How to Prepare Your Own SPCC Plan:

A Step-by-Step Guide for Tier 1 Qualified Facilities

Using the US EPA Tier I SPCC Template

MODULE IV

Secondary Containment, Oil Spill Control & Spill Prediction

(69 slides + quiz)

ESCI ENVIROSERVICES, INC.

Page 3 Secondary Containment and Oil Spill Control Detail

2. **Secondary Containment and Oil Spill Control (§§112.6(a)(3)(i) and (ii), 112.7(c) and 112.9(c)(2)):**

Table G-3 Secondary Containment and Oil Spill Control	
Appropriate secondary containment and/or diversionary structures or equipment[a] is provided for all oil handling containers, equipment, and transfer areas to prevent a discharge to navigable waters or adjoining shorelines. The entire secondary containment system, including walls and floor, is capable of containing oil and is constructed so that any discharge from a primary containment system, such as a tank or pipe, will not escape the containment system before cleanup occurs.	☐

[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.

- **Simple Template wording of the requirement and a check box compliance affirmation**
  - **But containment requirements can be difficult to understand and challenging to ensure in practice**
- **To comply: You must understand the two SPCC-related containment requirements**
  - **'General' containment: THIS Table G-3**
  - **'Sized' containment: Table G-10 in Section A (page 9)**

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Page 9; Section A; Table G-10 (more later)

A. Onshore Facilities (excluding production) (§§112.8(b) through (d), 112.12(b) through (d)):

The owner or operator must meet the general rule requirements as well as requirements under this section. Note that not all provisions may be applicable to all owner/operators. For example, a facility may not maintain completely buried metallic storage tanks installed after January 10, 1974, and thus would not have to abide by requirements in §§112.8(c)(4) and 112.12(c)(4), listed below. **In cases where a provision is not applicable, write "N/A".**

Table G-10 General Rule Requirements for Onshore Facilities		N/A
Drainage from diked storage areas is restrained by valves to prevent a discharge into the drainage system or facility effluent treatment system, except where facility systems are designed to control such discharge. Diked areas may be emptied by pumps or ejectors that must be manually activated after inspecting the condition of the accumulation to ensure no oil will be discharged. [§§112.8(b)(1) and 112.12(b)(1)]	☐	☐
Valves of manual, open-and-closed design are used for the drainage of diked areas. [§§112.8(b)(2) and 112.12(b)(2)]	☐	☐
The containers at the facility are compatible with materials stored and conditions of storage such as [illegible] [§§112.8(b)(3) and 112.12(b)(3)]	☐	☐
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). [§112.8(c)(2)(i)]	☐	☐
Drainage of rainwater from [illegible] 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) and 112.12(c)(4)]		
• Tanks have corrosion protection with coatings or cathodic protection compatible with local soil conditions.	☐	☐
• Tanks have corrosion protection with coatings or cathodic protection compatible with local soil [illegible]	☐	☐
[illegible] tank integrity. [§112.8(c)(6) and §112.12(c)(6)]	☐	☐
[illegible] **Inspection Log and Schedule and Bulk Storage Container Inspection Schedule in Attachments 3.1 and 3.3.**[§112.8(c)(6) and §112.12(c)(6)(i)]	☐	☐
Outsides of bulk storage containers are frequently inspected for signs of deterioration, discharges, or accumulation of oil inside diked areas. **[See Inspection Log and Scheduled Schedule in Attachment 3.1]**	☐	☐
[illegible] which are shop-fabricated, constructed of [illegible] insulation, formal visual inspection is conducted [illegible] personnel performing tests and inspections are documented. **[See Inspection Log and Schedule and Bulk Storage Container Inspection Schedule**	☐	☐

- **'Sized' containment requirement for bulk [illegible]**
- **'Sized' containment requirement stated in Table G-10**
  - **Applies to bulk tanks & containers**
    - **Stationary and portable**
  - **Does NOT apply to oil filled equipment, piping, loading/unloading areas, oil handling areas**
    - **The 'general' containment (Table G-3 on Page 3) applies to those things**

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Containment Requirements Review and Detail

- **Providing adequate oil/petroleum containment is one of the most important aspects of SPCC & APSA compliance**
- **But it can be confusing**
  - **Containment criteria for bulk storage containers is <u>different</u> than for oil-filled equipment and oil handling & loading/unloading areas**
- **Reviewing the requirements and seeing examples help you assure compliance**
  - **Besides simply checking a few boxes on the Template**

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Containment Summary: Two types of containment in the SPCC rule

1. **'Sized' containment** (40 CFR 112.6(a)(3)(ii) … in Table G-10)
   - **For bulk tanks & containers (stationary & portable)**
   - **100% containment of largest container capacity**
     - **Plus 'adequate' precipitation freeboard**
   - **Should be passive, engineered or constructed systems**
2. **'General' containment or other diversionary measures** (40 CFR 112.7(c) … in Table G-3)
   - **For oil-filled equipment, non-transportation tank trucks, piping and oil handling, loading, unloading & transfer areas**
   - **Sufficient to keep the 'most likely' oil discharge from reaching navigable waters prior to clean up**
   - **May be active or passive in design, deployment or operation**

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Helpful & Handy Reference

Available for download on the DEH website

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))
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))		Position to prevent nav. water discharge (112.6(a)(3)(ii))
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 H&SC 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(b)(4)).	Also must inspect if buried piping is exposed.

