April 2025

Environmental, Safety & Security
Sequential Safety Meeting

MARATHON

ANACORTES REFINERY

ESS Safety Metrics

DSA Eligible	OSHA rec	ORIR	AFPM 1a/1p	H2S >50 ppm	PSE 1/2	DEI 3/4	Permit deviations
✖	1	0.28	0/2	2	0/0	0/0	8
🎯	-	*0.30*	3	≤ 3	≤ 3	≤ 1	*34*

AFPM 1a: <u>Actual Incident</u> - serious injury that caused a fatality, hospitalization, or other life-altering event.

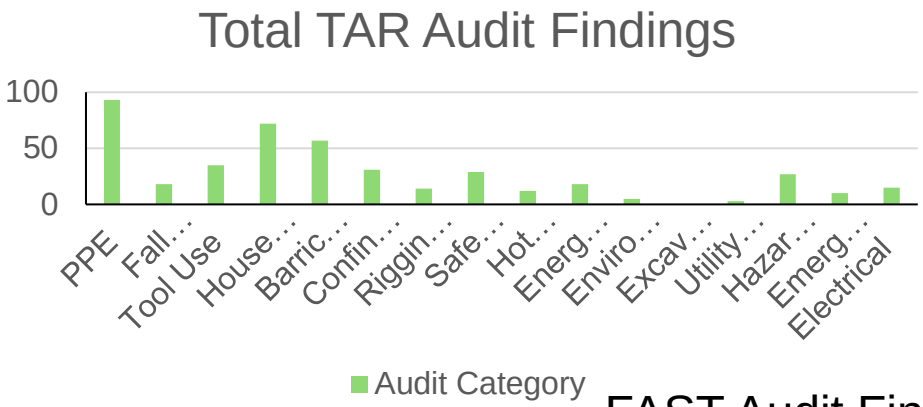
AFPM 1p: <u>Potential Incident</u> - an incident with the potential for fatality, hospitalization, or other life-altering event, including near misses.

ORIR: OSHA Recordable Injury Rate = (number of recordables/(contractor + employee hours worked))

PSE: Process Safety Event, refer to R-12-007
DEI: Designated Environmental Incident, refer to R-13-027

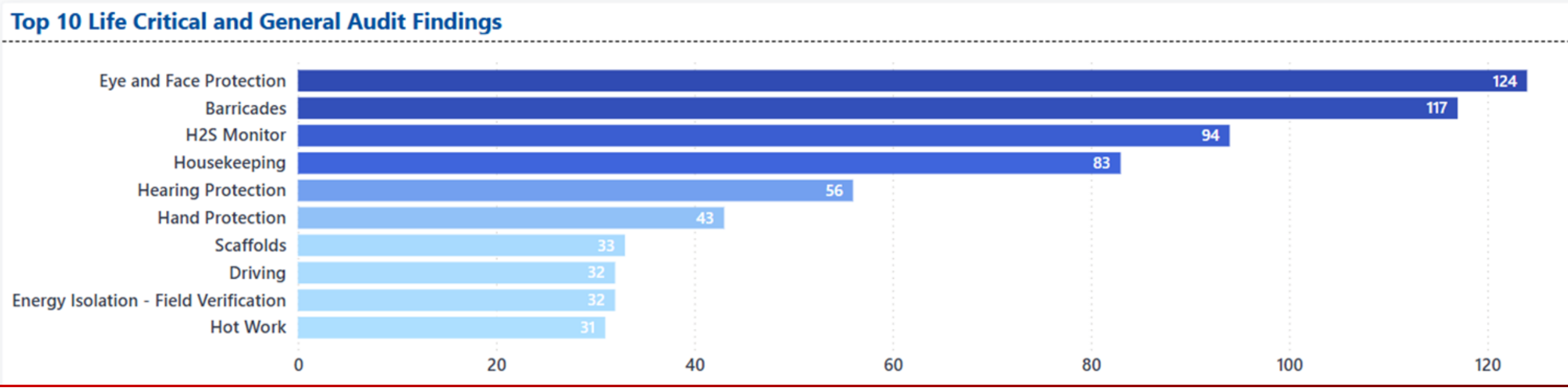
1p - Safety Incident Fall Hazard
1p - HVAC Electrical Spark

Start Safe and Stay Safe:



- Between the TAR audits and FAST audits, what similarities do you see?
- What areas do we need to improve on?

