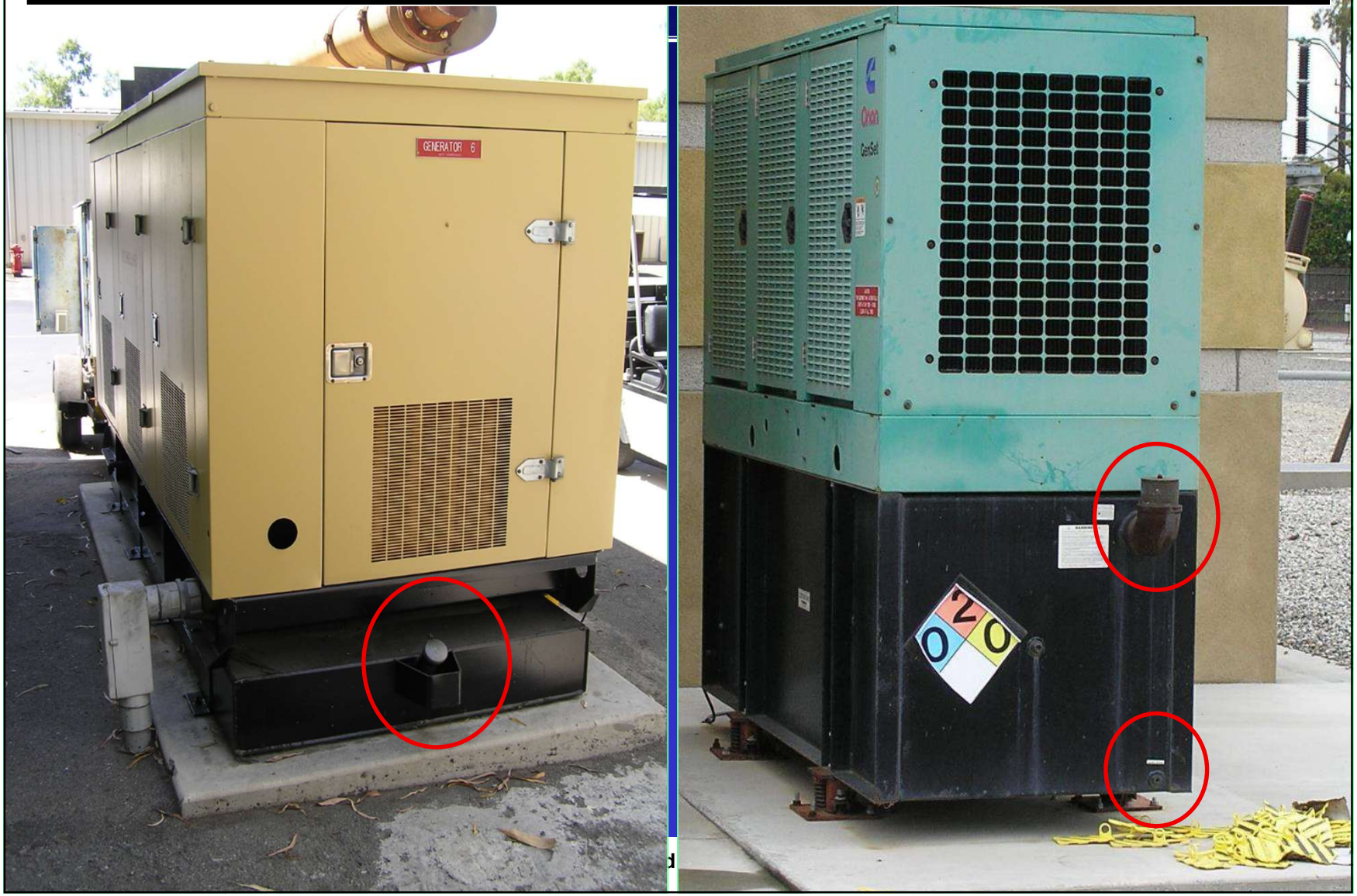
Fill port design & single base tank drain indicate a single walled base tank



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

- 40 CFR 112.7(c) requirements for general oil handling areas & equipment are <u>not</u> 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

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

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

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**

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

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]					
Pipin					
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

POP QUIZ: OFE or Bulk Container?

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

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?

Small curbed area and 'dead' sump in front of double walled tank has ~200-gallon capacity *(if the rainwater is pumped out)*. This is passive general containment for fuel loading and unloading activities.

Examples of General Petroleum-Handling Areas/Equipment

- The oil-filled grinding/machining equipment (>55 gal.) in the grinding shop
- The grinding shop areas where the oil drums are moved and handled
- The fuel loading area in front of the two fuel tanks
- The area from where the two lube oil tanks are filled
- The areas where 55 gal. drums of oil are loaded or unloaded
- The hydraulic presses
- The areas where oil and waste drums are moved or handled
- Oil-filled piping connected to any of the tanks

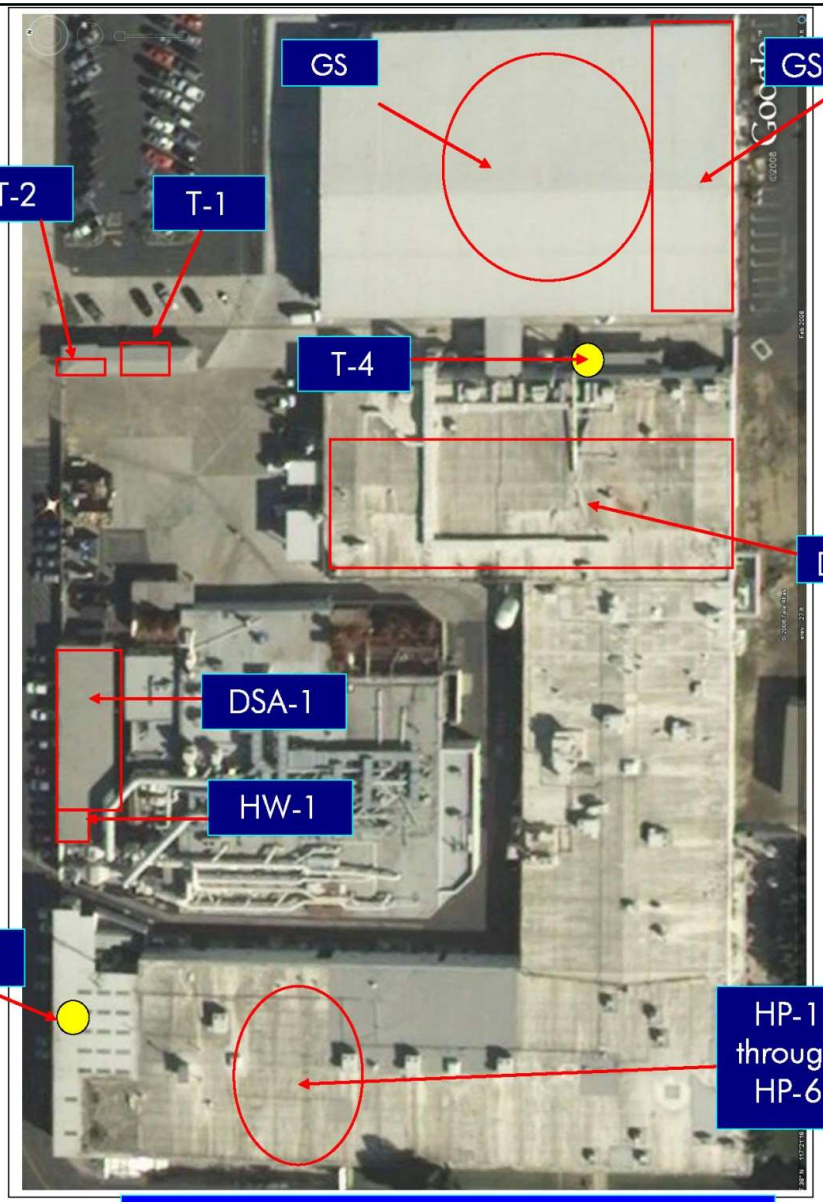
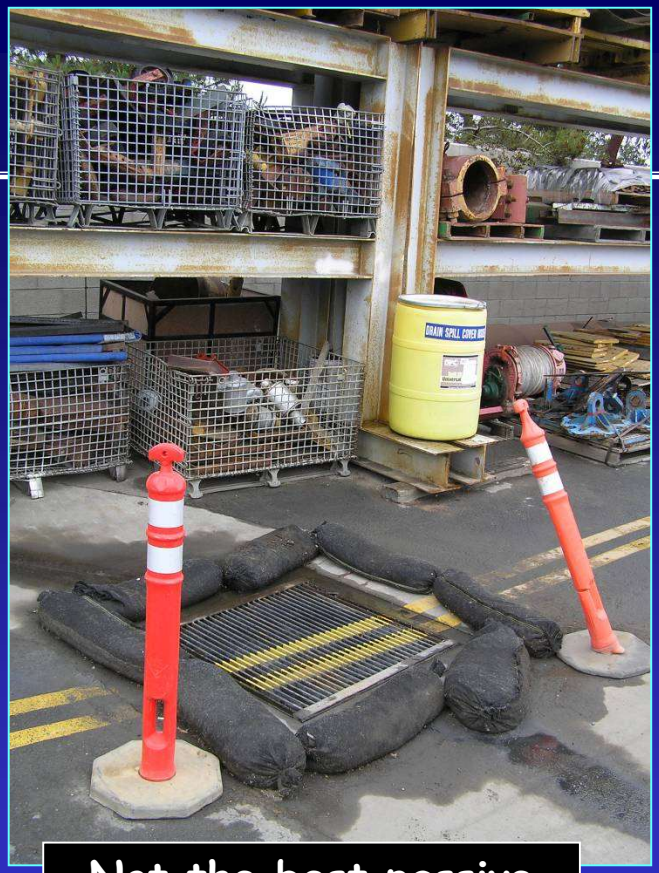


Figure 1 – SPCC Regulated Containers, Tanks, Equipment at Sample Class facility (see Table G-2)

Active Measure Examples

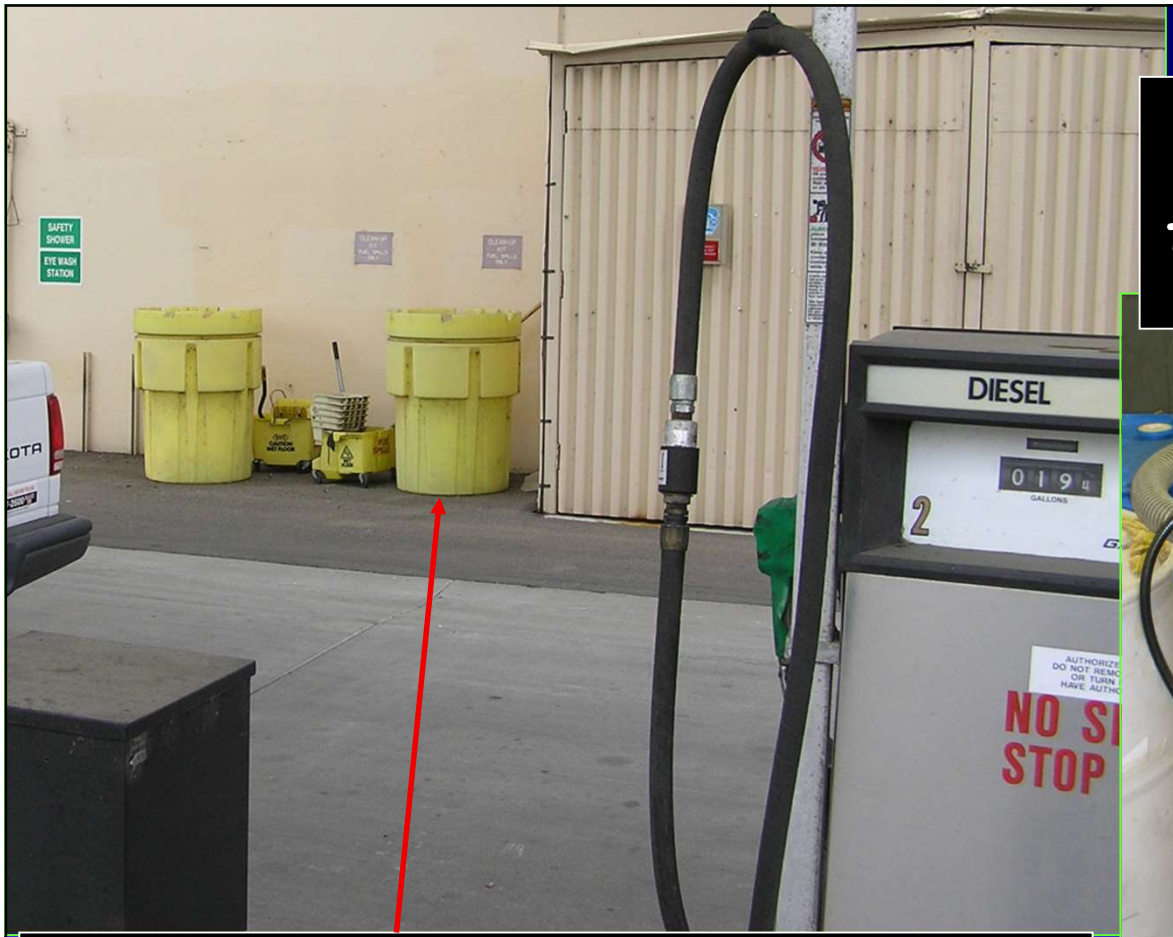
- Use of storm drain covers
  - ✦ Should be properly designed and well maintained
  - ☠ Covering the storm drain in an area where a transfer occurs ***prior*** to the petroleum transfer activity
  - ☠ Covering the storm drain in ***response*** to a discharge, before the oil reaches the drain
- Using spill kits in the event of an oil discharge
- Closing a gate valve that controls drainage from an area
  - ☠ Prior to a discharge
  - ☠ In response to a discharge



Not the best passive measure

Can be either active, passive or both (depending on how the facility implements)

Facility employs a lot of Ukrainian personnel



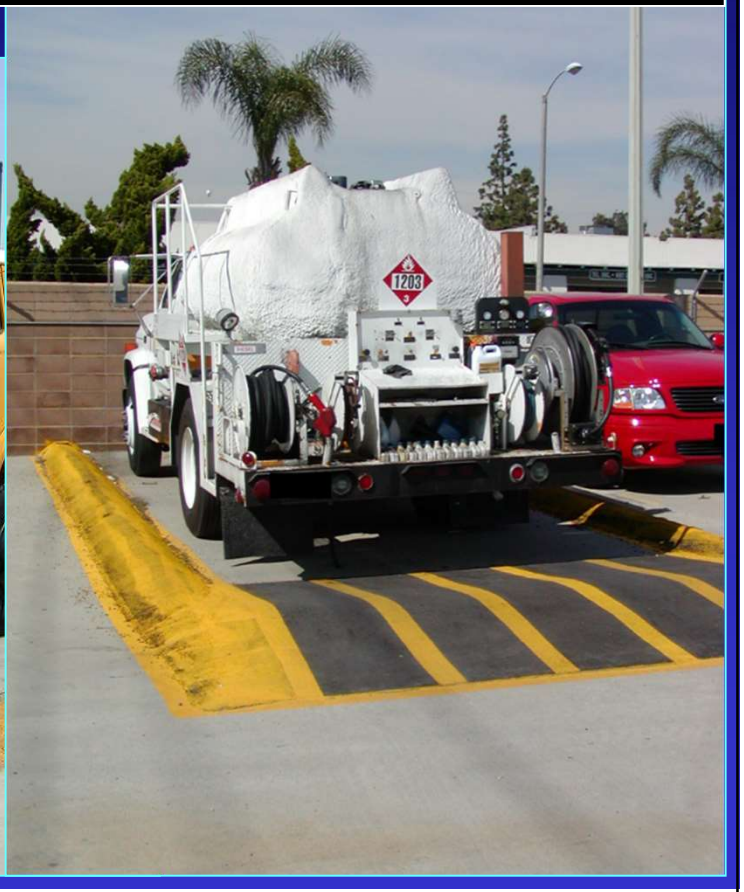
Spill supplies staged at the fuel dispensing area (could be better marked, though)

Air operated oil vacuum used (in part) for oil spill clean up in a large machine shop

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

Let's Permeate Through Containment and Failure Analysis – Rev 1
Slide 108 of 224; March 24, 2025

BUT!! APSA regs (19 CCR 1607(c)) specifies that a "rail car, tank car, or tank vehicle shall not be used as a storage tank in a permanent or fixed installation at a tank facility". Fire code (Chap. 5704.2.2) "Tank cars and tank vehicles shall not be used as storage tanks".