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

'Sized' 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 (e.g. 24 hours of a 25 year storm)
  - Specific methods are up to the facility
    - Template (Table G-3, Page 3 footnote 'a') lists the various methods to be used
      - **But sized containment should be passive, constructed / engineered measures**
  - Diked areas (walls and floor) must be sufficiently impervious to contain discharged oil until clean up (40 CFR 112.7(c))
    - Imperviousity is also a performance standard

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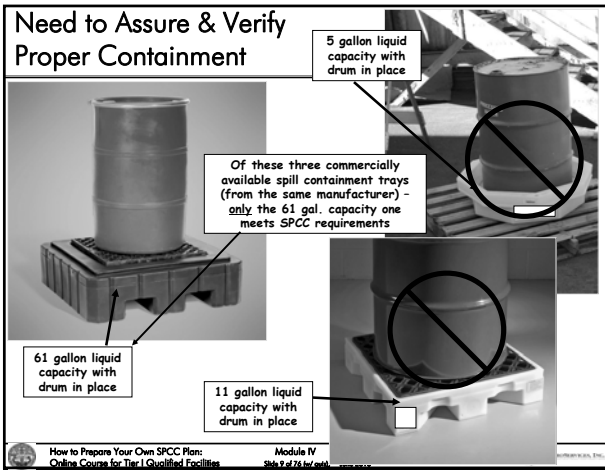
Capacity of Largest Container/Tank

This containment area would need to hold the capacity of the largest tank (silver one) plus some amount of precipitation (e.g. 6" of rain)

This containment area would need to hold the capacity of one 55 gallon drum. This is inside the building, so precipitation containment is not needed

Need to Assure & Verify Proper Containment



5 gallon liquid capacity with drum in place

Of these three commercially available spill containment trays (from the same manufacturer) – only the 61 gal. capacity one meets SPCC requirements

61 gallon liquid capacity with drum in place

11 gallon liquid capacity with drum in place

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The sorbent socks would not provide this oil drum storage area with proper 'sized' containment. It needs constructed or more permanent berms, curbs, dikes, etc.

The sock placement also does not render the containment impervious (a full drum release could easily escape).

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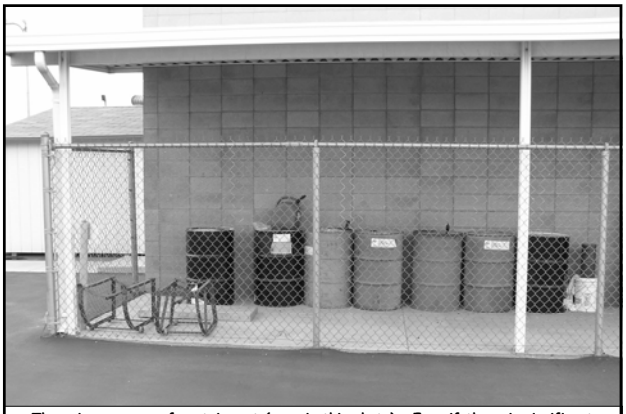

There is no means of containment (seen in this photo). Even if there is significant distance to the drain or property line, engineered containment in the form of curbs, berms, dikes, spill containment pallets, etc. need to be provided.

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**
    - ✦Local airport should know this
    - ✦Or Nat'l. Weather Service

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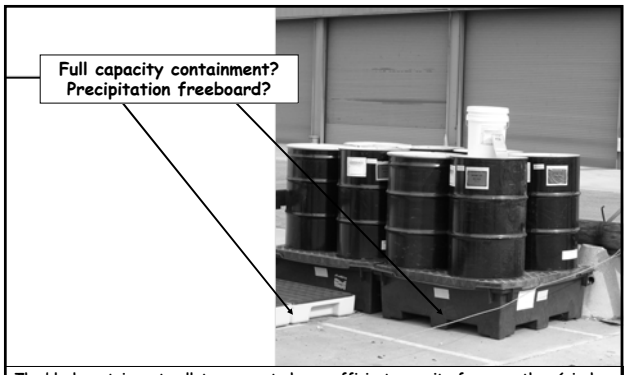
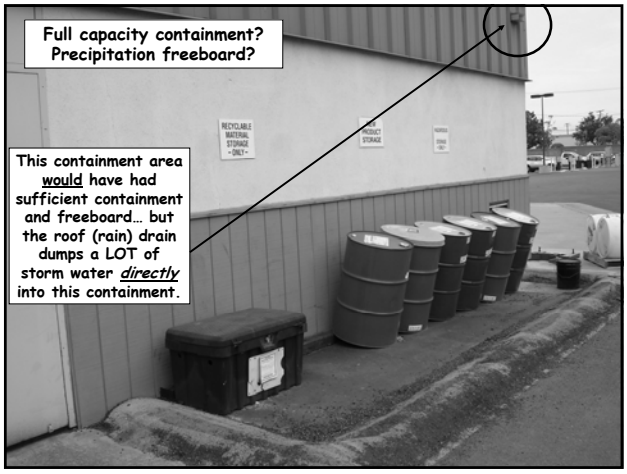
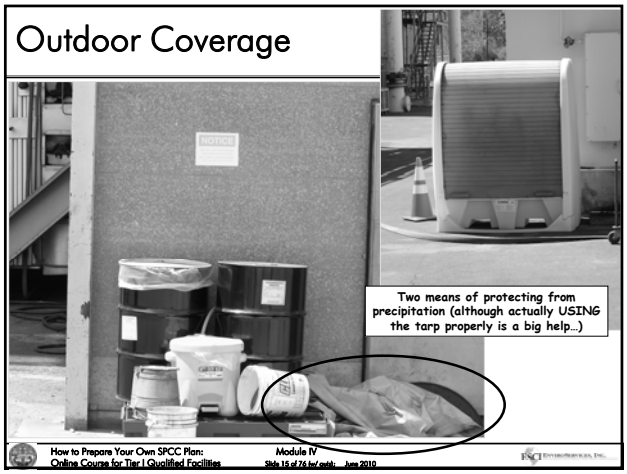


The black containment pallets appear to have sufficient capacity for more than 6 inches of rain (plus the 55 gallon drum capacity).