FAST Audit Findings (March 14th – April 8th)



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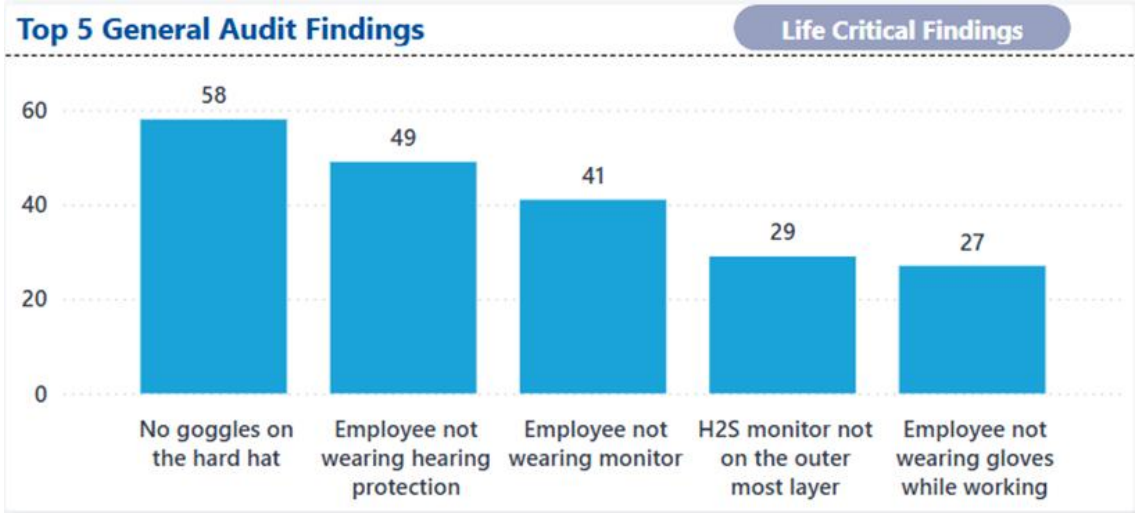
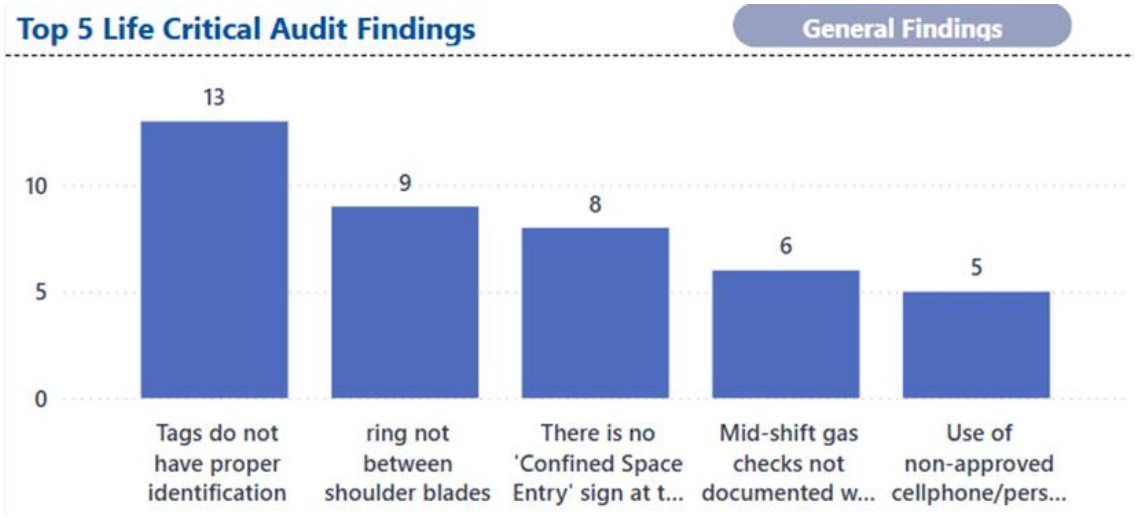




- TAR and FAST audits are different systems, yet they show similar trends.

- Top 3 areas for **Improvement**

- PPE Compliance
- Housekeeping
- Barricades

Start Safe and Stay Safe:

Engagement Questions:

- What are 3 ways that you can help with PPE compliance?
- What does “Good” housekeeping look like to you?
- When a barricade is set up, what should be affixed to the flagging?
- When should **RED** barricade be used?

