Overfill Prevention For Aboveground Storage Containers - W-G1

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Overview

1) Overfill requirements by SPCC plan type

   Tier I vs Tier II vs. PE Plan

2) CFR 112.8(c)(8) overfill requirements

3) Case studies

Overfill Options - By SPCC Plan Type

Tier I Qualified Plan

112.6(a)(3)(iii): Overfill prevention, **in lieu of the requirements in 112.8(c)(8)** and 112.12(c)(8)

- Ensure that each container is provided with a **system or documented procedure** to prevent overfills of the container, describe the system or procedure in the SPCC Plan and **regularly test** to ensure proper operation or efficacy

Tier II Qualified Plan

No deviations allowed from 112.8(c)(8) unless deviations are certified by a PE as environmentally equivalent

PE Plan

No deviations allowed from 112.8(c)(8) unless deviations are certified by a PE as environmentally equivalent

Overfill Options per CFR 112.8(c)(8)

Engineer or update each container installation in accordance with good engineering practice to avoid discharges. You must provide **at least one** of the following **devices**:

Few notes before we start:

(1) In reality, there are three devices and one procedure

(2) "At least one", i.e., sometimes you need more than one option to have sufficient overfill prevention!

Overfill Options per CFR 112.8(c)(8)

Option #1 - Device

CFR 112.8(c)(8)(i) - High liquid level alarms with an audible **or** visual signal at a constantly attended operation or surveillance station. In smaller facilities an audible air vent may suffice.

Audible to who?

Visual to who?

Overfill Options per CFR 112.8(c)(8)

Option #2 - Device

CFR 112.8(c)(8)(ii) - High liquid level pump cutoff devices set to stop flow at a predetermined container content level.

Overfill Options per CFR 112.8(c)(8)

Option #4 - Device

CFR 112.8(c)(8)(iv) - A fast response system for determining the liquid level…..such as digital computers, telepulse, or direct vision gauges

If you use this alternative, a person must be present to monitor gauges and overall filling

Which person must be present?

Overfill Options per CFR 112.8(c)(8)

Option #3 – Procedure

CFR 112.8(c)(8)(iii) - Direct audible or code signal communication between the **container gauger** and the **pumping station**

What does this mean?

- Interaction between two entities (or persons) - "gauger" and "pumper"
- Despite the language used, this option is not just for large facilities fed by pipeline!
- There are **two reasons** why you may see this at your everyday APSA site

CFR 112.8(c)(8)(iii) - Procedure

Reason #1: Procedure is sufficient in lieu of a device

112.8(c)(8): **"at least one** of the following"… **includes (c)(8)(iii)!**

What are we talking about here?

- 55-gallon drums
- 275-gallon totes
- Small tanks, liquid level visible by sight while filling

These are not exempt from 112.8(c)(8) at a Tier II or PE Plan facility

What are they using? Gauger/pumper procedure

CFR 112.8(c)(8)(iii) - Procedure

Reason #1: Procedure is sufficient in lieu of a device

Are we really talking about a two-person procedure for filling drums?

Don't be silly!

Guidance does not define "Gauger and pumper"

- Could be one person
- Think of "gauger" and "pumper" as roles

CFR 112.8(c)(8)(iii) - Procedure

Reason #1: Procedure is sufficient in lieu of a device

Justification?

Section 3.3.3 of the Federal SPCC Guidance states:

"While an audible/visual alarm or fast-response system may be appropriate for a large, stationary storage tank, a simpler overfill prevention **procedure** may be appropriate for a small container (e.g., relatively small containers that can be **readily monitored**) when the filling procedure is documented in the SPCC Plan."

"A **procedure for smaller containers** that ensures communication between the container **gauger** and the **pumper** is in accordance with §§112.8(c)(8)(iii)…"

Overfill Options per CFR 112.8(c)(8)

Reason #1: Procedure is sufficient in lieu of a device

What about larger tanks? Guidance says, "smaller containers", but sizing is not defined

"The development of this procedure should consider factors such as…"

1) Ability of **the person** filling to **continuously monitor** product level in the container
   - Arguably the most important qualifier for using a procedure in lieu of a device

2) Filling rate, container size, reaction time

In case you whoops…

3) Capacity of the secondary containment and/or catchment basin
   - I would add, there is a big difference between a DW tank vs. SW tank in containment

4) Proximity to floor drains, sumps, and other means through which oil could escape

CFR 112.8(c)(8)(iii) - Procedure

Reason #1: Procedure sufficient in lieu of a device

To recap, a procedure could work in lieu of a device if:

- Liquid level is easily visible/readable in real time while filling
- Cannot or chose not to install an overfill device
- Procedure is easily practical and effective

CFR 112.8(c)(8)(iii) - Procedure

Reason #2: Overfill device alone is insufficient

Example:

A gauge is installed serving as a fast response system, but the tank is remotely filled, and the delivery driver cannot see the gauge during filling

- Gauge alone is insufficient
- The SPCC plan could additionally outline a procedure for communication between the delivery driver (pumper) and a gauger (facility employee)

Overfill Options per CFR 112.8(c)(8)

Section 3.3.3 of Federal SPCC Guidance states:

Example filling procedure:

- Verifying that the container has sufficient free capacity (ullage)
  - Sticking tank, using tank chart to **convert inches of ullage to available gallons**
- **Visually monitoring the product level throughout the transfer operation**
  - Gauger directly views liquid level, communicates to pumper (procedure in lieu of device)
  - Gauger views gauge, communicates to pumper (device + procedure)
- Post fill procedures next to the container/fill pipe
  - Considering that some containers (drums, totes, small tanks, etc.) likely don't need a posted procedure

Overfill Options per CFR 112.8(c)(8)

Final Thoughts on Gauger/Pumper Procedure

Gauger/pumper communication and procedures must be adequately described in the SPCC plan

Personnel should be able to demonstrate an understanding of the procedures and proper field implementation

Tier I Procedure (112.6) vs. Tier II/PE Plan Procedure (112.8(c)(8))

What's the difference between these two procedural options?

112.8(c)(8) procedure requires:

- **Real-time** liquid level monitoring
- Procedure is written/approved by a Professional Engineer

Tier I facility still responsible for an effective overfill prevention procedure, but nothing in code or guidance requires real-time liquid level monitoring

Overfill Options Based on SPCC Plan Type

- Tier I Qualified Plan

  Example Procedure - No device installed

Table G-10 General Rule Requirements for Onshore Facilities		N/A
Each container is provided with a system or documented procedure to prevent overfills for the container. Describe: 3,000 gallon Diesel AST: The delivery driver gauges the tank to determine the current volume using the manufacturer tank chart, and calculates the amount needed to be delivered to remain below 95% tank capacity. The delivery driver then transfers product into the tank under constant supervision, monitoring his delivery while fueling. After delivery, the delivery driver gauges the tank again to confirm final volume remains below 95% tank capacity. 55 gallon drums: Drums are filled with a stinger from delivery truck. Filling is constantly attended, and delivery person maintains visibility with liquid level in drum at all times during filling.	☑	☐

Problems with Overfill Compliance (Scenarios)

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Split Gasoline/Diesel Fueling AST

Split Gasoline/Diesel Fueling AST

Situation: Gasoline fueling must comply with Enhanced Vapor Recovery (EVR)
Issue: Inventory gauge device (option #4) gets bumped in favor of EVR
Violation: Lack of overfill prevention on gasoline tank

Split Gasoline/Diesel Fueling AST

Return to Compliance? – Tier II or PE Plan Facility

Alarm and/or inventory gauge are not possible – no where to go

Install an overfill shutoff device – best option

Gauger/pumper procedure? - **Unlikely, inconsistent with federal guidance**

- Issues: Unable to monitor liquid level in real-time, size of container, rate of filling, reaction time, release containment

Split Gasoline/Diesel Fueling AST

Return to Compliance? – Tier I Facility

May self certify a written procedure in lieu of CFR 112.8(c)(8)

- What would that look like?
  - Gauge tank, calculate ullage with tank chart in gallons, monitor delivery, check final inventory afterwards….

Split Gasoline AST Vent/Overfill Combination

Caution

This is not an endorsement of this option!

EH CUPAs do not have the authority to approve CFC

CFC 5704.2.7.3.1 Vent lines. Vent lines from tanks shall not be used for purposes other than venting **unless approved**

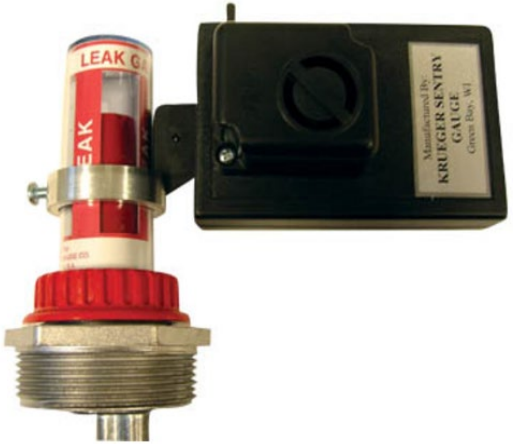
- Leaves the door open for local fire approval
- Consider safety issues with vent restrictions

Check with your local fire authority

Split Gasoline/Diesel Fueling AST

Anything wrong with diesel overfill?