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.





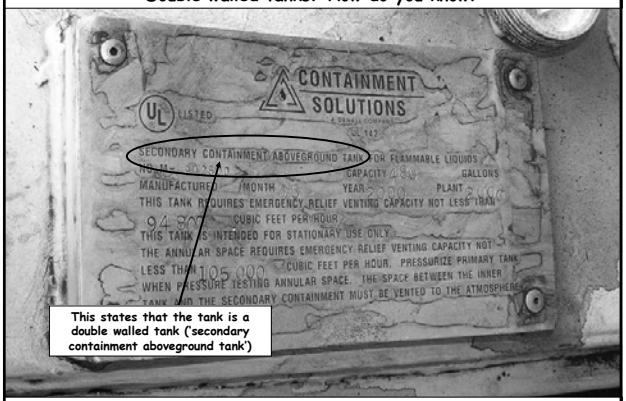
Double-Walled vs Single Walled Tanks

- **Double walled (and/or tanks with integral secondary containment)**
  - **Meets 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 you need to verify
  - **Additional curbing may be present but not required**

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

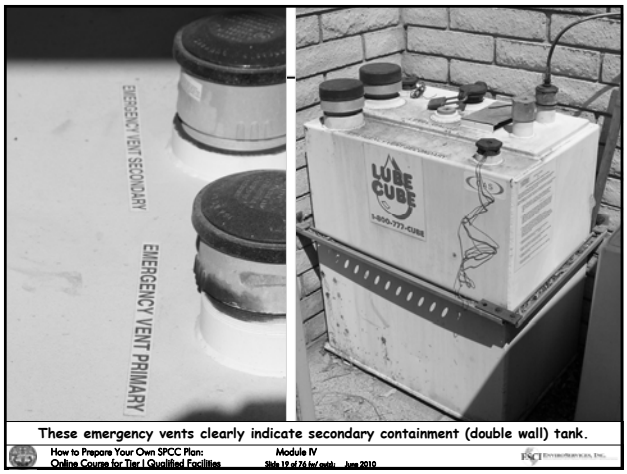
Double walled & integrally contained tanks do not need to account for precipitation freeboard, and inherently meet sized containment standard.

Double walled tanks? How do you know?



This states that the tank is a double walled tank ('secondary containment aboveground tank')

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



These emergency vents clearly indicate secondary containment (double wall) tank.

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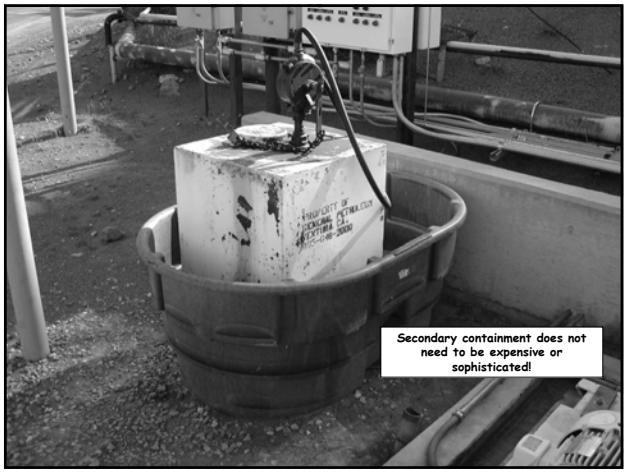
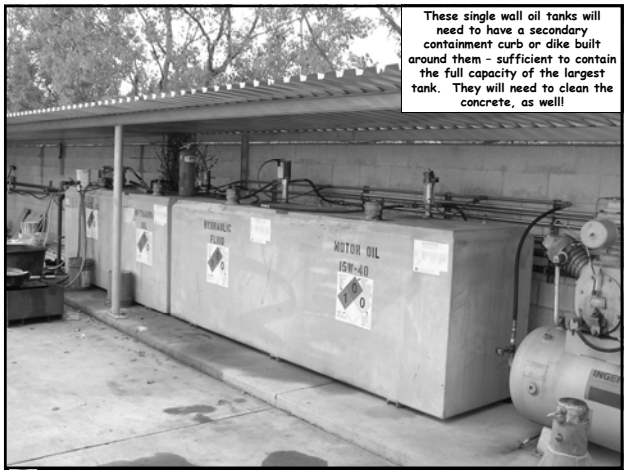
"Monitor Port" indicates the presence of an interstitial space (and therefore a double walled tank).

Day tanks for several emergency generators. Most newer ones are double walled… but the manufacturers plate should tell you. If single walled – they would need to have secondary containment curbing installed. These specific ones are double wall.





Sized containment/spill pallets for drums and IBCs (totes). Need to be careful that the spigots/drain valves do NOT hang over the edge of the containment.