Mobile/portable containers that generally operate in fixed locations at a facility, and tanker trucks used to supplement storage and serving as a fixed tank are *bulk storage containers*. Sized containment required

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General Containment Performance Example

The SPCC Plan for this facility states they use active measures (spill response and sorbents) to keep petroleum discharges from reaching navigable waters

Use of response and sorbents to prevent nav. water discharges may turn out not to be appropriate for the loading area up gradient from the storm drain (and should trigger a Plan amendment after this discharge)

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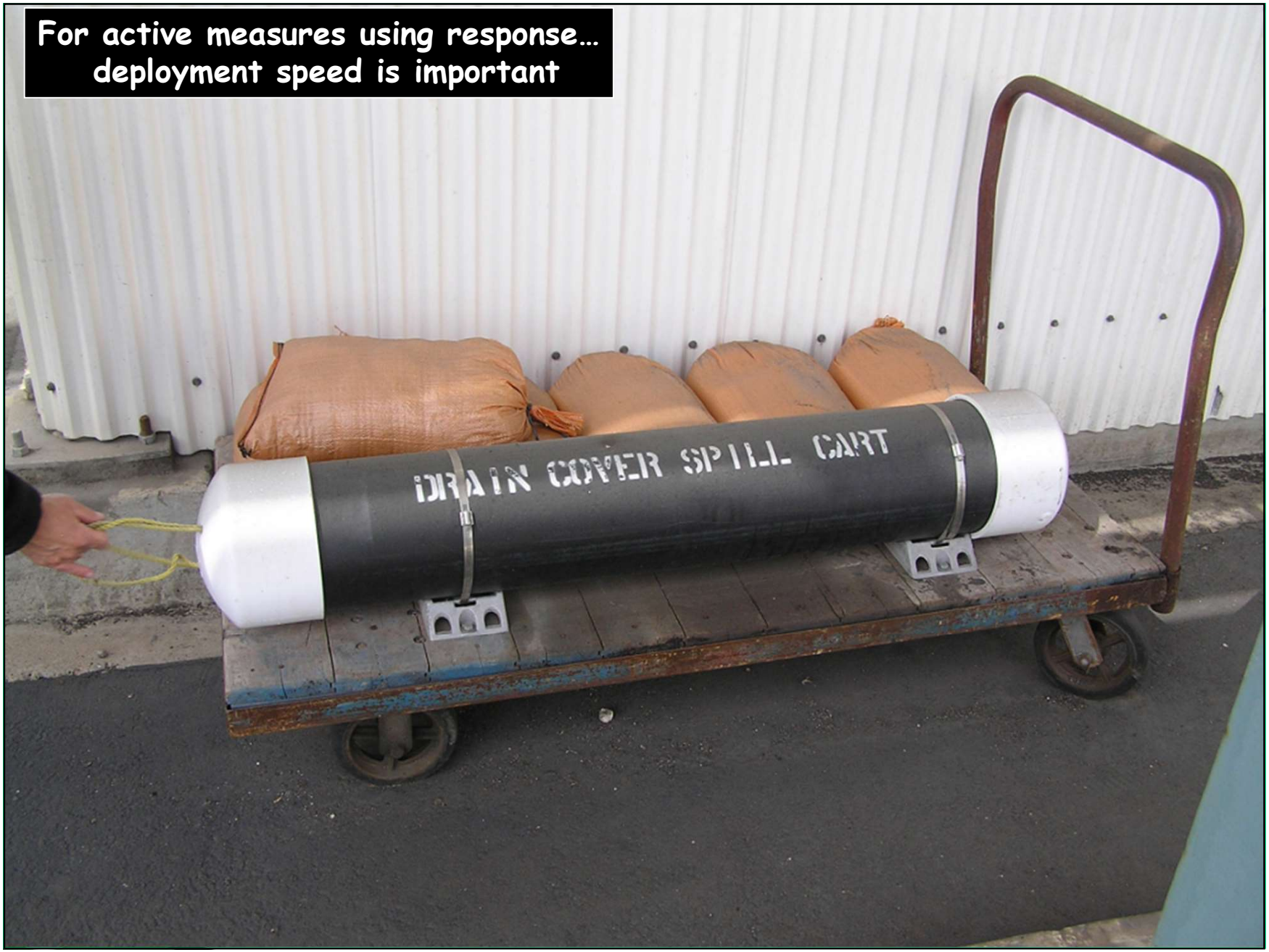
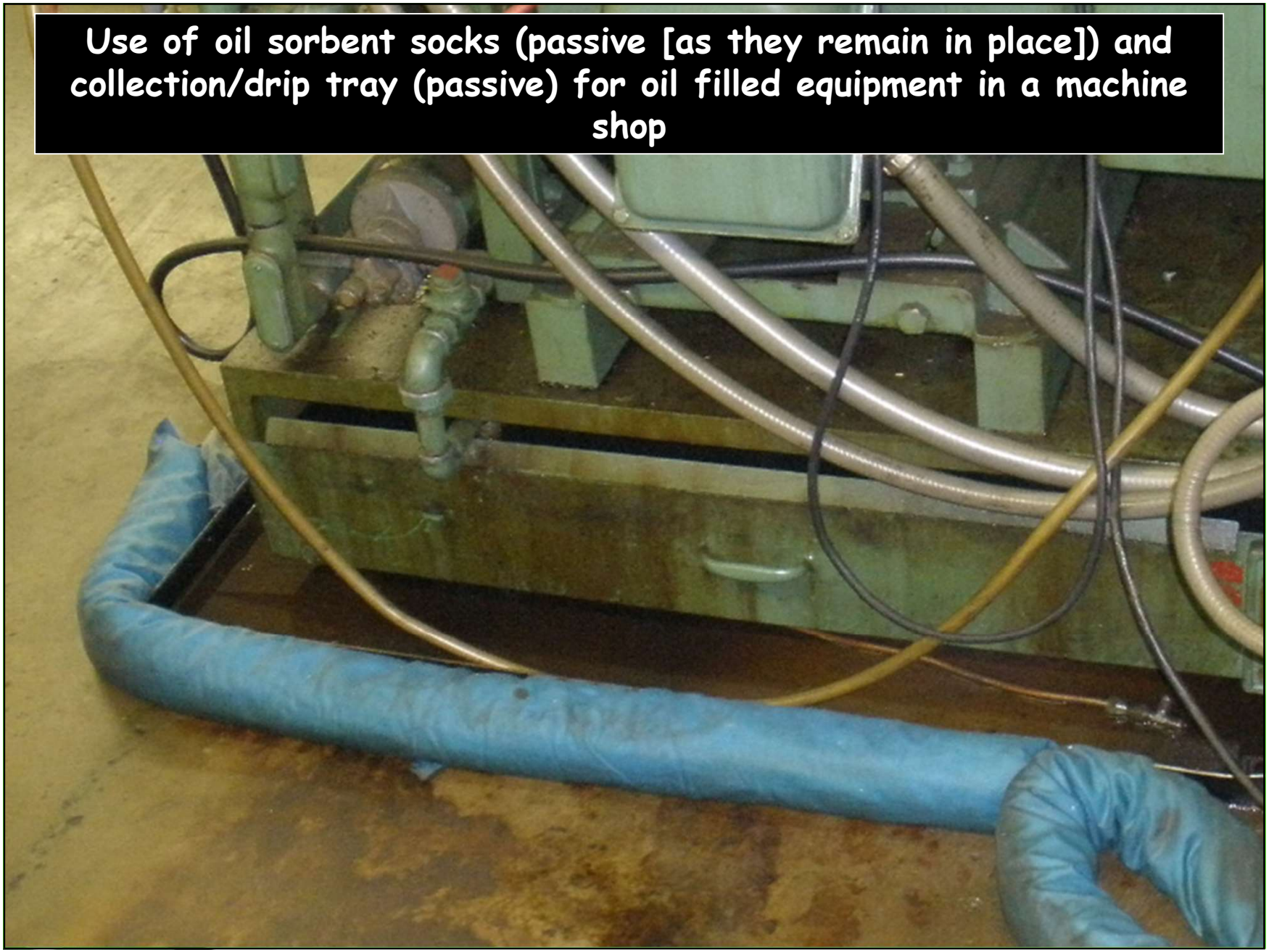
The SPCC Plan for this facility states they use active measures (spill response and storm drain covers) to keep petroleum discharges from reaching navigable waters





Example products for general containment – active measures... But spill kits and absorbents need to be properly sized.

Capacity? Oil only vs all liquids?

– Rev 1

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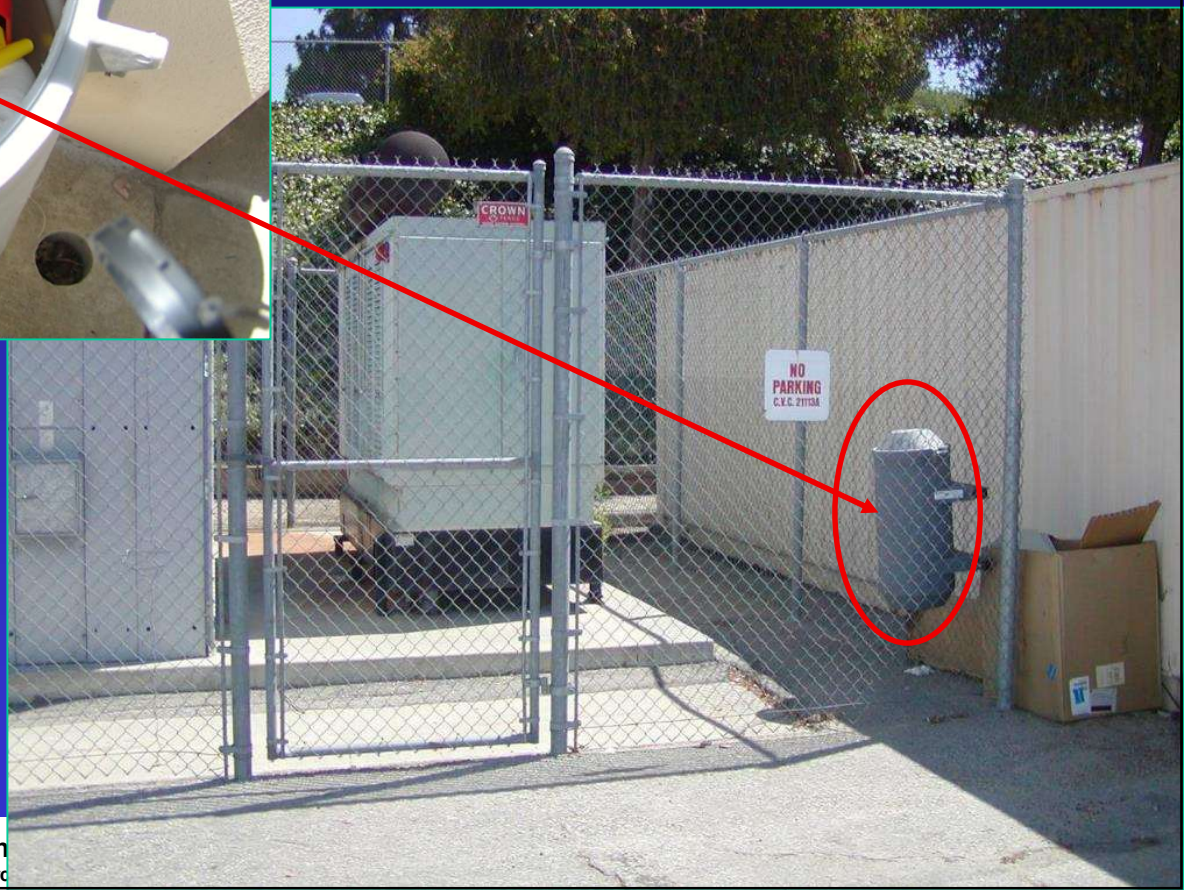
This facility (and the Plan) stated they use spill kits and response during generator tank filling operations



Airport mobile refuelers staged on the ramp

Is using oil-only sorbent booms, each with 10 gal. capacity (to be) layered on the down-slope (and weighted with shot-bags)

Passive...but needs frequent inspection and maintenance

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?

