March 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	>0.30	0/0	1	0/0	0/0	1
🎯	-	*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

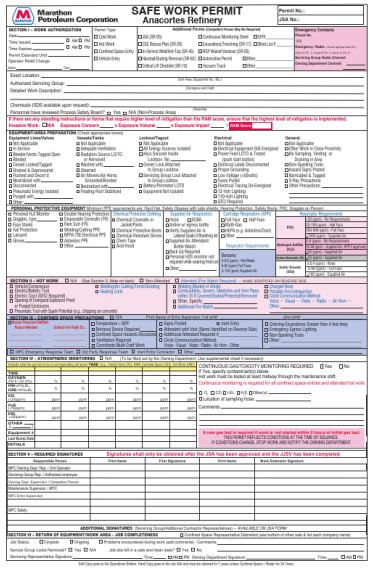
Start Safe and Stay Safe:

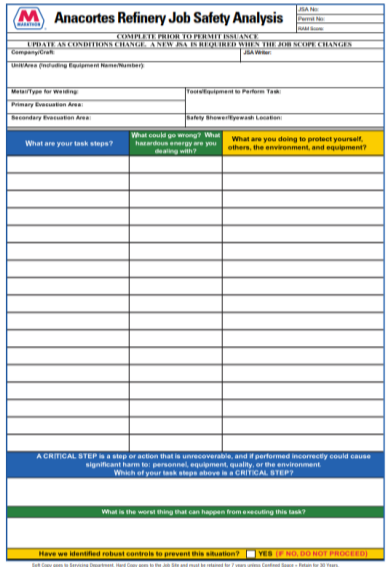
What are some ways you are Starting Safe and Staying Safe while completing your tasks during the 2025 Crude TAR?

Start Safe and Stay Safe:

Safe Work Permitting

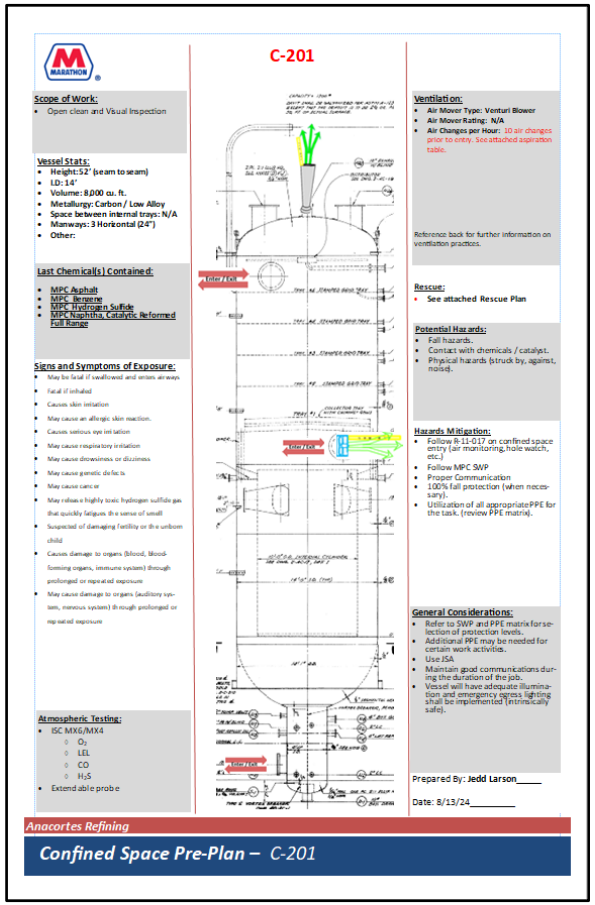
- Be aware of other activities and possible conflicts in the area of the permit
  - Is the requested work above or below existing work?
  - Is work being conducted in the same area already?
  - Is active fresh air, hot work, or automotive activity in the area?
- Permit Requests
  - Servicing Group will fill out JSA and top portion of the permit to provide to Operations.
  - Servicing Group should not request permits for work that they do not have manpower or time to perform.


Marathon Petroleum Corporation
SAFE WORK PERMIT
Anacortes Refinery


Anacortes Refinery Job Safety Analysis

Start Safe and Stay Safe:

- Are you going into a Confined Space?
  - If so, have you reviewed the CSE Plan?