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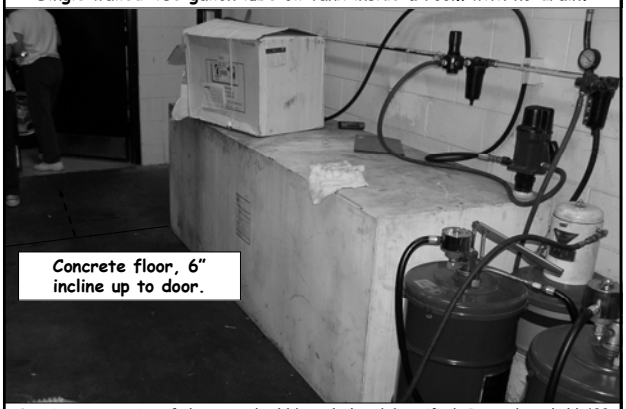
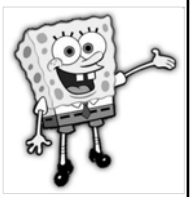
Single walled 480 gallon lube oil tank inside a room with no drain.



Containment capacity of the room should be calculated & verified. It needs to hold 480 gallons. Room is 10'w x 14'l x 0.5'h = 70 ft^3 x 7.48 gal/ft^3 = 524 gallons = OK!

Sufficiently Impervious

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



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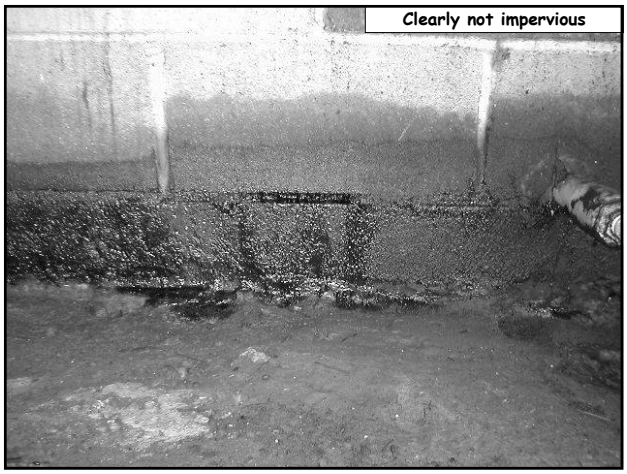

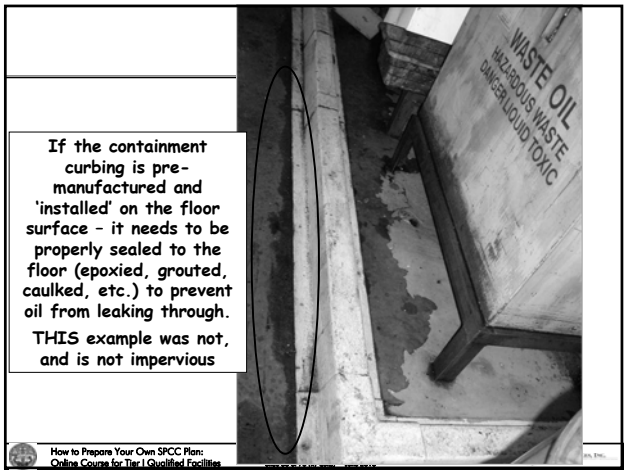

It WAS impervious…

This is a great example of just checking the boxes on the template vs. making sure you assure ongoing compliance by proper inspections and maintenance.

Generator Base Tanks: Single vs Double Walled?

- **Base fuel tanks on generator units (if at least 55 gal capacity) 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
    - ✦The older the generator – the more likely it is single wall

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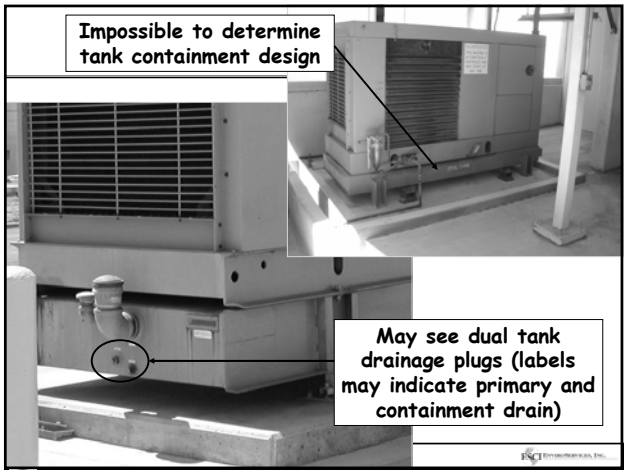
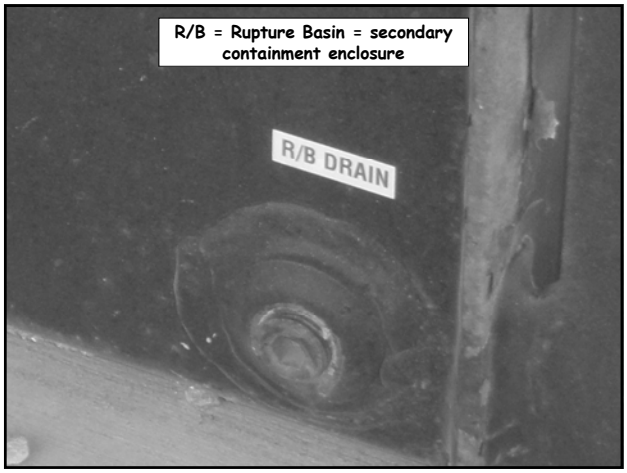
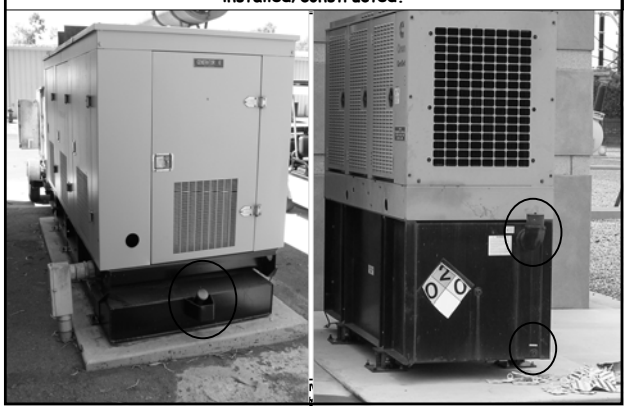




Fill port design & single base tank drain indicate a single walled base tank… these two would need to have sized containment installed/constructed.