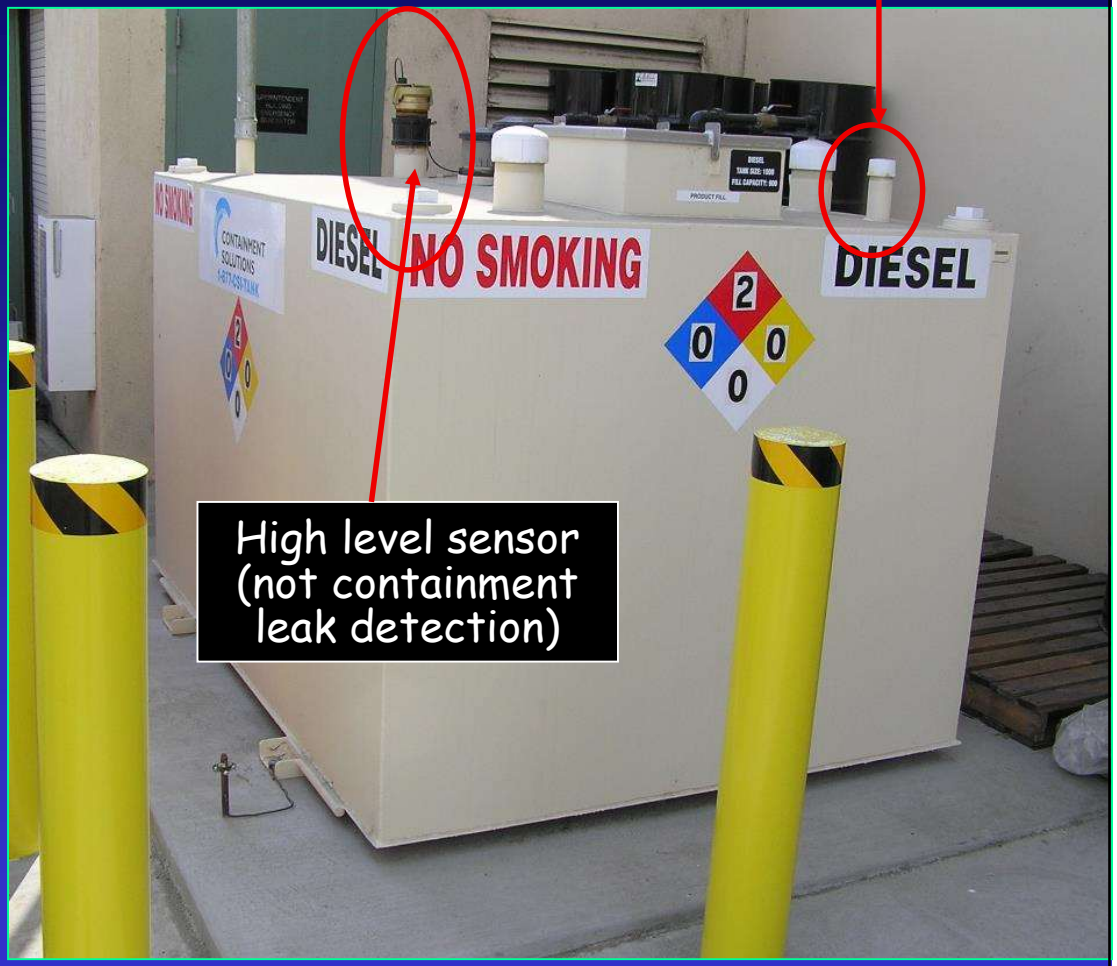
- How would a facility inspect the outside of the tank for leaks?
  - Or inspect the containment for accumulation of oil
- **The outside you see here is the *outside* of the *secondary* containment**
  - Not the outside of the primary tank

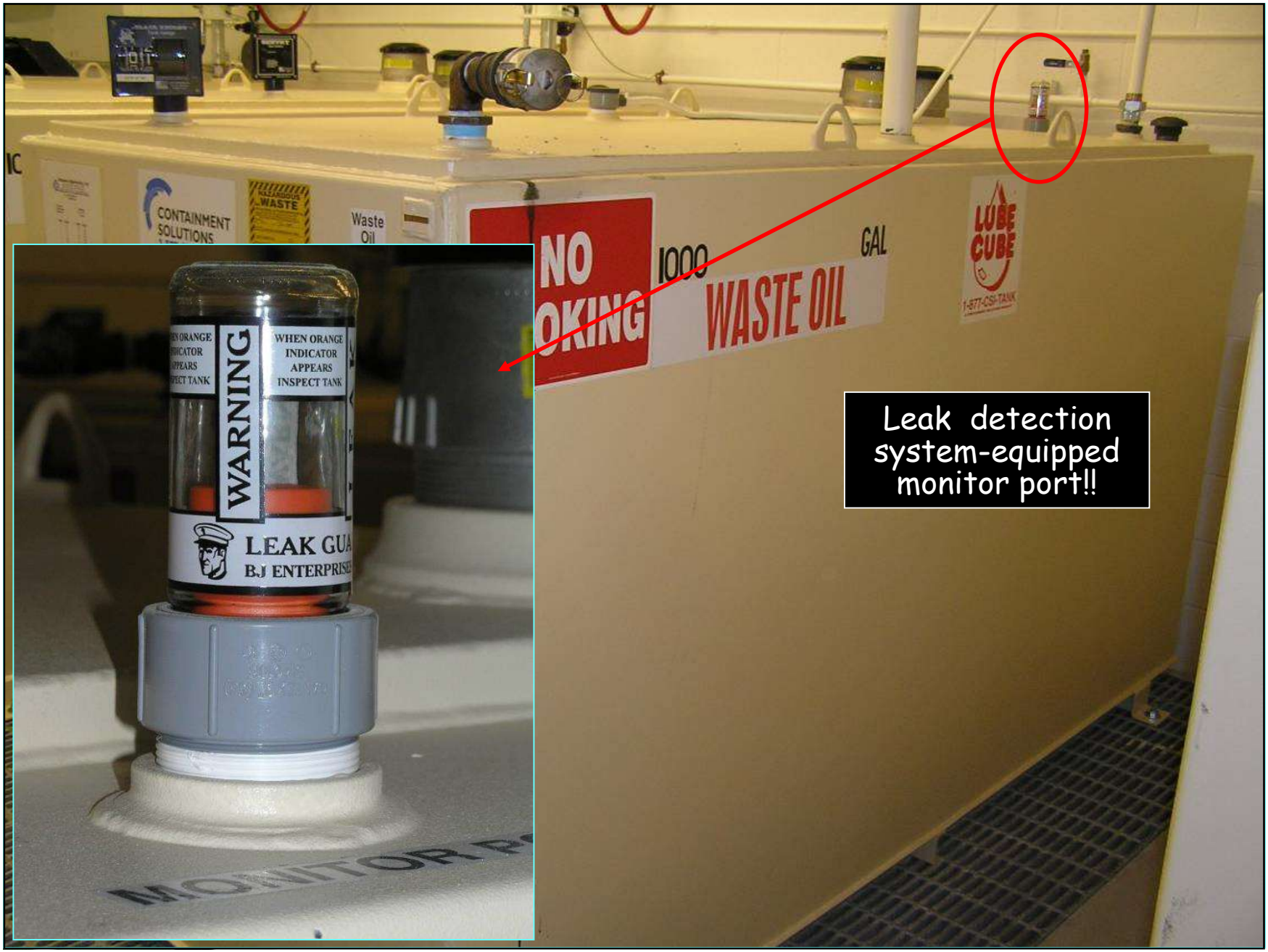
Visual Inspection of Integral Double Walled Tanks for Leaks?

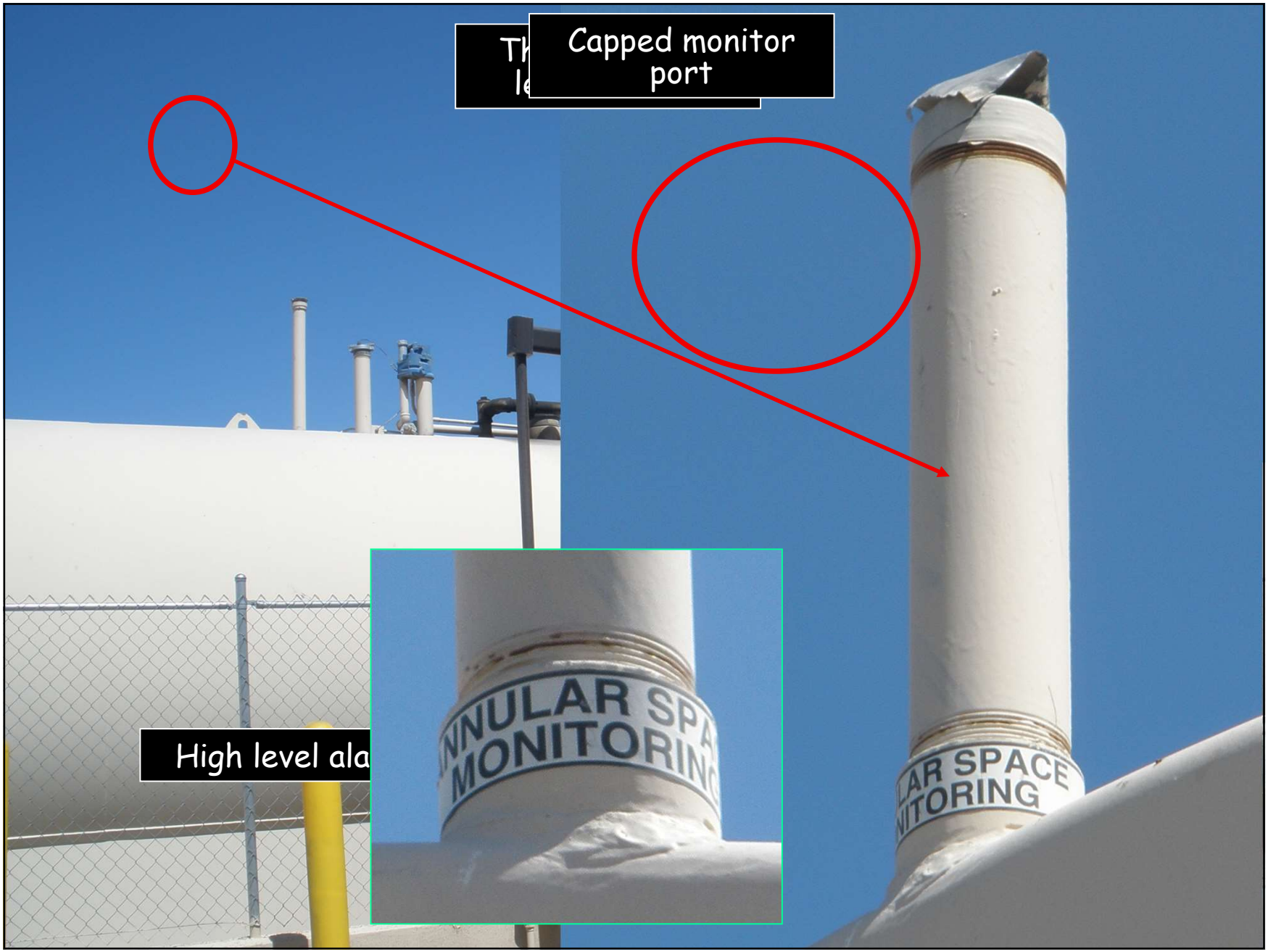
- Most have provisions for the use of interstitial space leak detection or monitoring
  - Some tanks *are* already equipped with leak detectors
    - Manufacturer or supplier optional equipment
    - ✦Mechanical or electronic systems
      - Locally or remotely reported
  - Most tanks are not so equipped
    - ✦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)

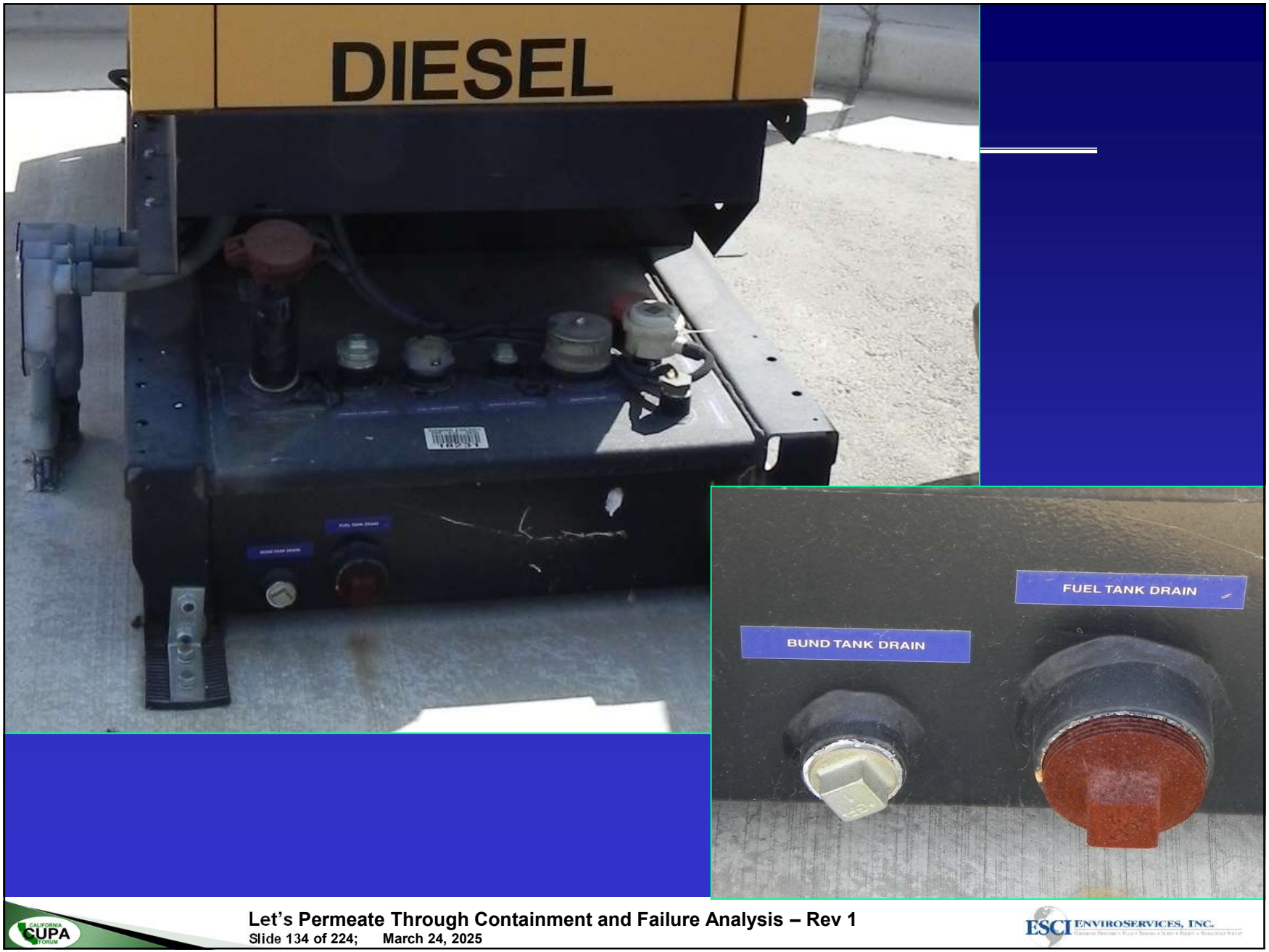
Verification?