C-201

Scope of Work:
- Open clean and Visual Inspection

Vessel Stats:
- Height: 52' (seam to seam)
- I.D: 14'
- Volume: 8,000 cu. ft.
- Metallurgy: Carbon / Low Alloy
- Space between internal trays: N/A
- Manways: 3 Horizontal (24")
- Other:

Last Chemical(s) Contained:
- MPC Asphalt
- MPC Benzene
- MPC Hydrogen Sulfide
- MPC Naphtha, Catalytic Reformed Full Range

Signs and Symptoms of Exposure:
- May be fatal if swallowed and enters airways
- Fatal if inhaled
- Causes skin irritation
- May cause an allergic skin reaction.
- Causes serious eye irritation
- May cause respiratory irritation
- May cause drowsiness or dizziness
- May cause genetic defects
- May cause cancer
- May release highly toxic hydrogen sulfide gas that quickly fatigues the sense of smell
- Suspected of damaging fertility or the unborn child
- Causes damage to organs (blood, blood-forming organs, immune system) through prolonged or repeated exposure
- May cause damage to organs (auditory system, nervous system) through prolonged or repeated exposure

Atmospheric Testing:
- ISC MX6/MX4
  - O_2
  - LEL
  - CO
  - H_2S
- Extendable probe

Ventilation:
- Air Mover Type: Venturi Blower
- Air Mover Rating: N/A
- Air Changes per Hour: 10 air changes prior to entry. See attached aspiration table.

Reference back for further information on ventilation practices.

Rescue:
- See attached Rescue Plan

Potential Hazards:
- Fall hazards.
- Contact with chemicals / catalyst.
- Physical hazards (struck by, against, noise).

Hazards Mitigation:
- Follow R-11-017 on confined space entry (air monitoring, hole watch, etc.)
- Follow MPC SWP
- Proper Communication
- 100% fall protection (when necessary).
- Utilization of all appropriate PPE for the task. (review PPE matrix).

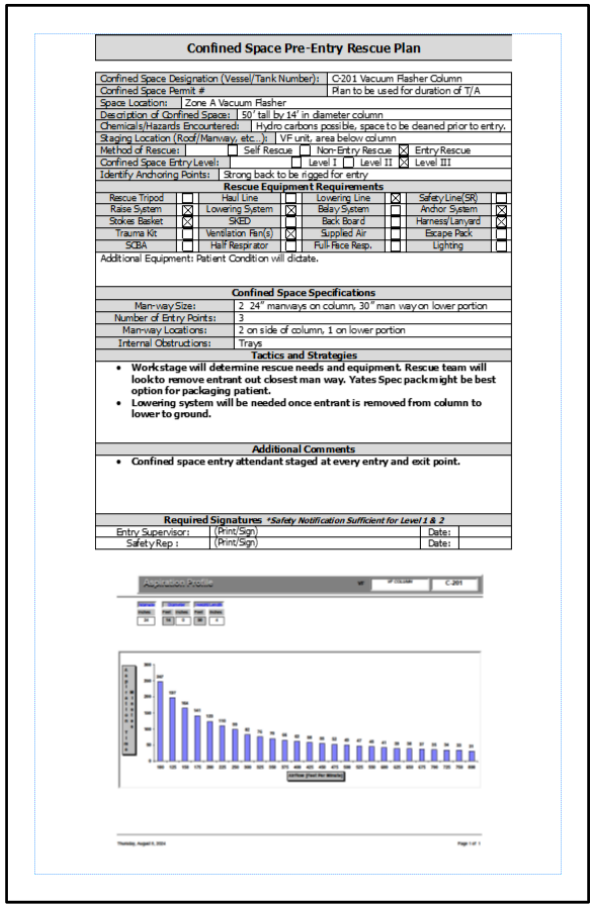
General Considerations:
- Refer to SWP and PPE matrix for selection of protection levels.
- Additional PPE may be needed for certain work activities.
- Use JSA
- Maintain good communications during the duration of the job.
- Vessel will have adequate illumination and emergency egress lighting shall be implemented (intrinsically safe).

Prepared By: Jedd Larson

Date: 8/13/24

Anacortes Refining

Confined Space Pre-Plan – C-201



Confined Space Pre-Entry Rescue Plan

Confined Space Designation (Vessel/Tank Number):	C-201 Vacuum Flasher Column
Confined Space Permit #	Plan to be used for duration of T/A
Space Location:	Zone A Vacuum Flasher
Description of Confined Space:	50' tall by 14' in diameter column
Chemicals/Hazards Encountered:	Hydro carbons possible, space to be cleaned prior to entry.
Staging Location (Roof/Manway, etc..)s:	VF unit, area below column
Method of Rescue:	☐ Self Rescue ☐ Non-Entry Rescue ☒ Entry Rescue
Confined Space Entry Level:	☐ Level I ☐ Level II ☒ Level III
Identify Anchoring Points:	Strong back to be rigged for entry

Rescue Equipment Requirements

Rescue Tripod	☐	Haul Line	☐	Lowering Line	☒	Safety Line(SR)	☐
Raise System	☒	Lowering System	☒	Belay System	☐	Anchor System	☒
Stokes Basket	☒	SKED	☐	Back Board	☐	Harness/ Lanyard	☒
Trauma Kit	☐	Ventilation Fan(s)	☒	Supplied Air	☐	Escape Pack	☐
SCBA	☐	Half Respirator	☐	Full-Face Resp.	☐	Lighting	☐

Additional Equipment: Patient Condition will dictate.