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

- **We just reviewed "sized" containment for stationary and portable bulk storage containers & tanks**
  - **And if your bulk tanks & containers meet these requirements – you can check the containment compliance box in Table G-10 (Page 9)**
- **Next we'll review "general" containment for oil-filled equipment, oil/petroleum loading/unloading areas and transfer areas and non-transportation related tank trucks**
  - **And if your equipment, areas and trucks meet these requirements – you can check the containment compliance box in Table G-3 (Page 3)**

'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**
- **General oil/petroleum-handling areas of the tank facility and equipment include:**
  - **Handling and transfer areas (including piping connected to tanks, and facility areas over which oil drums are transported or temporarily staged)**
  - **Loading/unloading areas (e.g. fuel tank loading area)**
  - **Oil-filled manufacturing, operational & electrical equipment**

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

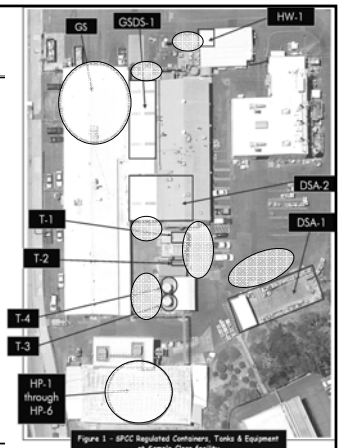
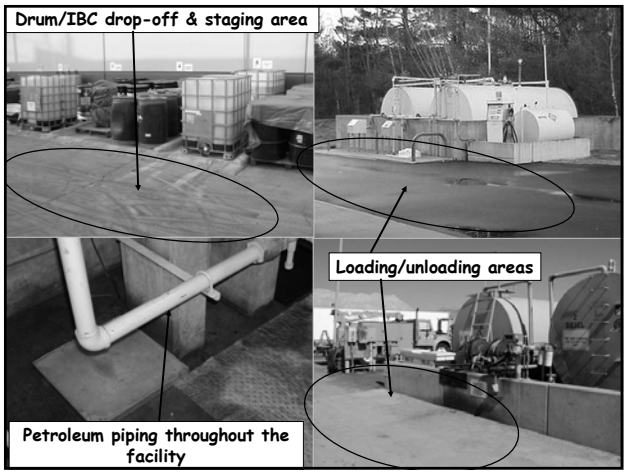


Figure 1 - SPCC Regulated Containers, Tanks & Equipment at Sample Class facility (see Table G-2)



General Containment or Diversionary Means
(40 CFR 112.6(a)(3)(i), 112.7(c) & Template Page 3, Table G-3

1. **To prevent a discharge in harmful quantities (an oil sheen) to navigable water**
2. **Must only address the typical failure mode and most likely quantity of oil that would be discharged**
3. **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**

General Containment Criteria
40 CFR 112.7(c)

1. **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**
     - Discharging into municipal storm water systems, creeks, rivers, ocean, ditch... including dry creeks/streams streams
   - **Is the public street curb a navigable water?**
     - Can easily be interpreted that way
       - **Because of storm drain proximity**

General Containment Criteria
40 CFR 112.7(c)

2. Must only address the typical failure mode and most likely quantity of oil that would be discharged (from each equipment or equipment type, area, activity, etc.)

- **Typical failure mode?**
  - **As determined/certified by the facility**
  - ✦ Based on experience & research (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'**

General Containment Criteria
40 CFR 112.7(c)

- **Most likely quantity that would be discharged?**
  - **As determined by the facility**
  - ✦ Based on experience &/or 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...**
      - This will need to be demonstrated during the CUPA inspection
- **Spill predictions (Table G-4... coming up, along with examples)**
  - ✦ Plans must list / describe the various failure scenarios and spill volumes & direction

General Containment Criteria
40 CFR 112.7(c)

3. Entire containment 'system' including walls and floor must be

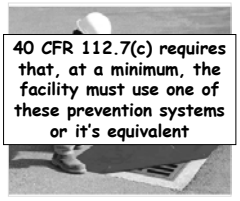
- **Capable of containing oil**
- **Constructed so that any discharge from primary containment will not escape before clean-up occurs**

'System' could include:

- **Traditional curbs and asphalt or concrete base**
- **Gravel beds and soil base**
- **Spill pads and sorbent socks**
- **Storm drain covers or closure systems**
- **Collection sumps**
- **Door thresholds and flooring**
- **Oil-water separators, etc.**

Methods of Secondary Containment Listed in 40 CFR 112.7(c)