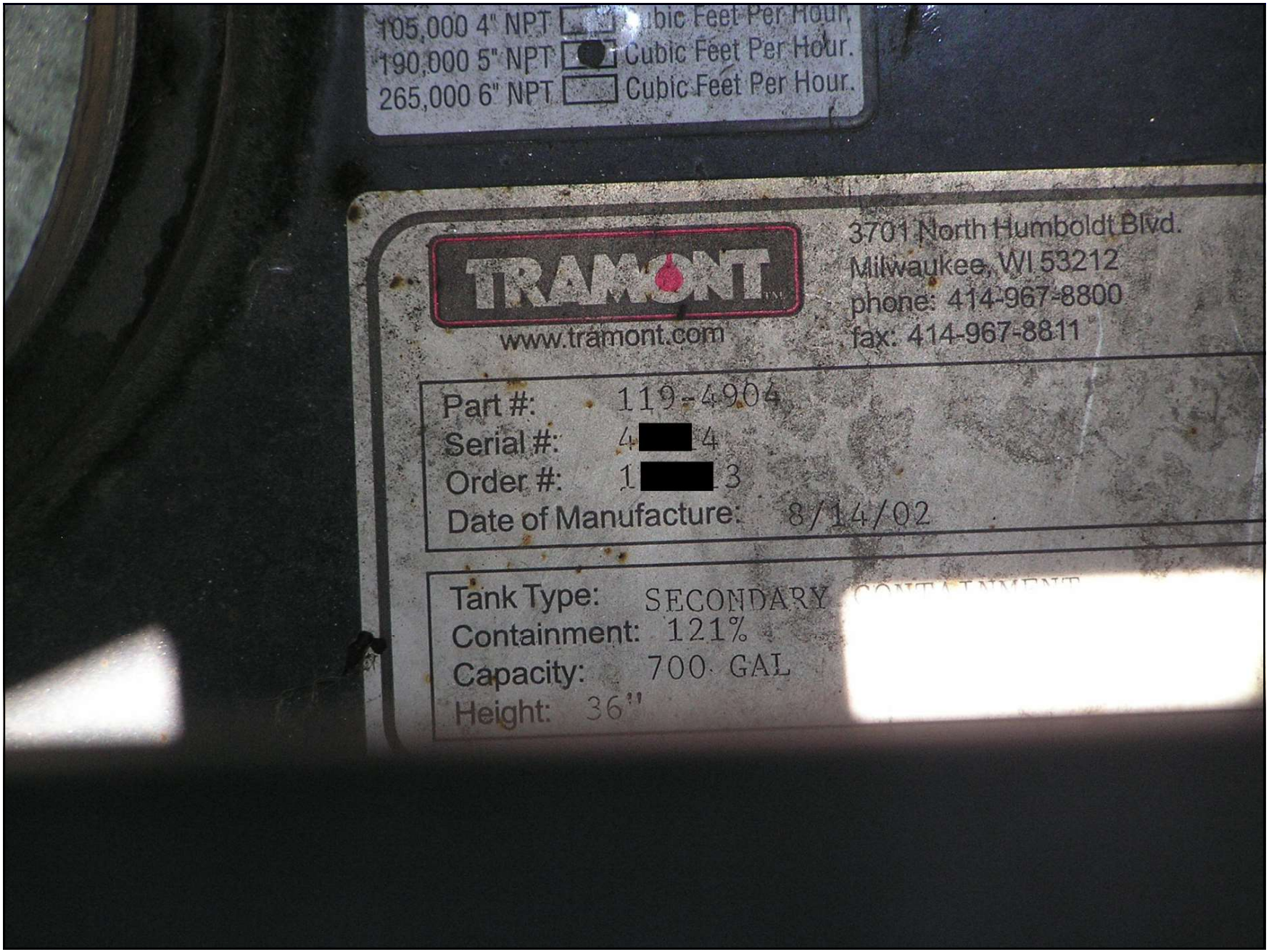
- **In SPCC Plan**
  - Plan should describe if interstitial space is monitored
- **Is it??**
  - Look at tank top for 'monitor port' or other sensor/ detector port
    - ✦Is it just capped… or is there a sensor or monitor?

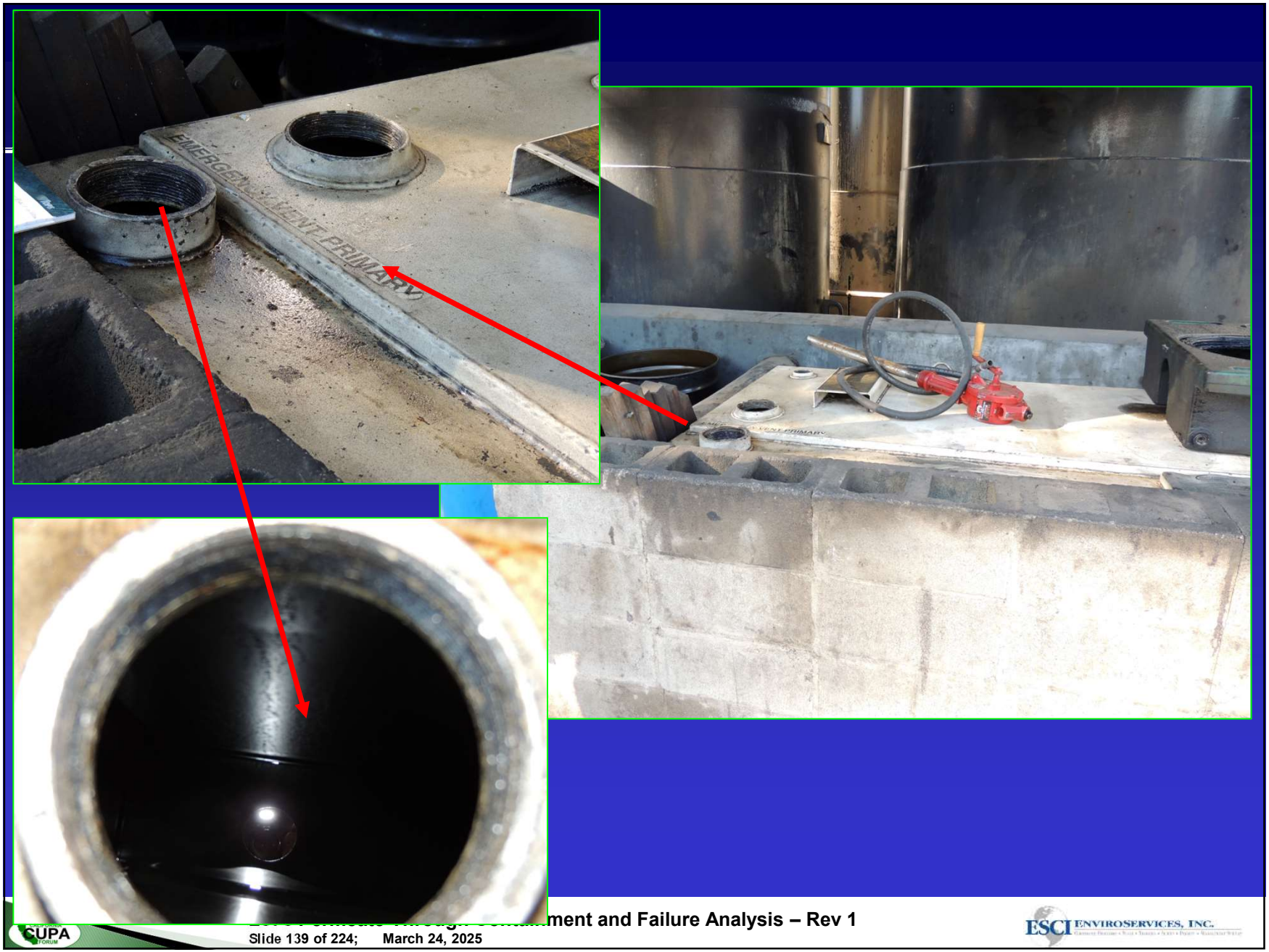


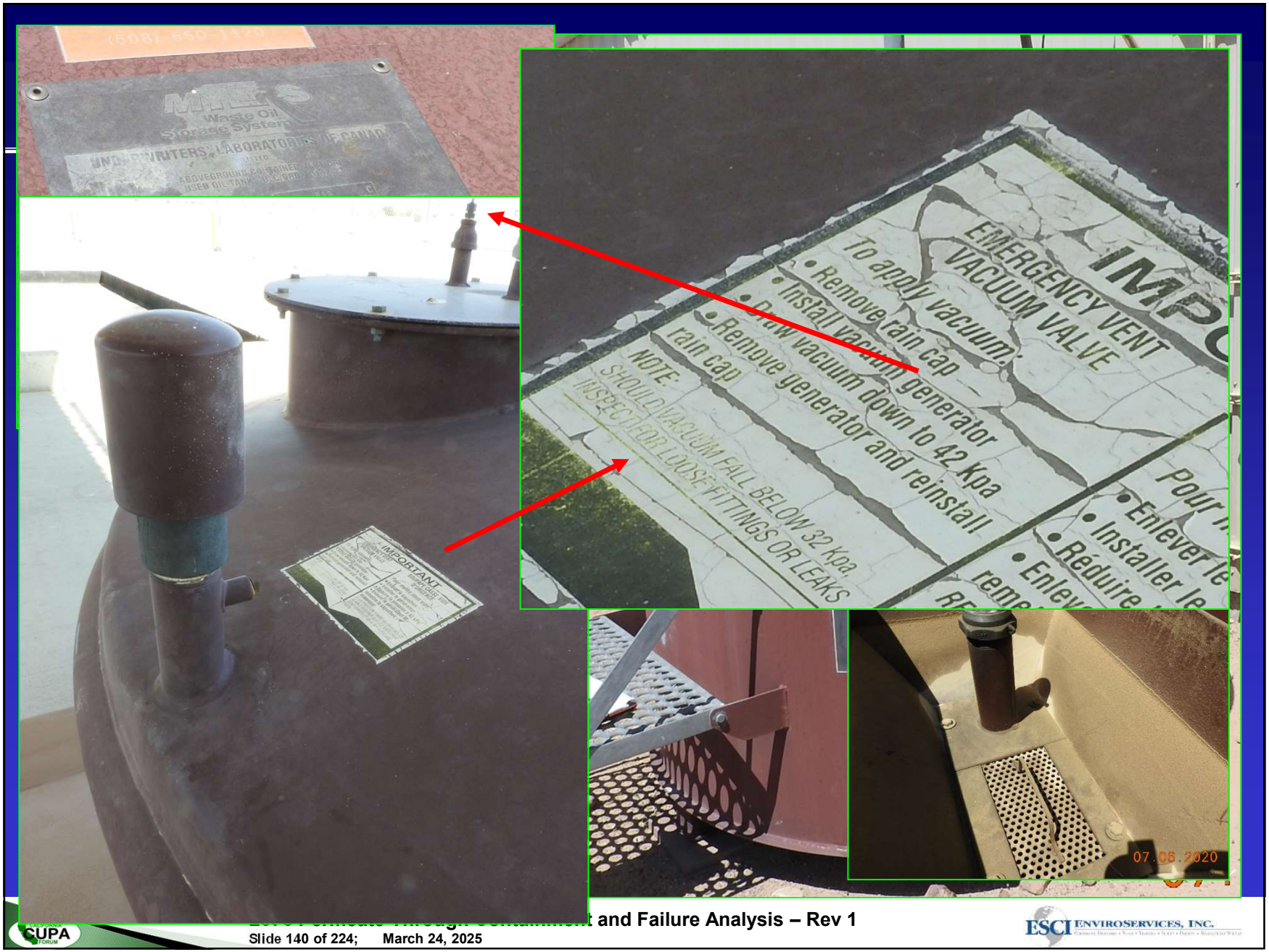












Oil-filled Equipment

- 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

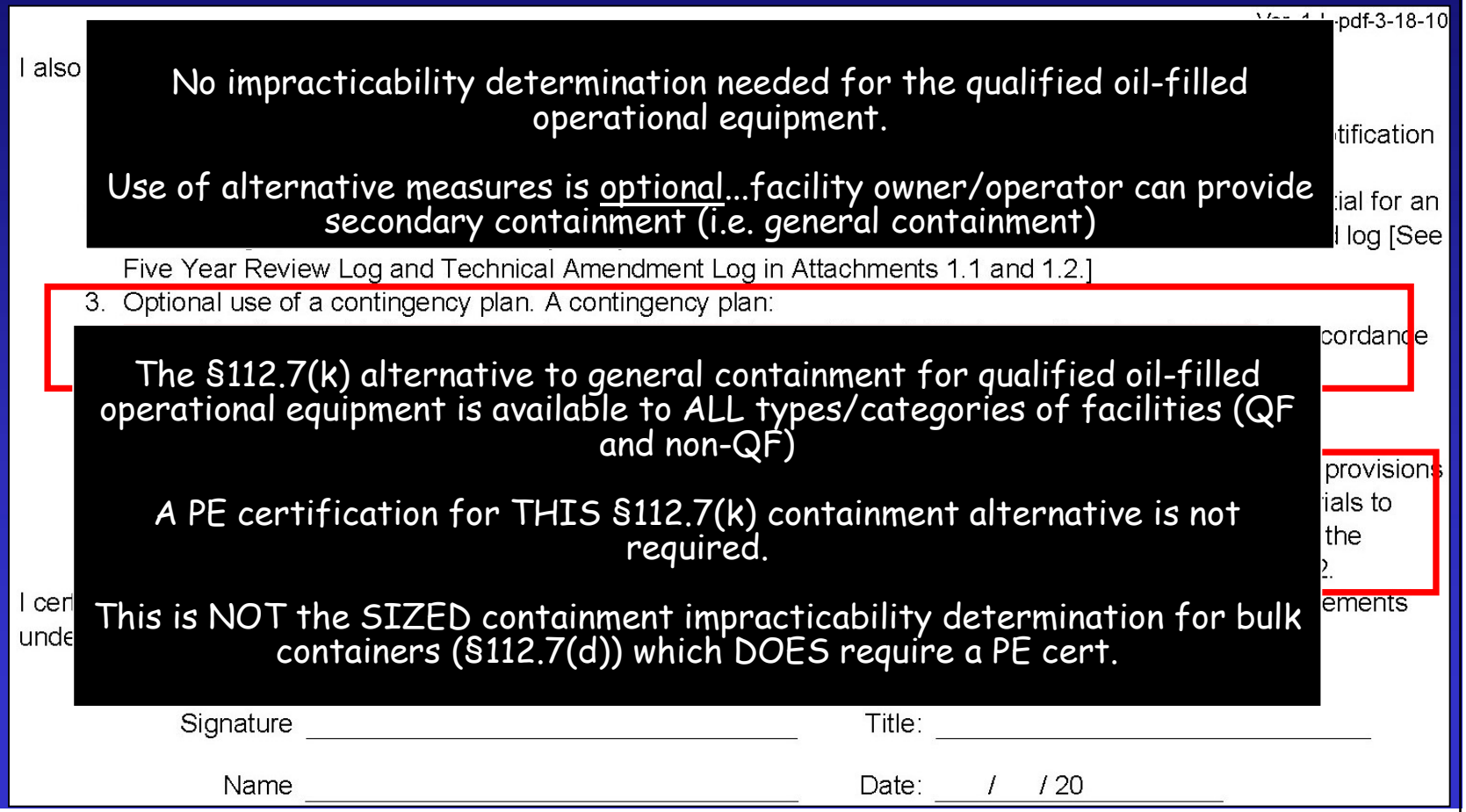
- Flow-through process systems
- E.g. process vessels, reactors, fermentors, oil treatment tanks, and distillation columns

Electrical

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

"Qualified Oil-Filled Operational Equipment"?

Speaking of general containment…



"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:

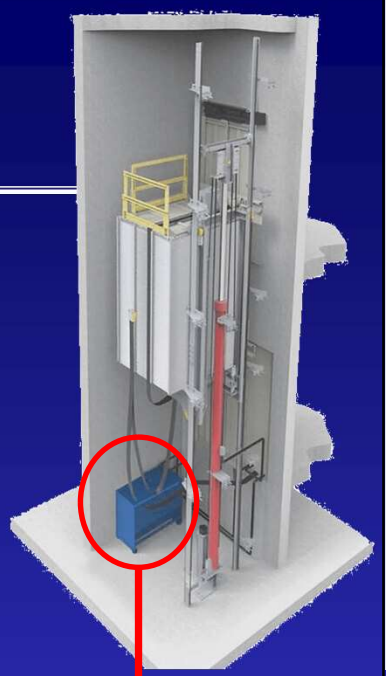
(A) An oil spill contingency plan following the provisions of part 109 of this chapter.

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

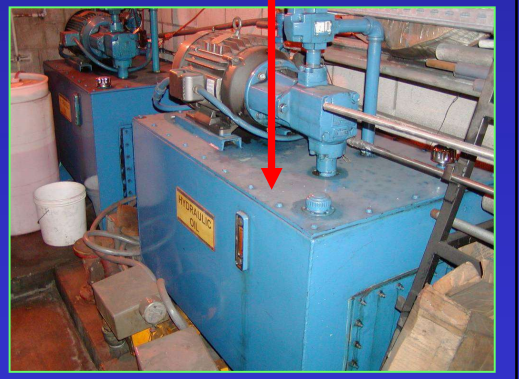
General Containment Practicality

- 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*

- Geoff Knight's 2023 CUPA session on Oil Spill Contingency Plans

CSU Dominguez Hills SPCC example

(hey... THEY posted it...)