Permit Deviations: 8
Tier 1 / 2 DEIs: 11
Tier 3 / 4 DEIs: 0

Environmental POI: FE Tag Redbox

What to do?
When an LDAR valve is replaced, the yellow tag must be removed from the existing valve and placed in the FE Tag Redbox in the field ops centers. Please do not put the tag on the new valve.

Why?
All new valves are required to be monitored within 30 days of installation. When tags are found in the Redbox, this signals to Environmental that a valve has been replaced and will need an LDAR inspection. This is especially important for replacement in kind valves that are not tracked in an MOC.

Who is responsible?
The person who removes the old valve and tag is responsible for placing the FE tag in the Redbox. This could be maintenance, operations, or contract personnel.

Example of LDAR tag:

PSE1 MPC POST EVENT LEARNING REPORT

ANACORTES JET FUEL TREATER BLOWDOWN LEFT OPEN INC# 409292

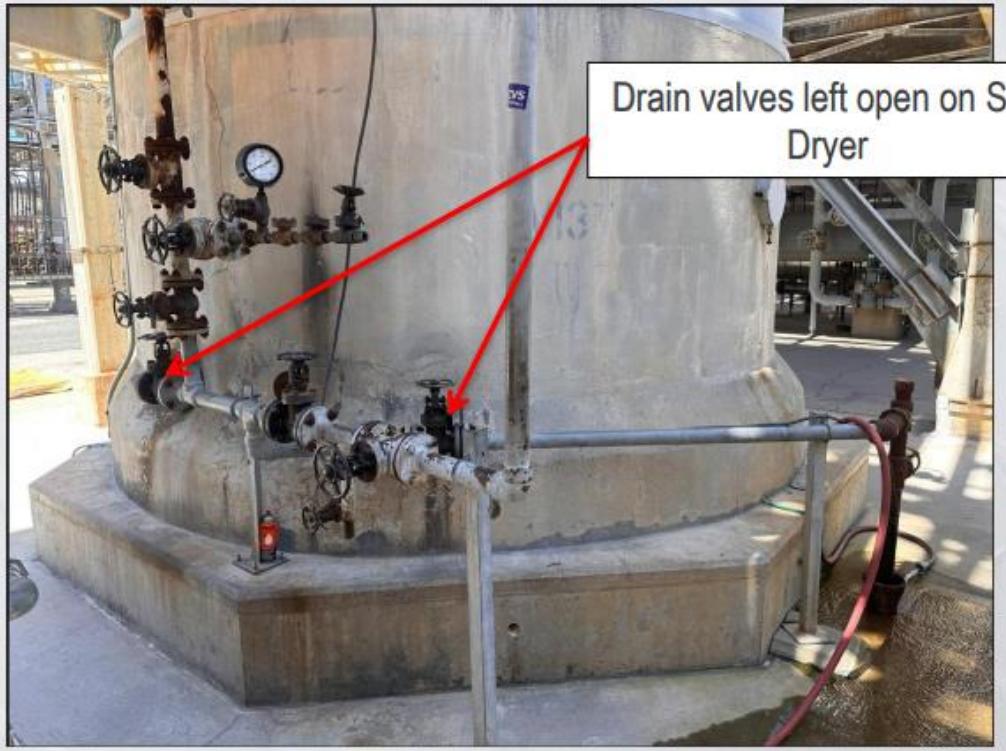
Published 3/14/2025

On December 13, 2023, at approximately 7:25 a.m., a board Operator noticed a discrepancy between the liquid flow into and out of the Jet Fuel Treater. The board Operator asked the outside Operator to investigate. The outside operator found the salt dryer blowdown open to the Oily Water Sewer system. The blowdown was closed, and the board Operator was notified of the findings. Jet Fuel product drained to Oily Water Sewer system at a rate of 66.84 bbl/hr over 3.67 hours, with a total of 245 barrels released.

- **This incident was categorized as a PSE 1 due to calculated leak rate above Tier 1 threshold quantity for Cat 7 fluid.**

Causal Factors:

- The Jet Fuel Treater Salt Dryer, V-137, drain valves were left open and unattended.
- It had become normalized to leave blowdown valves open for efficiency for some Operators.