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

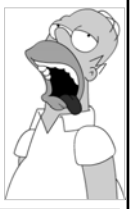


40 CFR 112.7(c) requires that, at a minimum, the facility must use one of these prevention systems or it's equivalent

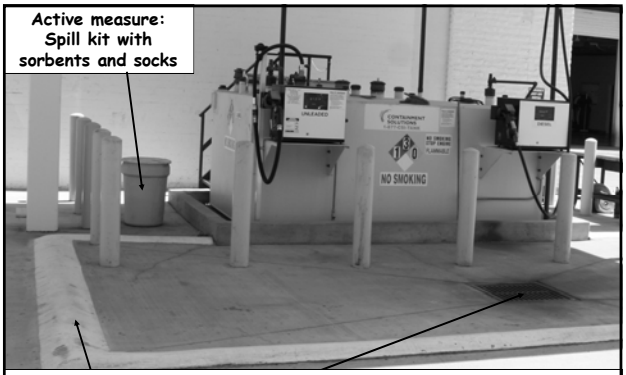
- Spill diversion ponds
- Retention ponds
- Sorbent materials
- Sumps and collection systems

Passive vs. Active Containment Measures

- Allowed to use active and/or passive <u>general</u> containment measures to prevent a discharge
  - Passive measures are viewed by US EPA as being more reliable (and 'necessary' for sized containment)
  - Selection is up to facility owner/operator
    - ✦Routine facility inspections should verify presence & implementation (as will CUPA inspections)
      - E.g. well stocked and located spill kits, trained and aware employees, well managed sorbent pads and trays, etc.



- <u>Passive</u> measures: Permanent installations and do not require deployment or action by facility or vendor personnel
- <u>Active</u> containment measures: Those that do require deployment or other specific action by facility or vendor personnel



Small curbed area and 'dead' sump in front of double walled tank has ~300 gallon capacity. This is passive general containment for fuel loading and unloading activities.
For these type of sumps, check with the CUPA first on requirements for 'exempt emergency containment (underground) tanks'.

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 a petroleum transfer activity**
  - **Covering the storm drain in reaction 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**

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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.

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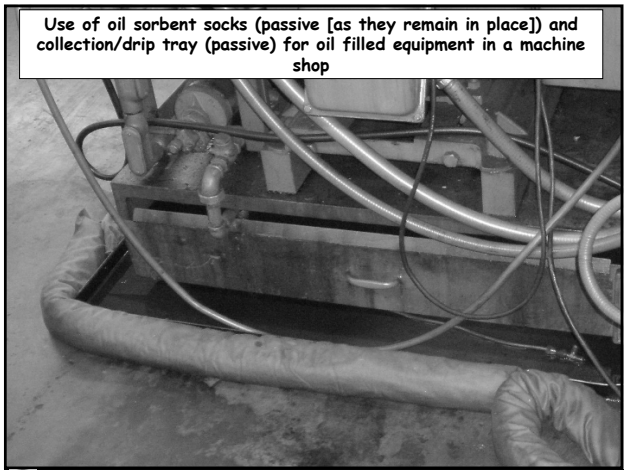
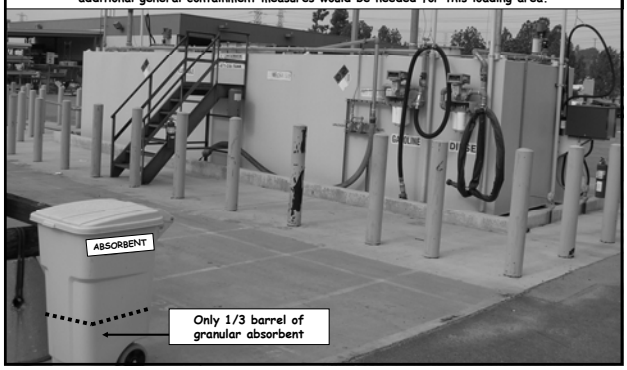
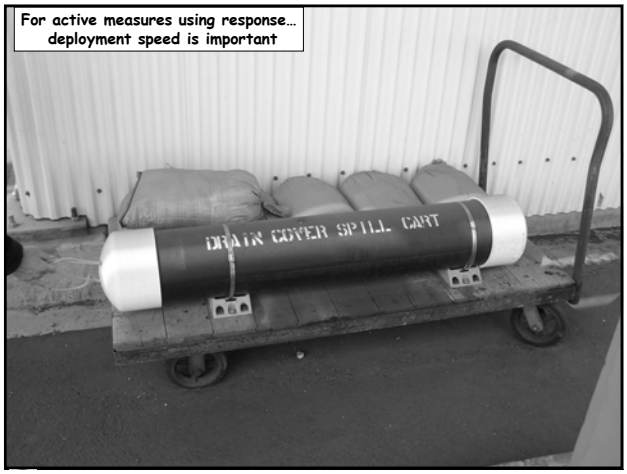
Use of oil sorbent socks (passive [as they remain in place]) and collection/drip tray (passive) for oil filled equipment in a machine shop

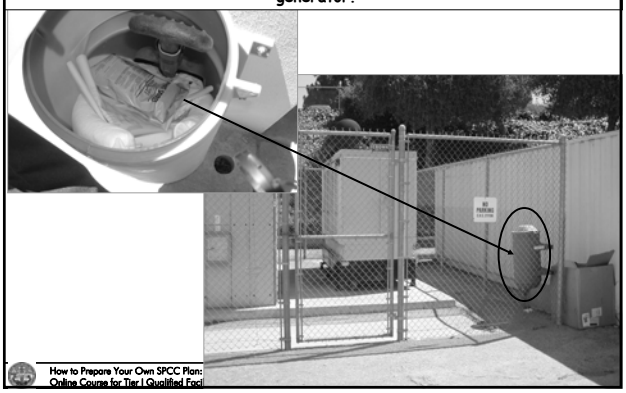


Spill supplies (granular absorbent) staged at the tank loading/unloading area.
Plan states typical failure mode, volume and rate is loading hose rupture with 60 gallons released (30 seconds to respond & shut off flow at 120 gpm pump rate).
Flow direction is down-gradient toward a storm drain to the left.
Common sense should tell you that the 1/3 barrel of absorbent is not sufficient to keep the 60 gallons from reaching the drain (nor is it positioned properly to protect the drain. For this facility – additional general containment measures would be needed for this loading area.