- Tier I QF
  - Lots of OFE:
    - ✦OFEE: Transformers
    - ✦OFOE: Elevator hydraulic systems
- Type of containment required?
  - Likely quantity released from typical failure mode *(your opinion)?*

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III. Plan Requirements

1. Oil Storage Containers (§112.7(a)(3)(i)):

Table G-2 Oil Storage Containers and Capacities

This table includes a complete list of all oil storage containers (aboveground containers[a] and completely buried tanks[b]) with capacity of 55 U.S. gallons or more, unless otherwise exempt from the rule. For mobile/portable containers, an estimated number of containers, types of oil, and anticipated capacities are provided. ☒

Oil Storage Container *(indicate whether aboveground (A) or completely buried (B))*	Type of Oil	Shell Capacity (gallons)
A – Steel Tank, Facility Services	Unleaded Gasoline	983.5
A – Steel Tank, Facility Services	Unleaded Gasoline	983.5
A – Steel Tank, Facility Services	Diesel	500
A – Steel Drum, Central Plant	Vacuum Pump Oil	55
A – Steel Drum, Central Plant	Waste Oil	55
A – Steel Drum, Auto Shop at Facility Services	Waste Oil	55
A – Steel Tank, Student Union, Loading Dock near propane	Waste Cooking Oil	160
A – Emergency Generator, Located at Central Plant but used for Science and Innovation Building	Diesel	195.5
A – Emergency Generator, Library	Diesel	195
A – Emergency Generator, Gym	Diesel	90
A – Emergency Generator, Between Welch Hall and Health Center	Diesel	1,000
A – Transformer, P5046772, Facility Services	Transformer Oil	270
A – Transformer, CMSCPHV6-5, CA Academy of Math and Science (CAMS)	Transformer Oil	361
A – Transformer, EACSUBSBS54, East Academic Complex	Transformer Oil	271
A – Transformer, SCC-004-HV5-6, School of Education	Transformer Oil	290
A – Transformer, P5063207, Pueblo Dominguez SH-1, BLDG F	Transformer Oil	192
A – Transformer, CPHV6-4, Pueblo Dominguez SH-2, BLDG X	Transformer Oil	195
A – Transformer, Extended Education Center	Transformer Oil	203
A – Transformer, JWH SUB SHC 200HV1&2 T1, Welch Hall	Transformer Oil	272
A – Transformer, JWH SUB SHC 200HV1&2 T2, Welch Hall	Transformer Oil	272
A – Transformer, South Library Building, Room 1921	Transformer Oil – Silicon Dielectric Fluid	440
A – Transformer, T-52, Science and Innovation Building	Transformer Oil – BIOTEMP Dielectric Fluid	300
A – Steel Tank, Elevator, Natural Science and Math Room E-033	Hydraulic Oil	110
A – Steel Tank, Elevator, Social & Behav. Science Room A122	Hydraulic Oil	100
A – Steel Tank, Elevator, University Theatre Room A-002	Hydraulic Oil	55
A – Steel Tank, Elevator #1, Welch Hall, Room E-162	Hydraulic Oil	80
A – Steel Tank, Elevator #2, Welch Hall, Room E-162	Hydraulic Oil	80

Facility Name: CSU Dominguez Hills Page 3 Tier I Qualified Facility SPCC Plan

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If no containment is provided (that's what THIS – in this column tells me)… OSCP

Combining all/every failure mode and the generic discharge potential <1 – max capacity makes planning for the most likely release from the typical failure mode difficult.

BUT… Based on this table, how much general containment do they need? (I've never been to CSUDH)

Table G-4 Containers with Potential for an Oil D

Area	Type of failure (discharge scenario)	Potential discharge volume (gallons)	D fl u d		
Services			East	Contingency Plan)	
					-
					-
A – Transformer Oil, SCC-004-HV5-6, School of Education	Fitting leak, seam failure	<1 – 290	Southwest	5-10 gal pit for incidental spills (refer to Oil Spill Contingency Plan)	-
A – Transformer Oil, P5063207, Pueblo Dominguez SH-1, BLDG F	Fitting leak, seam failure	<1 – 192	Northwest	5-10 gal pit for incidental spills (refer to Oil Spill Contingency Plan)	-
A – Transformer Oil, CPHV6-4, Pueblo Dominguez SH-2, BLDG X	Fitting leak, seam failure	<1 – 195	Radial, West	5-10 gal pit for incidental spills (refer to Oil Spill Contingency Plan)	-
A – Transform Center		<1 – 203	Northwest	5-10 gal pit for incidental spills (refer to Oil Spill Contingency Plan)	-
A – Transform 200HV1&2 T		<1 – 272	Northeast, West	10-15 gal pit for incidental spills (refer to Oil Spill Contingency Plan)	-
A – Transformer Oil, JWH SUB SHC 200HV1&2 T2, Welch Hall	Fitting leak, seam failure	<1 – 272	Northeast, West	10-15 gal pit for incidental spills (refer to Oil Spill Contingency Plan)	-
A – Transformer Oil, South Library Building, Room 1921	Fitting leak, seam failure	<1 – 440	Radial, Southwest	Refer to Oil Spill Contingency Plan	-
A – Transformer Oil, T-52, Science and Innovation Building	Fitting leak, seam failure	<1 – 300	Radial, Northwest	Refer to Oil Spill Contingency Plan	-
A – Hydraulic Oil, Steel Tank, Elevator, Natural Science and Math, Room E-033	Fitting leak, seam failure, tank overfill	<1 – 110	Radial	Refer to Oil Spill Contingency Plan	-
A – Hydraulic Oil, Steel Tank, Elevator, Social & Behav. Science, Room A122	Fitting leak, seam failure, tank overfill	<1 – 100	Radial, N-NW	Refer to Oil Spill Contingency Plan	-

Facility Name: CSU Dominguez Hills Page 6 Tier I Qualified Facility SPCC Plan

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ATTACHMENT 2 – Oil Spill Contingency Plan and Checklist

An oil spill contingency plan and written commitment of resources is required for:

- Flowlines and intra-facility gathering lines at oil production facilities and
- Qualified oil-filled operational equipment which has no secondary containment.

An oil spill contingency plan meeting the provisions of 40 CFR part 109, as described below, and a written commitment of manpower, equipment and materials required to expeditiously control and remove any quantity of oil discharged that may be harmful is attached to this Plan.	☒

Complete the checklist below to verify that the necessary operations outlined in 40 CFR part 109 - Criteria for State, Local and Regional Oil Removal Contingency Plans - have been included.

Table G-15 Checklist of Development and Implementation Criteria for State, Local and Regional Oil Removal Contingency Plans (§109.5)[a]	
(a) Definition of the authorities, responsibilities and duties of all persons, organizations or agencies which are to be involved in planning or directing oil removal operations.	☒
(b) Establishment of notification procedures for the purpose of early detection and timely notification of an oil discharge including:	
(1) The identification of critical water use areas to facilitate the reporting of and response to oil discharges.	☒
(2) A current list of names, telephone numbers and addresses of the responsible persons (with alternates) and organizations to be notified when an oil discharge is discovered.	☒
(3) Provisions for access to a reliable communications system for timely notification of an oil discharge, and the capability of interconnection with the communications systems established under related oil removal contingency plans, particularly State and National plans (e.g., NCP).	☒
(4) An established, prearranged procedure for requesting assistance during a major disaster or when the situation exceeds the response capability of the State, local or regional authority.	☒
(c) Provisions to assure that full resource capability is known and can be committed during an oil discharge situation including:	
(1) The identification and inventory of applicable equipment, materials and supplies which are available locally and regionally.	☒
(2) An estimate of the equipment, materials and supplies which would be required to remove the maximum oil discharge to be anticipated.	☒
(3) Development of agreements and arrangements in advance of an oil discharge for the acquisition of equipment, materials and supplies to be used in responding to such a discharge.	☒
(d) Provisions for well defined and specific actions to be taken after discovery and notification of an oil discharge including:	
(1) Specification of an oil discharge response operating team consisting of trained, prepared and available operating personnel.	☒
(2) Predesignation of a properly qualified oil discharge response coordinator who is charged with the responsibility and delegated commensurate authority for directing and coordinating response operations and who knows how to request assistance from Federal authorities operating under existing national and regional contingency plans.	☒
(3) A preplanned location for an oil discharge response operations center and a reliable communications system for directing the coordinated overall response operations.	☒
(4) Provisions for varying degrees of response effort depending on the severity of the oil discharge.	☒
(5) Specification of the order of priority in which the various water uses are to be protected where more than one water use may be adversely affected as a result of an oil discharge and where response operations may not be adequate to protect all uses.	☒
(6) Specific and well defined procedures to facilitate recovery of damages and enforcement measures as provided for by State and local statutes and ordinances.	☒

[a] The contingency plan must be consistent with all applicable state and local plans, Area Contingency Plans, and the National Contingency Plan (NCP)

Facility Name: CSU Dominguez Hills Page 17 Tier I Qualified Facility SPCC Plan

CSUDH ENVIRONMENTAL HEALTH & SAFETY

Table 1.1 from the OSCP

Anyone see the first problem?

112(k) is not applicable (available) to Oil-Filled Electrical Equipment

Only OF Operational Equipment

Table 1.1 – Oil-filled Operational Equipment/Tanks

Oil Storage Container/ Equipment and Location	Volume (gallons)
Transformer Oil, P5046772, Facility Services, West Exterior (Figure C-6)	270
Transformer Oil, CMSCPHV6-5, CA Academy of Math and Science (CAMS), North Exterior (Figure C-2)	361
Transformer Oil, EACSUBSBS54, East Academic Complex (EAC), Southeast Exterior (Figure C-3)	271
Transformer Oil, SCC-004-HV5-6, School of Education (COE), South Exterior (Figure C-3)	290
Transformer Oil, P5063207, BLDG A-Pueblo Dominguez SH-1, Building F, Northeast Exterior (Figure C-5)	192
Transformer Oil, CPHV6-4, BLDG X-Pueblo Dominguez SH-2, Building X, Northeast Exterior (Figure C-5)	195
Hydraulic Oil, Steel Tank, Elevator, Natural Science and Math (NSM), Room E-033, Basement (Figure C-8)	110
Hydraulic Oil, Steel Tank, Elevator, Social & Behav. Science (SBS), Room A122, First Floor (Figure C-9)	100
Hydraulic Oil, Steel Tank, Elevator, University Theatre, Room A-002, Basement (Figure C-10)	55
Hydraulic Oil, Steel Tank, Elevator #1, Welch Hall, Room E-162, First Floor (Figure C-11)	80
Hydraulic Oil, Steel Tank, Elevator #2, Welch Hall, Room E-162, First Floor (Figure C-11)	80
Hydraulic Oil, Steel Tank, Elevator #3, Welch Hall, Room E-162, First Floor (Figure C-11)	80
Hydraulic Oil, Steel Tank, Elevator, Lacorte Hall, Room A008, Basement (Figure C-15)	80

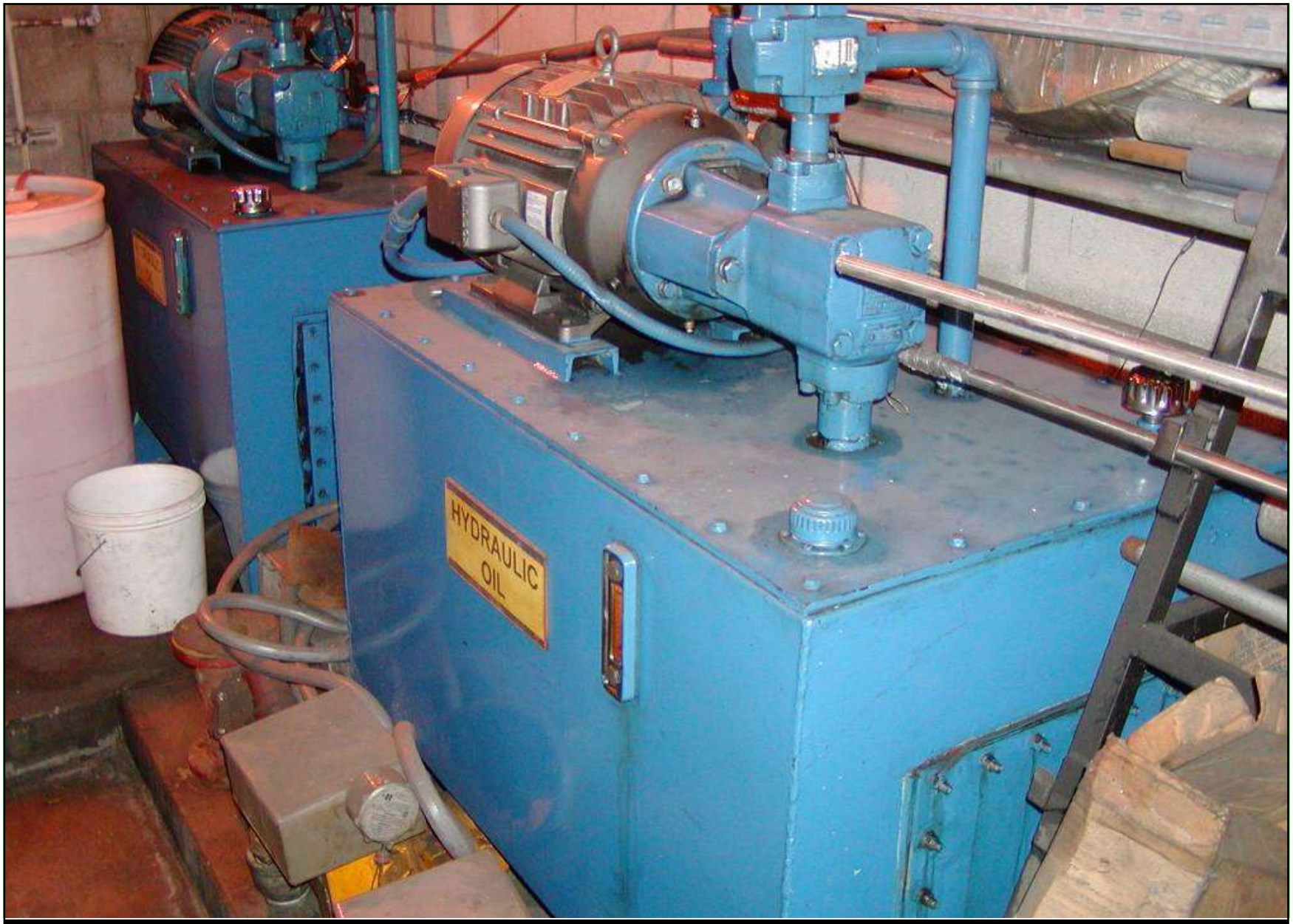
Table 1.2 from the OSCP

Anyone see the containment impracticability issue (or inconsistency)? Remember what you think would be the most likely release volume

Oil Storage Container/ Equipment and Location	Volume (gallons)	Direction of flow for uncontained discharge	Closest drainage discharge location	Risk Assessment (High, Medium, Low)
				• Adjacent to driveway and parking lot with potential for vehicular traffic (parking curb present). ➔ Medium
Hydraulic Oil, Steel Tank, Elevator, Natural Science and Math (NSM), Room E-033, Basement (Figure C-8)	110	Radial	• None (no drains within room or vicinity; • 15.5 ft to main elevator electrical pit in hallway outside room.	• On concrete floor; • In basement; • Within locked room. ➔ Low
Hydraulic Oil, Steel Tank, Elevator, Social & Behav. Science (SBS), Room A122, First Floor (Figure C-9)	100	• Radial • North/Northwest	• 19 ft North to HVAC condensate drain (sewer) in room; • 19.5 ft Northwest to sewer floor drain in room.	• On concrete floor w/ an adjacent 5-10 gal vault housing electrical conduits; • Within locked room. ➔ High
Hydraulic Oil, Steel Tank, Elevator, University Theatre, Room A-002, Basement (Figure C-10)	55	• Radial • North/Northwest	None (no drains within room or vicinity.	• On concrete floor; • In basement; • Within locked room. ➔ Low
Hydraulic Oil, Steel Tank, Elevator #1, Welch Hall, Room E-162, First Floor (Figure C-11)	80	• Radial • Southeast	20 ft Southeast to storm drain in hall/courtyard area outside room.	• On concrete floor; • Threshold at door; • Within locked room. ➔ Medium
Hydraulic Oil, Steel Tank, Elevator #2, Welch Hall, Room E-162, First Floor (Figure C-11)	80	• Radial • Southeast	27 ft Southeast to storm drain in hall/courtyard area outside room.	• On concrete floor; • Threshold at door; • Within locked room. ➔ Medium
Hydraulic Oil, Steel Tank, Elevator #3, Welch Hall, Room E-162, First Floor (Figure C-11)	80	• Radial • Southeast	39 ft Southeast to storm drain in hall/courtyard area outside room.	• On concrete floor; • Threshold at door; • Within locked room. ➔ Medium
Hydraulic Oil, Steel Tank, Elevator	80	• Radial	0 ft North to sewer drain in hallway	• On concrete floor; ➔ Medium

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.