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"THE REST OF THE STORY":

In the past three years across Refining, there have been 13 valve left open incidents resulting in a PSE 1 or PSE 2, with 6 specifically associated with draining. The recurrence of this issue suggests that the practice of leaving valves left open or drain valves unattended has not been completely resolved from previous investigation actions and that further understanding about blowdowns across the refineries is needed to improve these processes.

For most draining activities throughout Anacortes, Operations personnel are the only layer of protection for preventing a similar incident. The motivation for leaving a blow down open discussed by interviewees was time pressure, efficiency, or the belief that the individual would never accidentally leave one open and unattended. The Operator's routine was to complete other blowdowns while salt dryer is draining and return later, but this routine was disrupted. A HOP Learning Team was initiated related to manual blowdowns to discuss how to improve this process. The learning team document can be accessed here.

DISCUSSION TOPICS:

- Review: Catlettsburg Sewer Explosion in 2010 (PSA 11-04), Garyville Caustic Release (PSA 11-11), Detroit Polyphosphoric Acid Release (PSA 18-01), (Garyville Alky Fire (PSA 23-03), and the BP Husky Toledo Fire.
- Has the practice of leaving open drain valves unattended temporarily become normalized for some Operations personnel? Have similar events happened at your facility in the past?
- Does your site have another layer of protection against leaving a valve open and unattended (ex: flow discrepancy alarm, visual alert in field, dead man valve)? What safeguards can be put in place?
- Why would someone leave a blowdown unattended? What is the worst thing that could happen from a blowdown left open and unattended?
- Are there engineering solutions available for manual blowdowns?

Operations

- What are your sites practices for reporting/notifying other units of draining activities?
- The risk/hazard of draining hydrocarbons to the oily water sewer may not be fully understood. Consider the downstream impacts.
- Water seals and sealed sewer covers may not sufficiently control flammable vapors if excess hydrocarbon is drained to these systems. There have been several incidents of hot sewers.
- Review Walk the Line toolbox talk on Open Ended Lines/Valve Left Open (link)

Topic: Walk the Line *Open Ended Lines or Valves Left Open*	**Target Audience:** Operators and Shift Supervisors

Purpose: To raise awareness of open-ended lines (OEL) or valves left open. Marathon reported 25 events in 2023 and 14 events so far in 2024 of OEL or valve left open. A list of some of these incidents that have led to Major Process Safety Events (PSE 1's or 2's) in 2021 – 2023 can be found on page two of this document.

As a general practice, bleeder / drain / vent valves that are opened to the atmosphere should be closed and plugged/capped unless they are being attended by operations personnel or are being utilized to support maintenance activities. Sometimes valves are intentionally left open to the atmosphere while unattended as a part of normal operating activities. Some reasons for this include:

- Venting of air during startup operations
- Draining of steam condensate while warming equipment with steam
- Verifying that equipment remains free of energy during maintenance activities

Identifying, closing, and plugging/capping of these valves at the correct time in the sequence of the applicable operating procedure is important in preventing loss of primary containment (LOPC).

Walk the Line Best Practices

Site policies/procedures are developed from corporate standards (RSP's/RRD's) that provide best practices for managing work associated with opening/closing valves and ensuring equipment is returned to a safe condition by verifying valves are closed and lines are plugged/capped.

The following are standards that will ensure equipment is returned to a safe state:

- *RSP 1121-010 Blinding and Energy Isolation* – Provides the requirements for ensuring valves that have been open/closed for LOTO's are being tracked on isolation sheets that will be referenced when

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HIGH VALUE LEARNING EVENT (HVLE)

MPC Refinery Flange Leaks: Flanged Assembly Failure due to Insulation

PSA 25-03 **Published 3/20/2025**

Summary

This HVLE is for awareness of the safety concern of insulating flanges.

Refining has experienced pipe flange leaks and valve bonnet flange leaks at multiple sites due to covering the flanges and bolting with permanent insulation or removable insulation covers when the process or utility stream operates above 400˚F. Robinson's 2023 incident led to lost opportunity of over $7 MM.

Flange & Bolting Details

Flanges and bolting should not be insulated in services that operate over 400˚F. Insulation on these flanges can increase the temperature of the bolting, which can allow the bolting to loosen slightly, resulting in a flange leak.

The intent of this HVLE is for awareness moving forward and not to retroactively review existing insulated flanges or remove existing insulation on flanges.