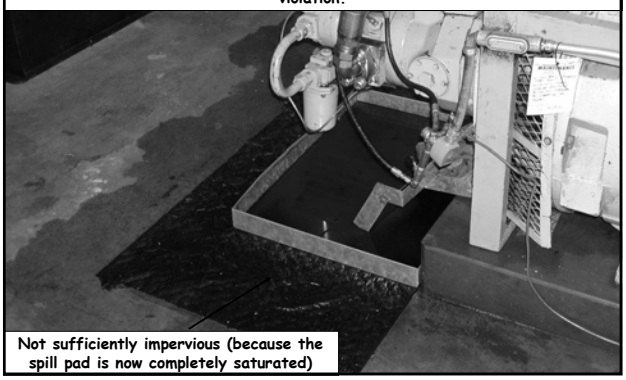


This facility uses (properly located and well stocked/maintained) spill kits and active response during generator tank filling operations as the general containment for the double wall base tank loading area in front of the generator.



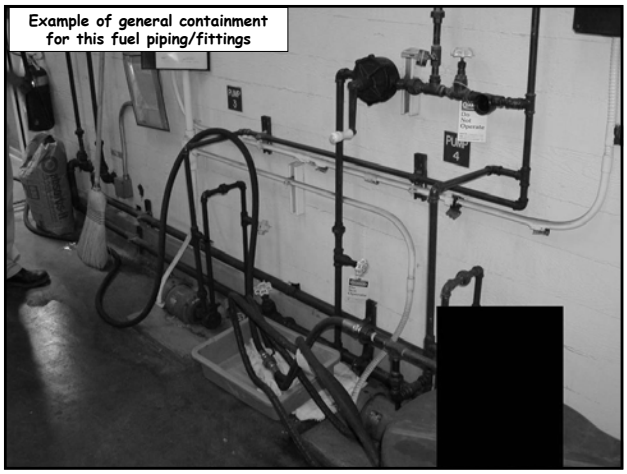
Example of general containment. This facility uses spill trays and sorbent pads for general containment for the most likely release from the oil filled equipment… But if these measures are not being maintained properly – the Plan is not being implemented as required, and the facility could receive a notice of violation.

Like the previous facility, this facility also uses spill trays and sorbent pads for general containment for the most likely release from the oil filled equipment… But if these measures are not being maintained properly – the Plan is not being implemented as required, and the facility could receive a notice of violation.



Not sufficiently impervious (because the spill pad is now completely saturated)

Example of general containment for this fuel piping/fittings



Non-transportation related tank trucks (on-site mobile refueler) = general containment for most likely spill. Note the curbing… sufficient for the typical failure mode (a minor valve, fitting or nozzle leak).

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Review: Page 3, Table G-3 Secondary Containment and Oil Spill Control Detail

2. **Secondary Containment and Oil Spill Control (§§112.6(a)(3)(i) and (ii), 112.7(c) and 112.9(c)(2)):**

Table G-3 Secondary Containment and Oil Spill Control	
Appropriate secondary containment and/or diversionary structures or equipment[a] is provided for all oil handling containers, equipment, and transfer areas to prevent a discharge to navigable waters or adjoining shorelines. The entire secondary containment system, including walls and floor, is capable of containing oil and is constructed so that any discharge from a primary containment system, such as a tank or pipe, will not escape the containment system before cleanup occurs.	☐

[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.

- **Now that you understand what the containment requirements are… you can verify & assure that your facility meets these and can check the compliance affirmation check box**
  - **'General' containment: THIS Table G-3**
  - **'Sized' containment: Table G-10 in Section A (page 9)**

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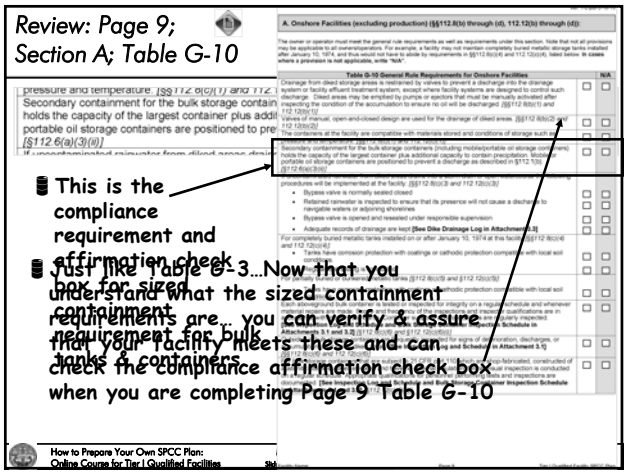
Review: Page 9; Section A; Table G-10