13 Pr

3.2 Fuel Oil Receiving Station

Filling of the fuel oil storage tank is a manual operation. The truck discharge hose is connected to the fill station connection, the tank inlet valves are opened, and the truck pump is used to transfer the fuel into the storage tank.

Should the truck not be equipped with a pump, a fuel oil transfer pump may be utilized into the storage tank. Under this scenario, the first manual valve after the fill station normal suction valve to pump A is closed, the valve from the unloading station to p opened, the valve connecting the pump A discharge to the storage tank inlet is oper valve to the tank is opened. After the truck connections have been completed, pum placing the unload selector switch to the "UNLOAD A" position.

When operating in this mode, the operators are instructed to not leave the pump unattended. The pump operator observes the discharge pressure gage closely. Should the discharge pressure decrease significantly, the unload selector switch is immediately moved to the "OFF" position to stop the transfer pump. The operators are warned that failure to do so might result in severe pump damage from running the pump without fuel.

Flow, a l be

Experience does or unloading equipment, tank a source of discharge). All sp parator.

Don't be these guys either

What's the Point?

For *each* bulk tank or container (area)

Identify the possible (likely) failure modes

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

Determine the direction of flow

How much containment is needed to keep this volume and flow out of the nav. water/storm drain, etc.? (PASSIVE, ACTIVE, COMBO?)

THIS IS THE CONTAINMENT THE FACILITY MUST HAVE IN PLACE

General Containment Criteria

40 CFR 112.7(c)

- **Every single possible failure mode?**
  - **No – not an exhaustive evaluation**
  - **Subjective… rule provides examples:**
    - "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)…"

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

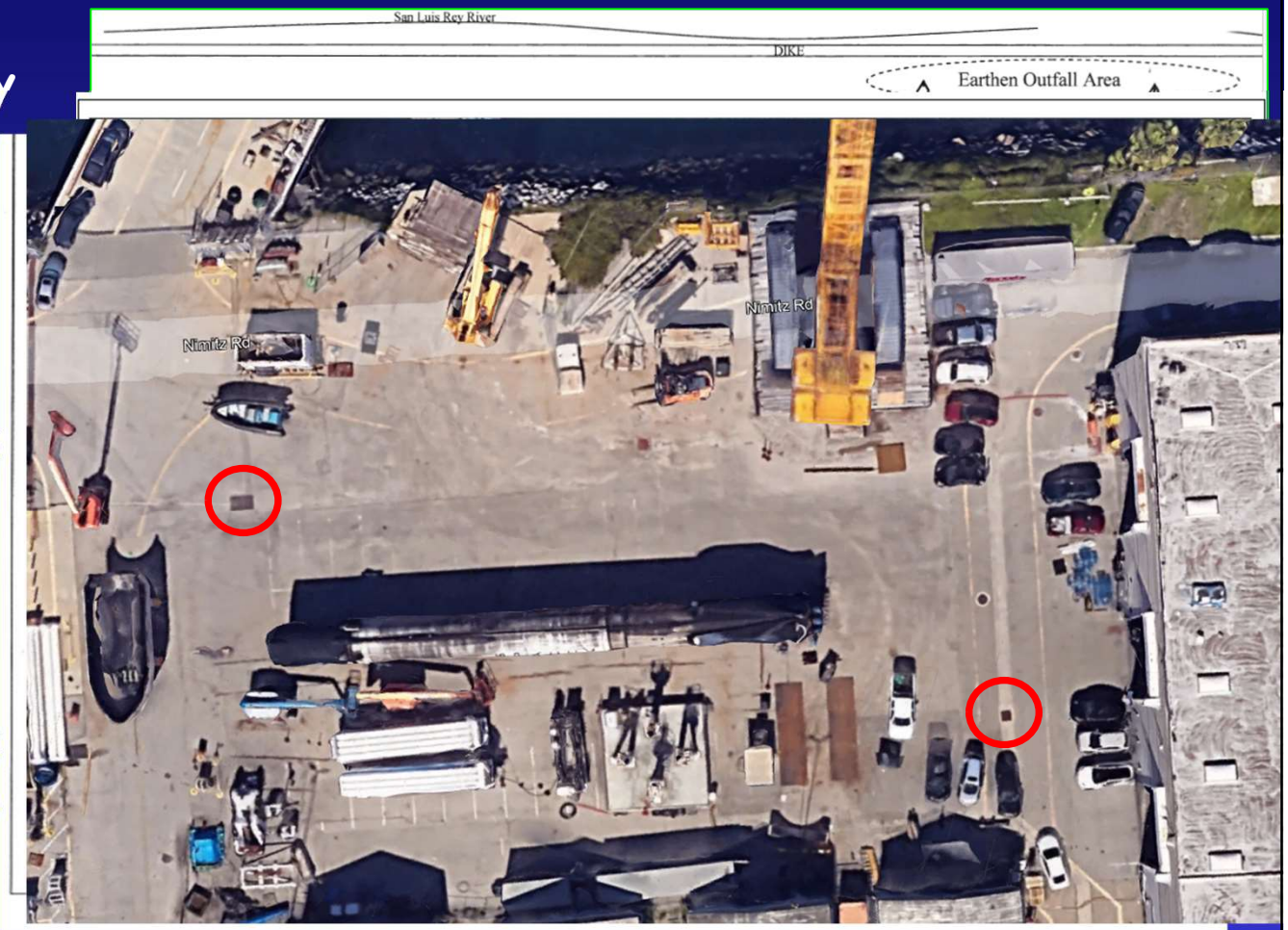
For each failure mode...estimate the most likely release volume and rate

- 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

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

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 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)					

[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

Completed sample in a minute…

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

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.

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Bulk Storage Containers and Mobile/Portable Containers[b]					
Oil-filled Operational Equipment (e.g., hydraulic equipment, transfor					
Piping, Valves, etc.					
Product Transfer Areas (location where oil is loaded to or from a cor					
Other Oil-Handling Areas or Oil-Filled Equipment (e.g. flow-through					

[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

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).

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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.

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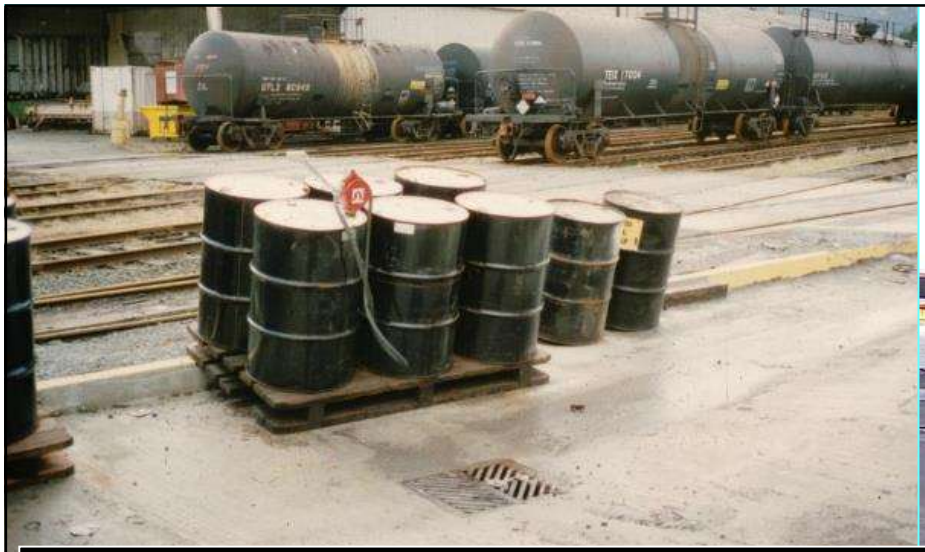
Bulk Storage Containers and Mobile/Portable Containers[b]					
Oil-filled Operational Equipment (e.g., hydraulic equipment, transformers)[c]					
Piping, Valves, etc.					
Product Transfer Areas (location where oil is loa					
Other Oil-Handling Areas or Oil-Filled Equipmer					

Where do these scenarios and numbers come from?

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

[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



Oil (petroleum) handling and transfer areas
Containment for most likely/typical failure (general containment) reqd.
Passive or active measures
?: Spill kit and facility response OK...? Time to detect + time to respond + time to deploy

Oil (petroleum) transfer areas (piping)
Containment for most likely/typical failure (general containment) reqd.

Red-face Giggle Test for Active Measures

Uhhhh….

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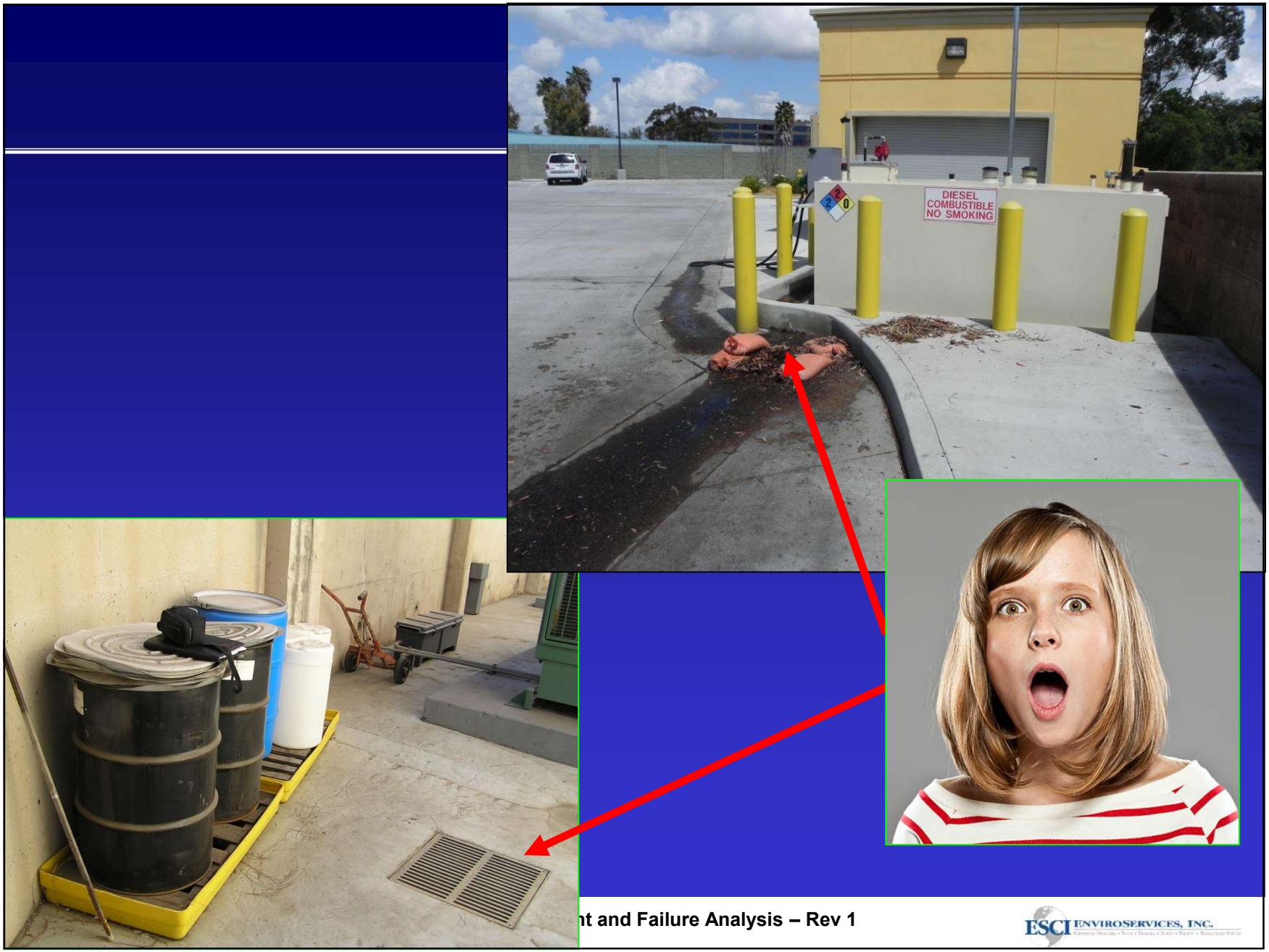
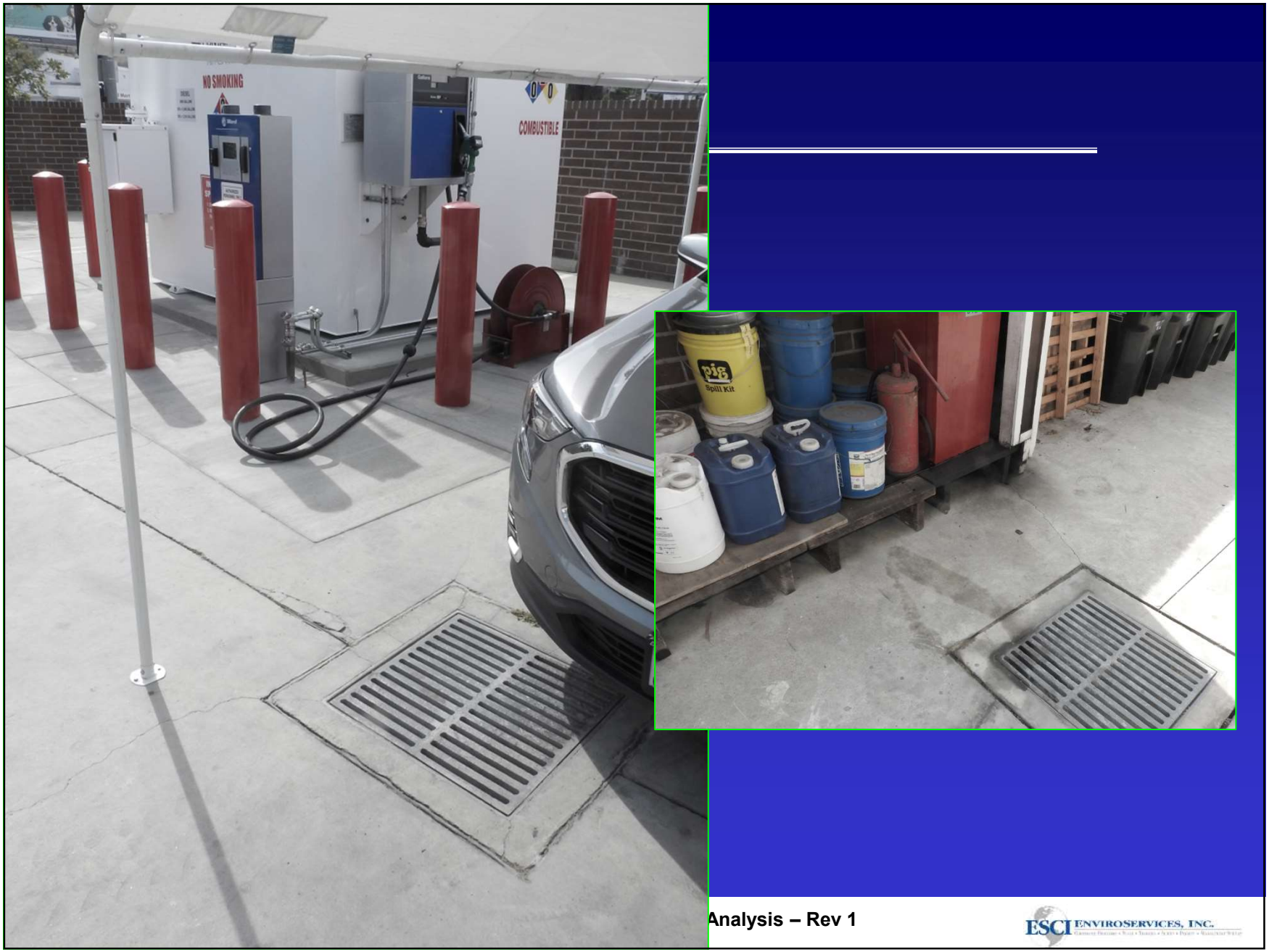