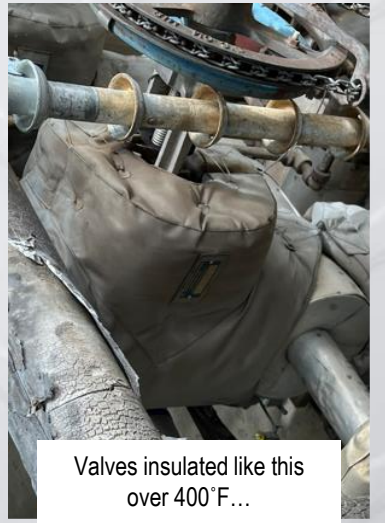
Moving forward, as insulation is removed from these flanges for maintenance, TAR, or other work, the insulation shall not be reinstalled unless it has been reviewed and approved by the Area Team or Fixed Equipment Engineer to ensure the insulated flanges meet the requirements in SP-50-16, SP-50-35, and SP-80-40. Expanded Metal/Metal Guards, per SP-80-41 Section 6.7, should be considered for personnel protection in lieu of insulating the flanges.

Additional guidance for the engineering review of insulated flanges has been added to the upcoming revisions for SP-50-16 and SP-50-35.

For any questions about new insulation being installed on flanges, contact your Area Team Engineer or Fixed Equipment Engineer.

Catlettsburg Insulated 450# Steam Piping Flange Leak

Robinson Bonnet Flange leak/fire (July 2023)



Process is 655˚F Gas Oil

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HIGH VALUE LEARNING EVENT (HVLE)

MPC Refinery Flange Leaks: Flanged Assembly Failure due to Insulation

- **SP-50-16, SP-50-35 & SP-80-40 Reference Material**
  - Each of these Core Specifications have similar wording, which follows: Flanged assemblies on valves, piping, or equipment with operating temperature above 400ºF shall not be insulated without approval from MPC Engineering.

- ☑ Operations
- ☑ Maintenance
- ☑ Technical
- ☐ Engineering

Recommendations	Assigned to:	Due Date:
Review this learning event with your leadership team, and cascade to your entire organization to ensure site-wide review to improve process safety hazard recognition.	Division Managers	5/31/2025
Review this HVLE with all Insulation Contractors at the site and ensure the contractors have an annual review of MPC insulation requirements.	Maintenance Managers	9/30/2025
Incorporate this HVLE into our TAR Bootcamp Program	Matt Bailey	9/30/2025

DISCUSSION TOPICS:

- Review the hazards associated with insulated flanges operating over 400˚F to refinery Operators, maintenance & craft personnel, inspection, contractors, and engineering. This should include an overview of the highlighted sections in SP-80-40 Section 9.5 Part b; Section 9.6 and Note 1 (slide 3).
- Refer to SP-50-16 for guidelines on performing an engineering review of insulated flanges. Also see SP-80-41 about personnel protection for hot flanges.
- Engineering should ensure that construction packages do not conflict with MPC Core Specs and Standards for insulation. e.g., “Removable blanket-type insulation shall be used at all blinding points, valves and instruments…”.
  Using this type of statement when the subject process/utility line is over 400˚F, can result in flanges **and** bolting being improperly insulated.
- Quality Verification Document (QVD) *CI.80.005 Piping Thermal Insulation Inspection Record* has been updated to include *“NOTE: Flanges and valve bonnets operating over 400°F shall not be insulated without approval from MPC Engineering.”*
  This will help to ensure flanges operating over 400˚F will not be insulated during future projects and turnarounds without proper review.

CI.80.005 Piping Thermal Insulation Inspection Record

Insulating Hot Pipes	YES	NO (EXPLAIN)	N/A
4. Proper material thickness used	☐	☐	☐
5. Flanges, flanged valve bodies, bonnets and flanged fittings insulated. NOTE: Flanges and valve bonnets operating over 400°F shall not be insulated without approval from MPC Engineering.	☐	☐	☐

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SP-80-40 DESIGN AND SELECTION OF INSULATION SYSTEMS REV1 SECTIONS 9.5 AND 9.6

9.5 Equipment for Which Insulation is Restricted, Prohibited, or *NOT* Required

Insulation should not be applied on the equipment listed below:

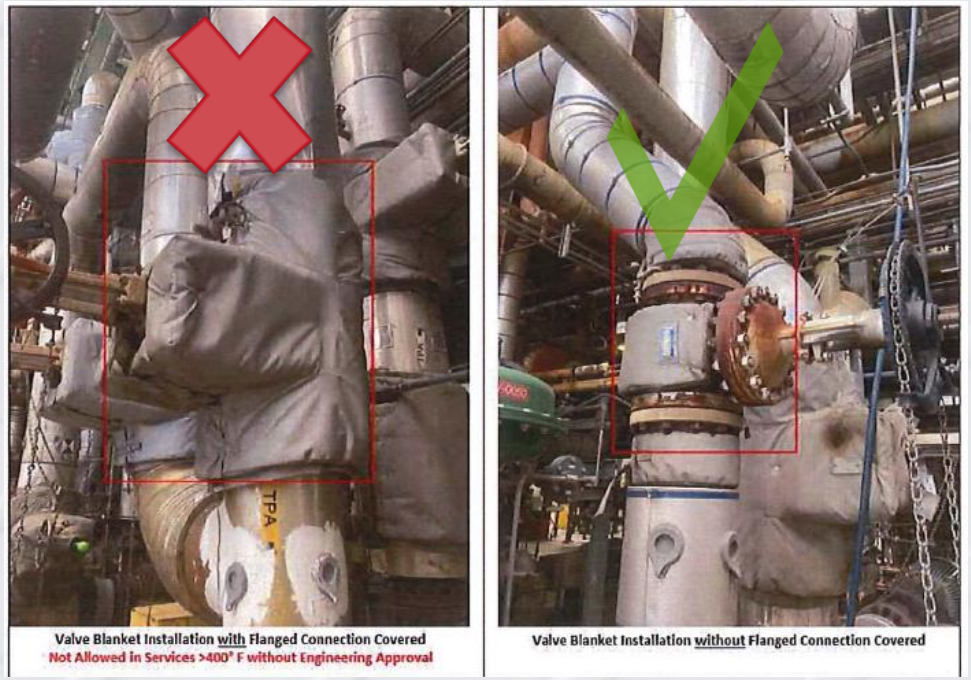
(a) Name plates, support legs, vessel skirts, saddle supports for equipment, and pipe plugs,

(b) Flanged connections, including valve bonnet flanges (operating >400°F),

Note: No flange bolting with operating temperature above 400°F shall be insulated without approval from MPC Engineering.

Note

SP-80-41 Section 6.7 discusses Expanded Metal/Metal Guards for personnel protection requirements on hot flanges.



Valve Blanket Installation with Flanged Connection Covered
Not Allowed in Services >400° F without Engineering Approval

Valve Blanket Installation without Flanged Connection Covered

9.6 Restrictions for Insulated Flanges and Valves

9.6.1 Flanged assemblies on valves, piping or equipment operating in any of the following conditions or services shall not be insulated:

(a) Services operating greater than 400°F,
(b) Hydrogen service,
(c) Highly corrosive fluids, such as concentrated acids,
(d) Dangerous chemicals, such as phenol or H_2S, and
(e) Cyclic services.

9.6.2 For systems containing flammable liquids, valves and flanged assemblies on piping or equipment with operating temperatures greater than 400°F shall not be insulated unless approved by MPC Engineering.

Important: Flange leaks in systems operating with flammable fluids at high temperature can cause saturation of the insulation materials and possible auto-ignition of the fluid.

9.6.3 Where insulation is required on flanges for freeze protection or process stability in sour service, the insulation shall be isolated from piping insulation to avoid H_2S migration from a leaking flange to another area.

Important: Insulated flanges will have a reduced MAWP if the uninsulated provisions were used in original design accordance with **ASME B31.3**.

9.6.4 Valve bonnets in purified terephthalic acid (PTA) slurry service should be insulated to avoid local precipitation due to cooling (see Section 9.7.1).

Notes:

(1) Valves and flange assemblies operating at temperatures > **400°F** are prone to leakage and shall **NOT** be insulated. If required by process operation, safety, or economic considerations, piping, including flanges, fittings, and valves operating < **400°F**, may be insulated.

(2) Valves and flange assemblies shall be insulated only for the following services:
- heat traced services,
- closed condensate services,
- any service requiring freeze protection, or
- where indicated on drawing or project specifications.

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Bring It Up!!!

If there are Safety questions or concerns you wish to discuss, please bring them up!