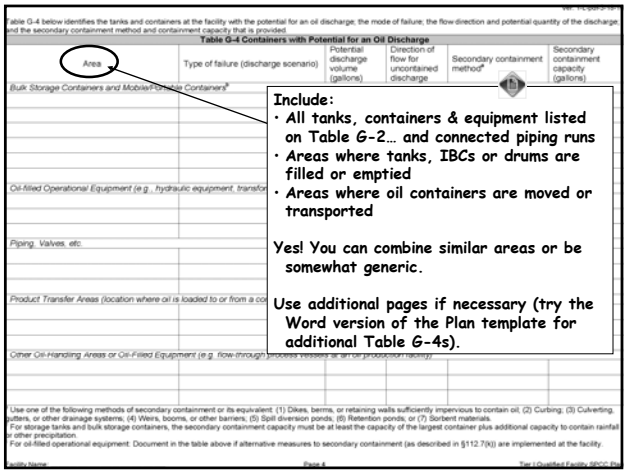


- This is the compliance requirement and affirmation check box for sized containment requirement for bulk tanks & containers
- Just like Table G-3…Now that you understand what the sized containment requirements are… you can verify & assure that your facility meets these and can check the compliance affirmation check box when you are completing Page 9 Table G-10

Page 4

- **G-4: Spill prediction**
  - **i.e. 'Containers with the potential for oil discharge'**
  - **Must list:**
    - Bulk tanks & containers
    - Oil filled equipment
    - Piping & valves
    - Product transfer & loading/unloading areas
    - Overall oil handling areas

Completed sample in a minute… This Table G-4 is one of the more complicated/time consuming elements of the Template



Include:
- **All tanks, containers & equipment 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).

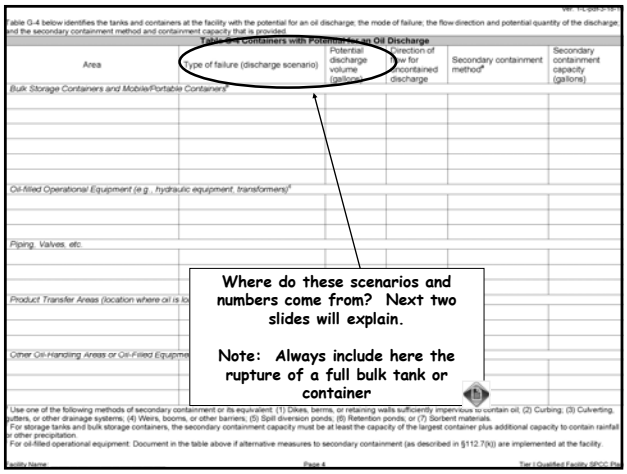


Table G-4 below identifies the tanks and containers at the facility with the potential for an oil discharge, the mode of failure, the flow direction and potential quantity of the discharge, and the secondary containment method and containment capacity that is provided.

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	Secondary containment capacity (gallons)
Bulk Storage Containers and Mobile/Portable Containers					
Oil-filled Operational Equipment (e.g., hydraulic equipment, transformers)					
Piping, Valves, etc.					
Product Transfer Areas (location where oil is lo					
Other Oil-Handling Areas or Oil-Filled Equipme					

Where do these scenarios and numbers come from? Next two slides will explain.

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

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.
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.
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

Failure Modes Based on General Experience

- **Typical failure mode/scenario?**
  - Common modes/scenarios:
    - **Overfills**
    - **Loading or unloading hose ruptures**
    - **Piping connection leaks/weeps**
    - **Hose connection failures**
    - **Weeps/leaks from fittings or gaskets**
    - **Weeps/leaks from small structural defects or damage**
    - **Portable tank/drum tip over during movement**
    - **Puncturing IBCs with a forklift**

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Potential Discharge Volume?

- **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**

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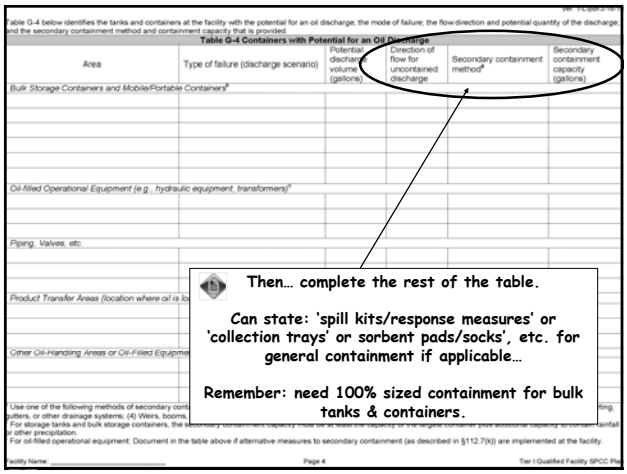

Table G-4 below identifies the tanks and containers at the facility with the potential for an oil discharge; the mode of failure; the flow direction and potential quantity of the discharge; and the secondary containment method and containment capacity that is provided.

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[4]	Secondary containment capacity (gallons)
Bulk Storage Containers and Mobile/Portable Containers[3]					
Oil-filled Operational Equipment (e.g., hydraulic equipment, transformers)[5]					
Piping, Valves, etc.					
Product Transfer Areas (location where oil is lo					
Other Oil-Handling Areas or Oil-Filled Equipme					

Use one of the following methods of secondary cont... tting, gutters, or other drainage systems; (4) Weirs, booms, ...
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.
For oil-filled operational equipment: Document in the table above if alternative measures to secondary containment (as described in §112.7(k)) are implemented at the facility.

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

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[4]	Secondary containment capacity (gallons)
Bulk Storage Containers and Mobile/Portable Containers[3]					
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)[5]					
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 ar...					

Sample for Class

Available for download on the DEH website

Page 4 ...Qualified Facility SPCC Pla...

Spill Prediction (another example)

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