Ver. 1-L-pdf-3-18-10

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 loa					
Other Oil-Handling Areas or Oil-Filled Equipmer					

[a] Use one of the following methods of secondary conta ting, gutters, or other drainage systems; (4) 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 Plan

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.

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

ESCI EnviroServices, Inc.

Failure Analysis (examples)

County – Department of Environmental Health, of the occurrence of a spill or other release of over 42 gallons of oil into a waterway.

SPCC Plan Organization [40 CFR

A Facility Response Plan (under §11 facility and one has not been submitte to describe procedures to be used in t will make them readily usable in t supporting information is available in t

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

5.4 *Failure Analysis [§112.7(b)]*

Based on experience or other information that indicates a reasonable potential for equipment failure (such as loading or unloading equipment, tank overflow, rupture, or leakage), the prediction of spill flow direction, rates of flow, and quantities that could be discharged have been determined and are presented below in Table 5-2 'Spill Predictions'. If not listed, a tank or system was determined, based on experience or other information, to not pose a reasonable potential for equipment failure which could result in any discharge to navigable waters.

Table 5-2 Failure Analysis

Potential Event	Maximum Potential Release Volume (gallons)[4]	Maximum Potential Discharge Rate[5]	Direction of Flow[6]	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	Concrete secondary
Tank overfill	60	20 gal/min		
Piping failure				
Loading or ur failure				
Used Oil Tar				
Failure of AS puncture belc				

[4] Maximum pol identified event that event. Dis managing leak
[5] Maximum pol experience or d facility personn
[6] Assumes cont

Spill Prevention, Co
February 2009 (ver 1

Potential Event	Maximum Potential Release Volume (gallons)	Maximum Potential Discharge Rate	Direction of Flow	Secondary Containment
#3 Oils Conex 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	1,000 to 2,000	Gradual to	N to drainage ditch way	Secondary containment
			inage ditch way	Secondary containment, fill procedures & spill kit
			inage ditch way	Partial secondary containment, line inspection before use, & spill kit
			inage ditch way (mobile - locations)	Secondary containment on vehicle, spill kits
			inage ditch way (mobile)	Secondary containment on vehicle, spill kits
			inage ditch way (mobile)	Secondary containment on vehicle, line inspection before use & spill kits

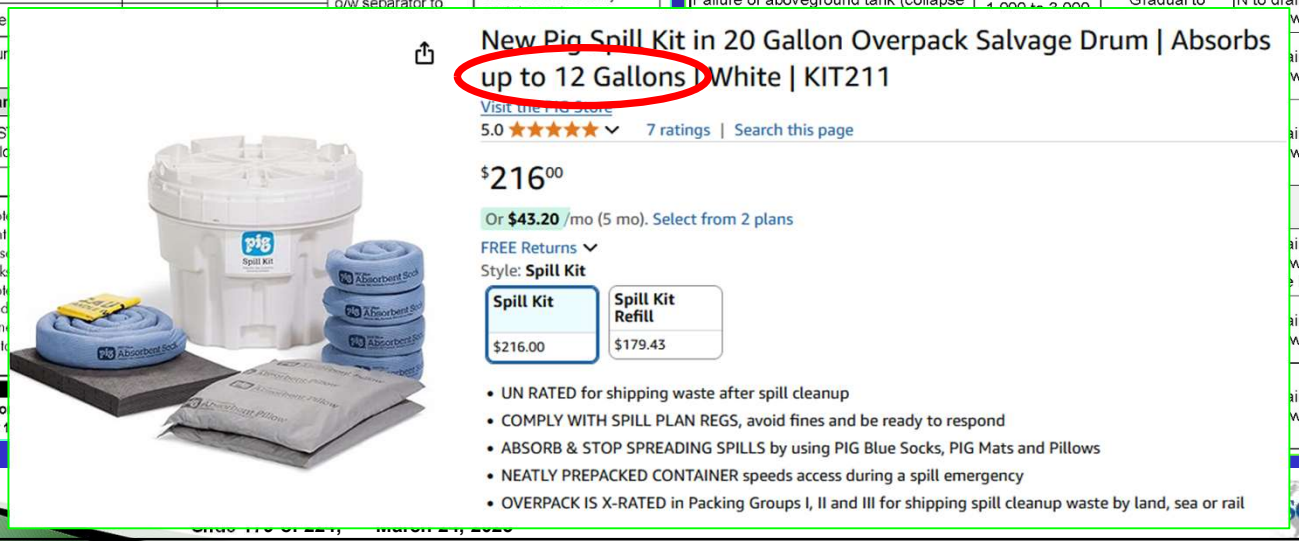


Table G-4 Containers with Potential for an Oil Discharge

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

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

Why the difference?

Est. 5 min. to detect, respond and stop flow.

Potential Event	Maximum Potential Release Volume (gallons)[4]	Maximum Potential Discharge Rate[5]	Direction of Flow[6]	Secondary Containment or Other Spill Diversion
Bulk Gasoline 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		

Let's Permeate Through Containment and Failure Analysis – Rev 1
Slide 181 of 224; March 24, 2025

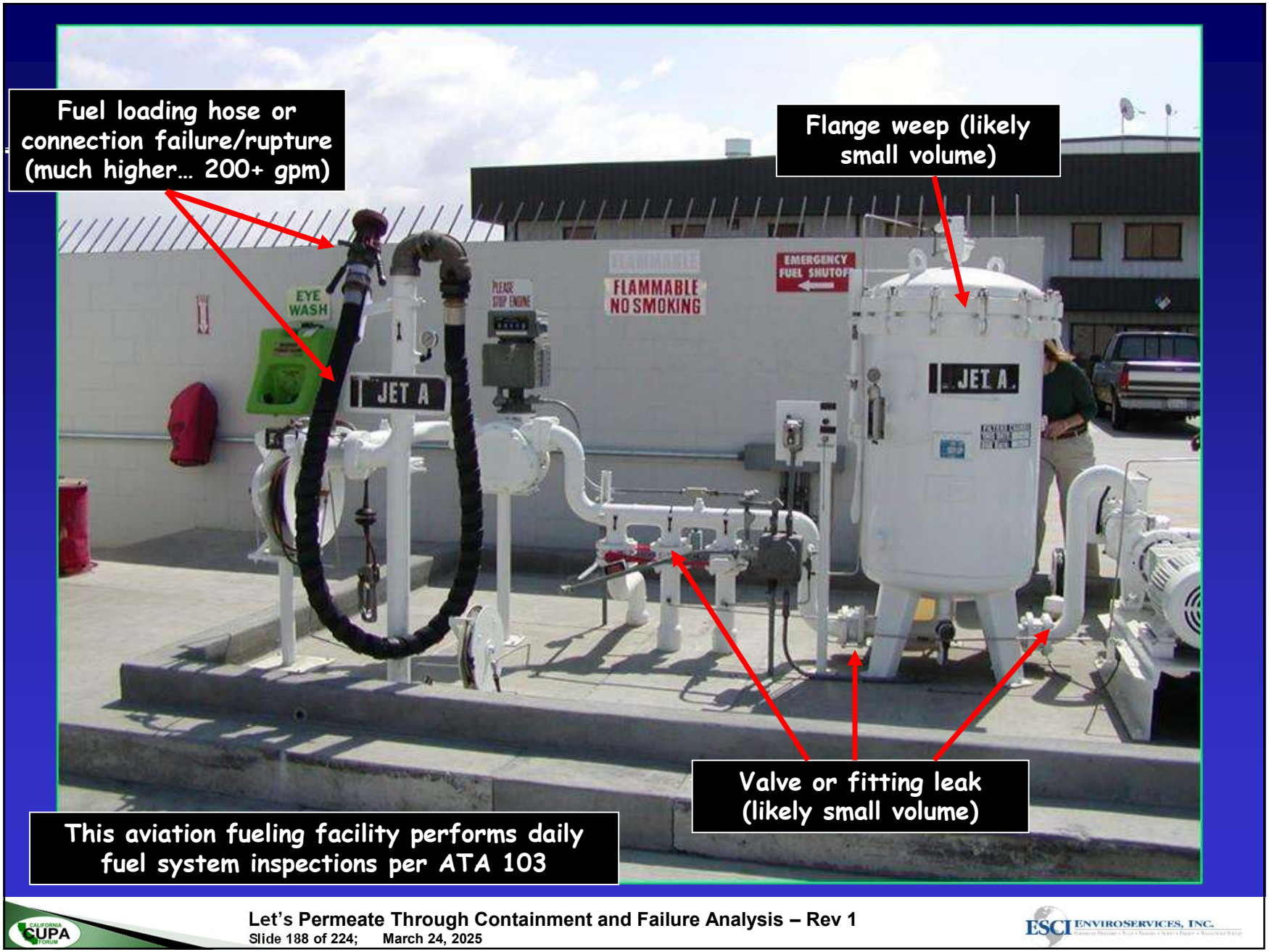
**Spill supplies ('DRIZIT') staged at the tank loading/unloading area.
Plan states typical failure mode, volume and rate is loading hose rupture with 60 gallons released (30 seconds to respond at 120 gpm pump rate).
Flow direction (per Plan) is down-gradient to the left.
Must evaluate whether the 1/3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

Will a tank loading hose or connection valve failure always flow into the general containment sump?

At what tank level is this tank full – per the gauge?

How does a well marked gauge (or tank filler knowledge) contribute to likely release volume?

More failure mode examples



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!**

Remote fill?
Recognition of an overfill?

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Piping/fittings inside containment? – watch your assumptions and field verify.

Overfill prevention – sight tube

No wonder they never overfill this tank!

Let's Permeate Through Containment and
Slide 193 of 224; March 24, 2025

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

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

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I hate that table…..

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

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]					

See following pages

Spill Prediction (examples using my own format)

Table 5-2 Spill Prediction

Potential Event	Maximum Potential Release Volume (gallons)[5]	Maximum Potential Discharge Rate[6]	Direction of Flow[7]	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				

[4] As of January 2009 – Calif. OES became the California Emergency Management Agency.
[5] 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 rat for that event. Discharge time factors assume trained vendor and facility personnel following relevant procedures f managing leaks or spills, and leaks from operational equipment occurring during facility operational hours.
[6] 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.
[7] 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 Conex 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

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

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			_____ (total)
	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			_____ (total)
	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?			
ACTION TAKEN/ TO BE TAKEN	Is oil/water separator cleaning required?			
	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"

These containment curbs are only a few inches high… facility shouldn't accumulate *too* much storm water before draining

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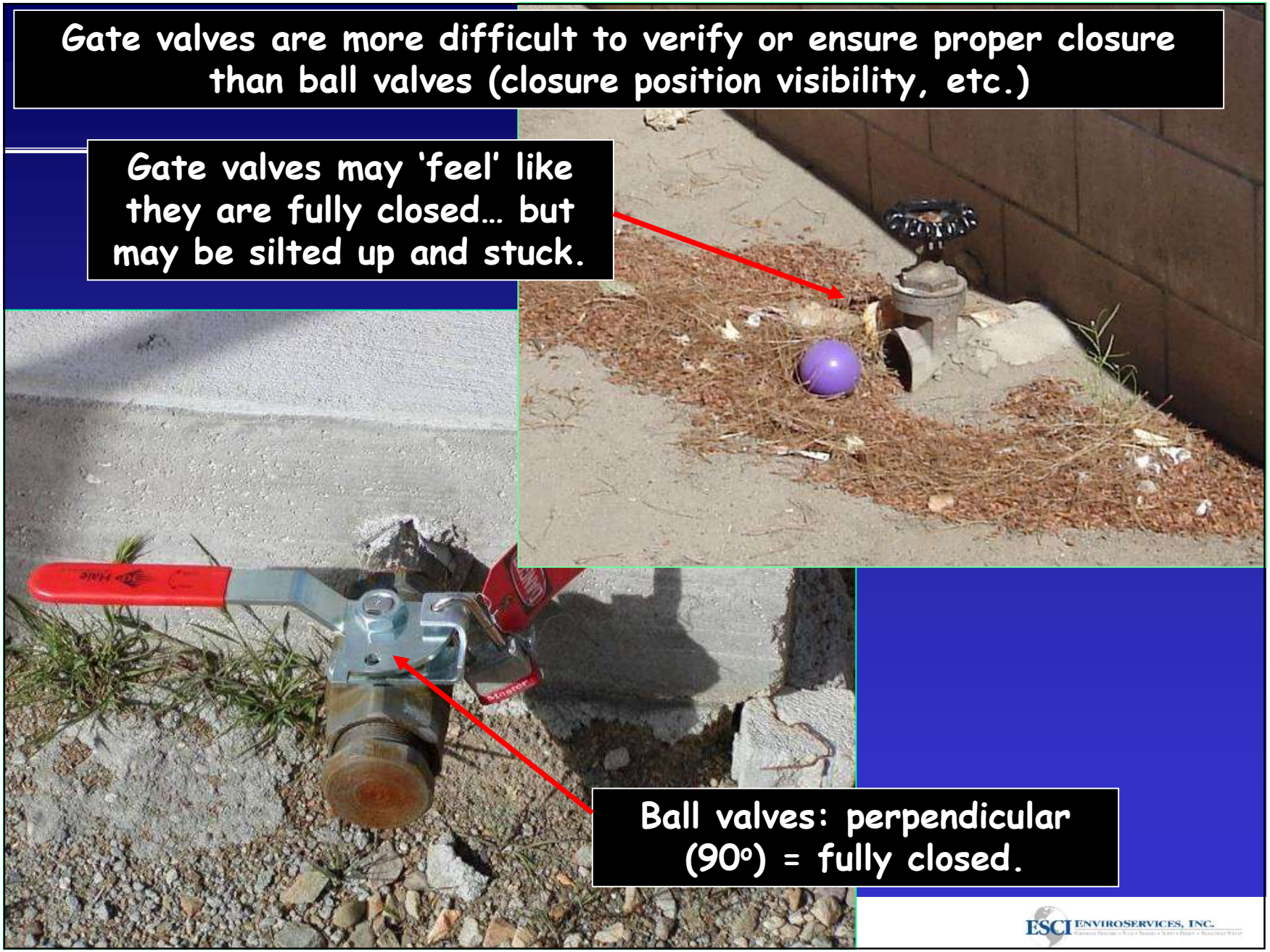
The facility stated they opened these drainage valves at 7 am to drain last night's rainfall. What happens when the FD comes inspecting at 3:30 pm.