Split Gasoline/Diesel Fueling AST



Situation: SPCC plan states the diesel tank has an audible alarm
Issue: This is not a gauge but rather an audible alarm missing the alarm box
Violation: Overfill alarm specified in SPCC plan is inoperable

Wireless Tank Monitors

Situation:
SPCC plan states split AST has inventory gauges for overfill prevention (fast response system)

Issue:
The fuel vendor removed the inventory gauges and installed wireless remote tank monitors

Typically, this will ping the fuel provider twice a day, letting them know when a delivery is needed

Does not provide real time monitoring to meet the fast response system requirement

- **Unless** tablet/app reader is present with delivery driver

Wireless Tank Monitors

Return to Compliance? Tier II & PE Plan Facility
Install an overfill shutoff device

Restore a fast response system by:

1. Use of a real time tablet/app reader by delivery driver while fueling
   - Must verify capability and continued compliance with use

or

2. Remove wireless monitors and reinstall the original liquid level gauges

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Wireless Tank Monitors

Return to Compliance? Tier I Facility

May self certify a written procedure in lieu of a device in 112.8

What would that look like?

- Gauge tank, calculate ullage with tank chart in gallons, monitor delivery, check final inventory afterwards….

Veeder Root Monitoring Panel Inside Facility

Situation: SPCC plan states tank has an overfill Alarm using the Veeder Root monitoring panel inside the office

Issue:
Delivery driver at the tank outside does not receive the audible or visual signal

Therefore, the audible/visual alarm alone is not compliant

Veeder Root Monitoring Panel Inside Facility

Return to Compliance? Tier II & PE Plan Facility

Install an external audible or visual alarm at tank →

Install an overfill shutoff device

Add supplemental gauger/pumper procedure **– unlikely**

- Facility employee views liquid level in real time on Veeder Root screen, communicates to driver

Tier I: May self certify a written procedure in lieu of a device in 112.8

Waste Oil Tank Filled Remotely via Pump

Situation:

SPCC plan states that the used oil AST has a liquid level gauge that is monitored during filling (fast response system)

Issue:

Tank is remotely filled from the mechanic shop via a pump, therefore, tank does not comply with fast response system

"….a person must be present to monitor gauges and overall filling"

Waste Oil Tank Filled Remotely via Pump

Situation Develops Further:

Upon inspection, the used oil AST has an audible alarm

Issues:

Audible alarm is clearly inoperable.

Site continues to fill the used oil sink despite not having anywhere for oil to go.

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Waste Oil Tank Filled Remotely via Pump

Violations:

- SPCC plan inaccurate
- Lack of functioning overfill
- Visible discharges not promptly corrected
- Failure to regularly test overfill devices

And LQG hazardous waste tank!

- Accumulation time limit exceeded
- Failure to perform daily tank inspections
- Overfill inoperable
- Not operating in a manner to prevent release of hazardous waste

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Waste Oil Tank Filled by Directly Connected Pump

Situation

SPCC plan states that the facility visibly monitors the liquid level in the waste oil tank during filling (gauger/pumper procedure)

Issue

Due to the direct pumping connection, ability to view the liquid level in real time is lost.

Therefore, this tank does not comply with the gauger/pumper option.

Waste Oil Tank Filled by Directly Connected Pump

Return to Compliance? - Tier II & PE Plan Facility

Install an overfill shutoff device **– Unlikely**

Install an audible alarm or liquid level gauge

Both require tank modification

Restore gauger/pumper procedure by:

- Disconnecting pump/hose and hand pouring with sight of liquid

Consider viability

Waste Oil Tank Filled by Directly Connected Pump

Return to Compliance? - Tier I Plan Facility
Realtime liquid monitoring isn't required in procedure, so maybe the hose/pump could stay?

<u>But…</u>

- Is the procedure feasible?
- How are they sticking the tank?
  - Do they remove the vent cap each time?
  - Ask to see their gauging stick!
- Are they knowledgeable about the procedure?
- Is it properly implemented?

Extra Credit
Alarms…Are They Connected?

Pressing the test button on the audible alarm box is not a functionality test!

The test button only tells you that the battery is working, and the buzzer sounds

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Any Questions?

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