Confined Space Specifications

Man-way Size:	2 24" manways on column, 30" man way on lower portion
Number of Entry Points:	3
Man-way Locations:	2 on side of column, 1 on lower portion
Internal Obstructions:	Trays

Tactics and Strategies
- **Workstage will determine rescue needs and equipment. Rescue team will look to remove entrant out closest man way. Yates Spec pack might be best option for packaging patient.**
- **Lowering system will be needed once entrant is removed from column to lower to ground.**

Additional Comments
- **Confined space entry attendant staged at every entry and exit point.**

Required Signatures **Safety Notification Sufficient for Level 1 & 2*

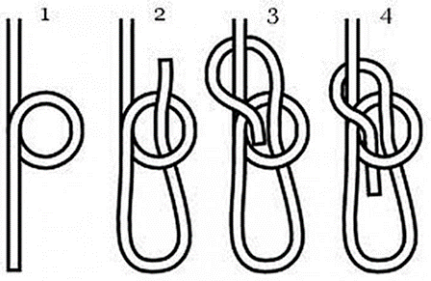
Entry Supervisor:	(Print/Sign)	Date:
Safety Rep :	(Print/Sign)	Date:

Start Safe and Stay Safe:

Dropped Objects

- Mitigation Techniques for controlling dropped tools and materials
  - Catching Method
  - Handrail Method
  - Tethering
  - Storage
  - Hoisting

- How are you preventing objects from being dropped?



Dropped Objects Policy R-11-042

Start Safe and Stay Safe:

Barricades

- Must be tagged with Barrier Tape Tag
  - Installation date
  - Reason for the tape
  - Person who put it up,
  - Company installing the tape

Yellow = Caution

Red = IDLH or Fresh Air

- Tape **cannot** be secured to process pumps, process controls, instrument air lines, lines ½" or less, or safety equipment (items painted red or green). Do not tie barricade tape to valve stems and hand wheels.

- Barricade only those areas required for the work to be done. If possible, leave access way between jobs.

Automotive Barricade Tape

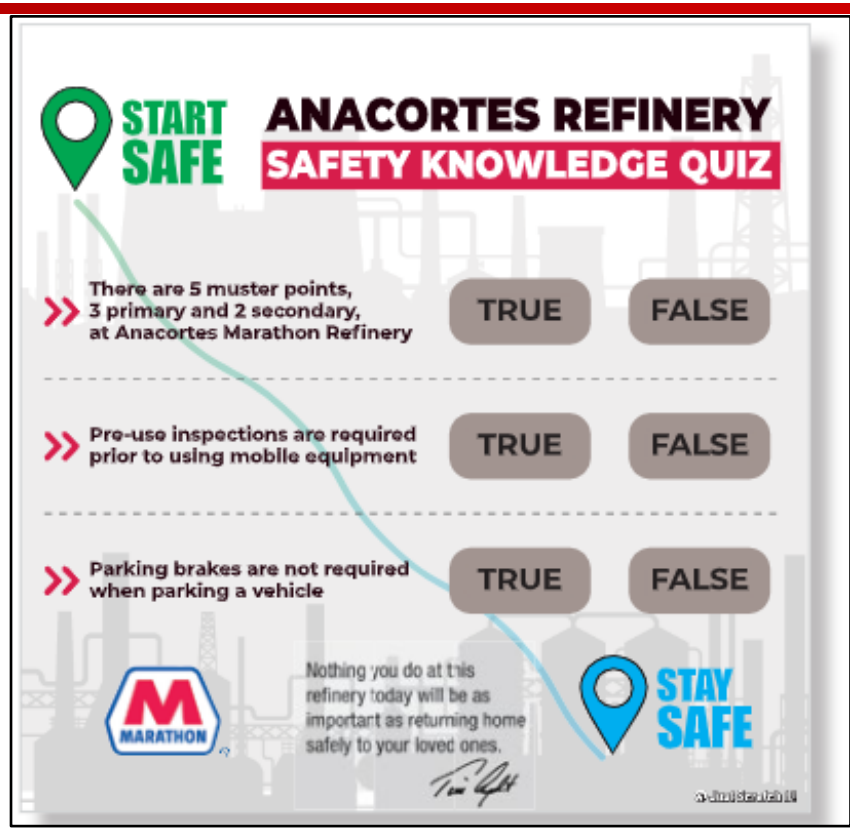
Crane Lift Tape

Take barricades down when the job is done!!!