Design vs operational compliance



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

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 Tier I Qualified Facility SPCC Plan

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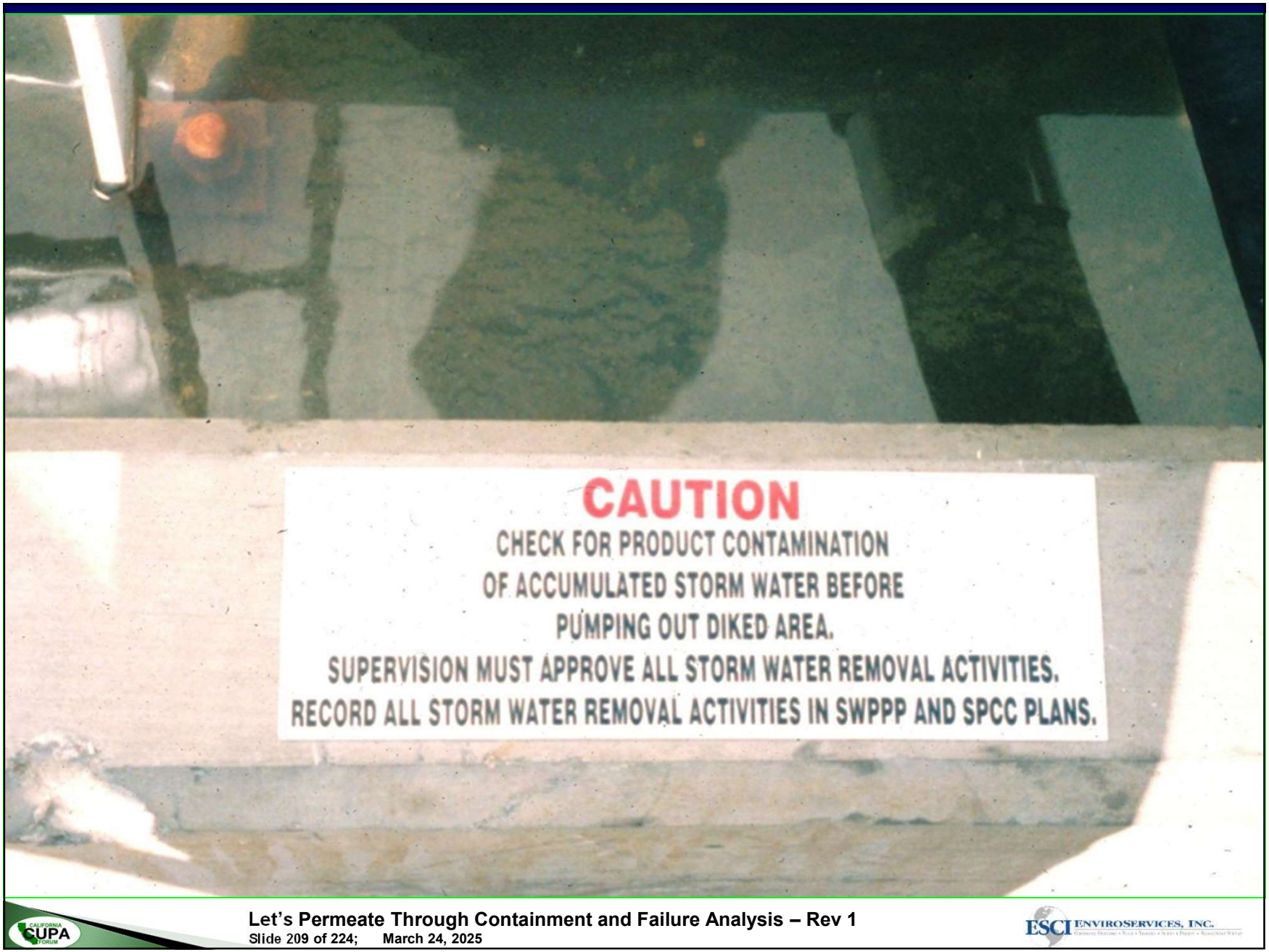
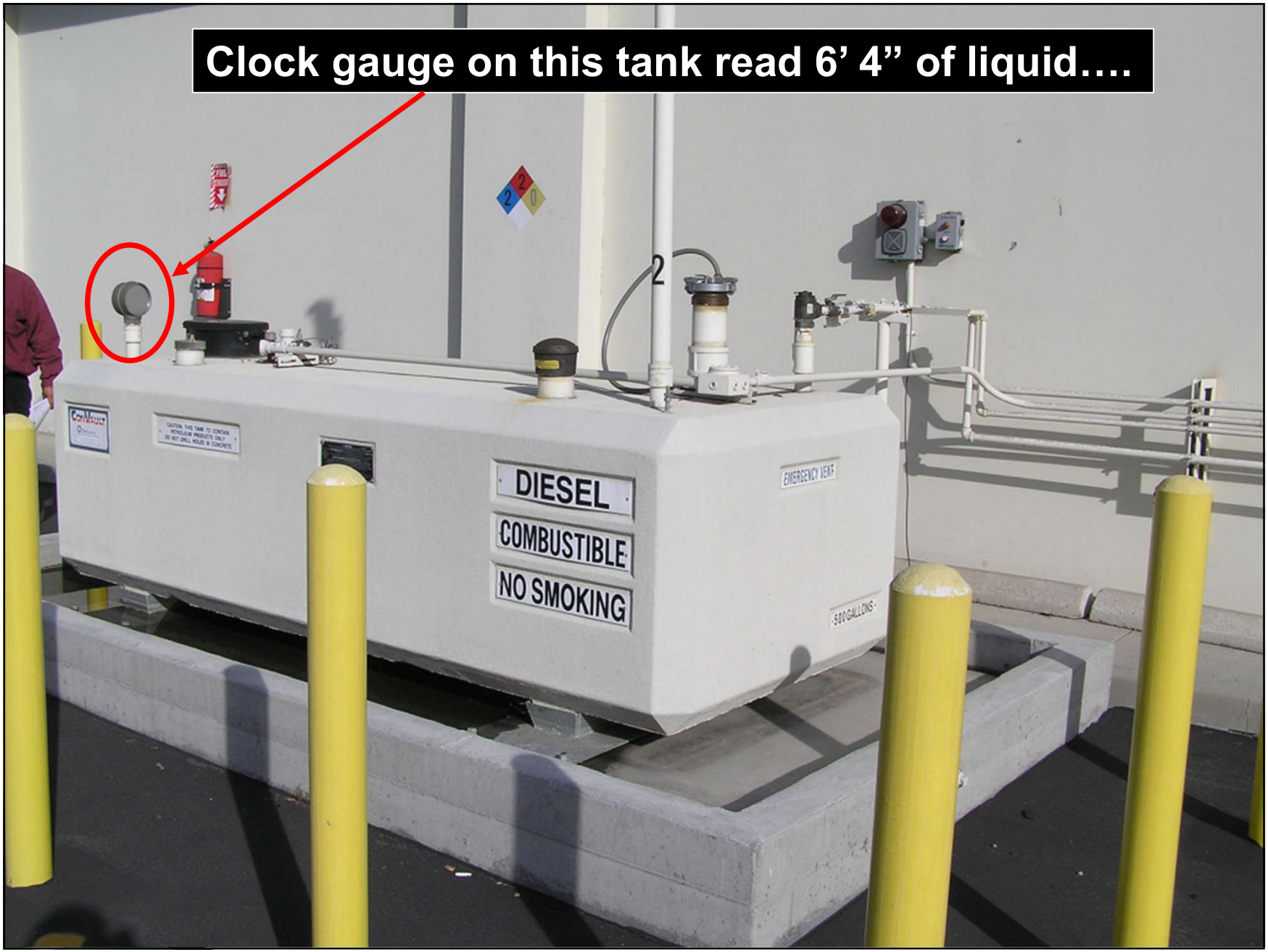


For some containment dikes/areas… there is so much oil residue, the facility would never be able to simply discharge the contained water in compliance. They could contain it as a waste, however. Letting it just accumulate may adversely impact the available containment volume. This facility is likely 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)).

Overfill Prevention

- Again: not just the engineering
  - Need procedures so personnel know what the numbers and alarms *mean*



Overfill Prevention

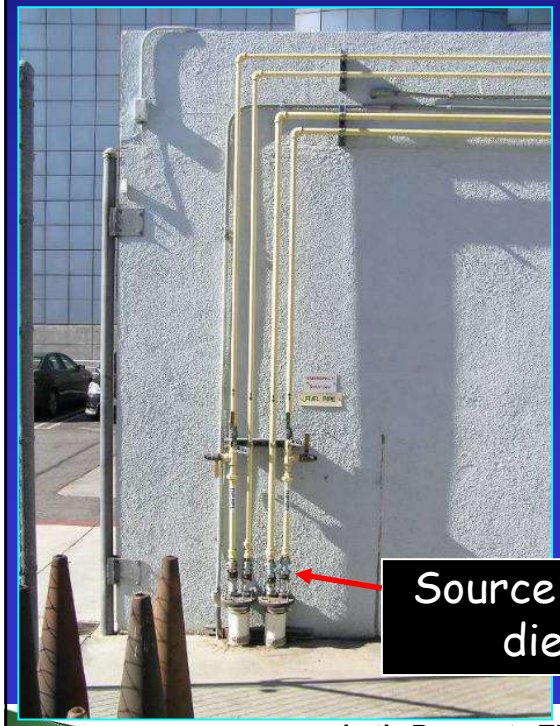
Direct audible or code signal communication between container gauger and pumping station

Fast response system for determining the liquid level (computer, or direct vision gauge, provided that someone is present to monitor gauges & the overall filling operation)

Overfill Prevention

- Don't forget: automatic high level shutoffs need love, too

85 gal double wall day tank



Source is 4,000 gal. diesel UST

What happens if the day tank level controller fails?

Not so obvious

The inspector should look into the secondary containment on this tank… there may have been a 'loss of oil from the container' and an accumulation of oil in the containment.

An obvious compliance issue (if oil accumulation is not promptly removed and discharge corrected)

In addition to discharge accumulation issues… there is also the containment impermeability issue

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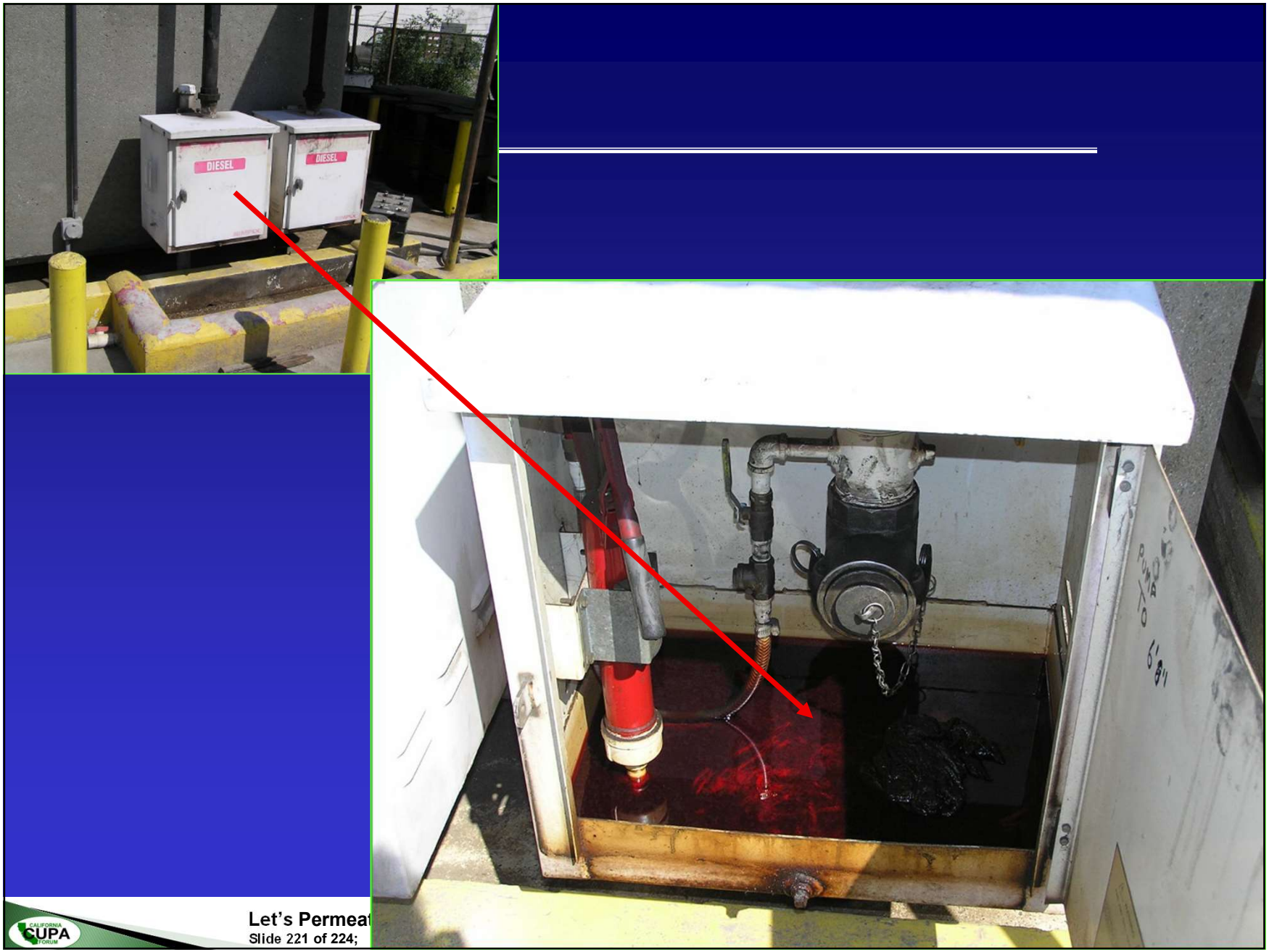

Final Thoughts

Remember:

Rule + Plan + Implementation = Joy