Start Safe and Stay Safe:

- Knowledge Scratch Off Cards (Start Safe)
  - Engagement to local safety requirements.
  - True/False Questions.
  - Chance to win a nice prize at weekly drawing (JBL speaker, Beats, Blackstone, 58" TV).

- Stay Safe Scratch Card
  - Promote staying safe on the job.
  - 50% winner.
  - Smaller prize (Hat, Badge-Holder, Backpack, YETI Mug, Leatherman, Candy).



Start Safe and Stay Safe:

Engagement Questions

- What steps will you take so we achieve a Safe turnaround?
- What does good look like when keeping others safe during this turnaround?
- Are there any safety requirements you are unsure about and would like more clarification on?

1 Permit Deviation
1 Tier 1 DEI

Environmental Reminder for Turnaround:

Please keep Environmental in the loop! Give us a call, day or night for:

- Flaring/Visible Emissions
- Spills – more than one barrel to ground
- Any amount of oil spilled to water
- Atmospheric PSV lifts
- Non-routine discharge to the oily water sewer
- Any other event that could impact air or water quality, or have offsite impacts

Thanks for reaching out to us!

PSE1 MPC Process safety advisory

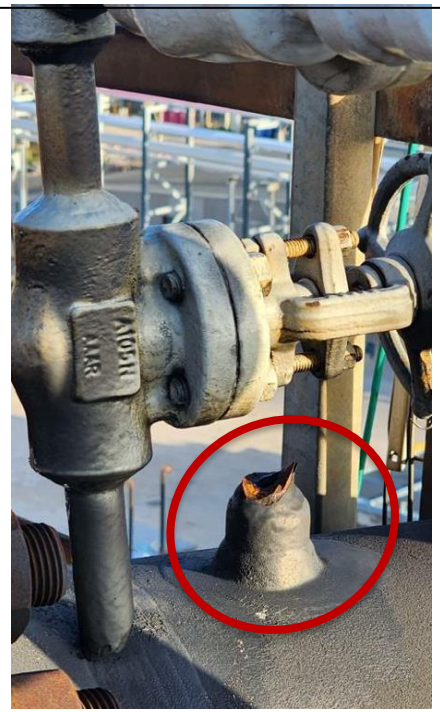
GALVESTON BAY PIPING FATIGUE FAILURE INC# 391879
SALT LAKE CITY DISTILLATE HYDROTREATER UNIT LEAK INC# 402811

PSA 25-02

Published 2/18/2025

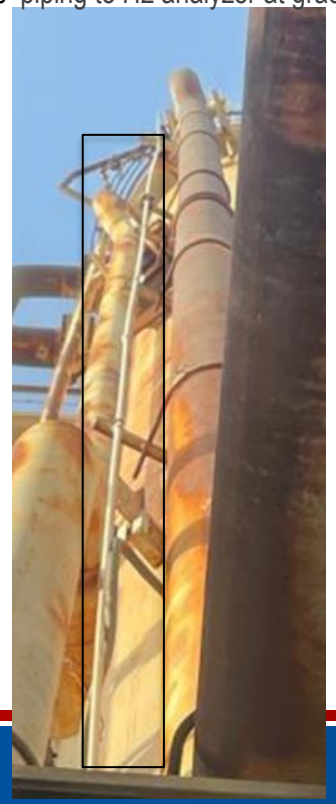
(GBR) On August 11, 2023, a failure occurred on an unsupported ¾" pipe nipple welded to a 14" overhead line of the GBR Cat Feed Hydrotreating Unit's (CFHU) High Pressure Monoethanolamine (MEA) Tower. The failed ¾" pipe nipple connects an overhead pressure transmitter and H2 analyzer to the 14" overhead line. The pressure transmitter is located directly above the vessel, while the H2 analyzer is at ground level, approximately 100' below the piping connection.

- This incident was categorized as a PSE1 due to the release of 11,088 lbs. of light, flammable material.



Original piping tree prior to replacement

~100' piping to H2 analyzer at grade



Causal Factors:

- The piping tree weight increased when replaced with schedule XXS (0.312" thickness) from original piping schedule 160 (0.219" thickness). A stress analysis was not performed to determine the additional support needs of the cantilevered piping.
- A MOC was not performed to assess the hazard or document changes made to the piping tree during the October 2022 turnaround.

"THE REST OF THE STORY":

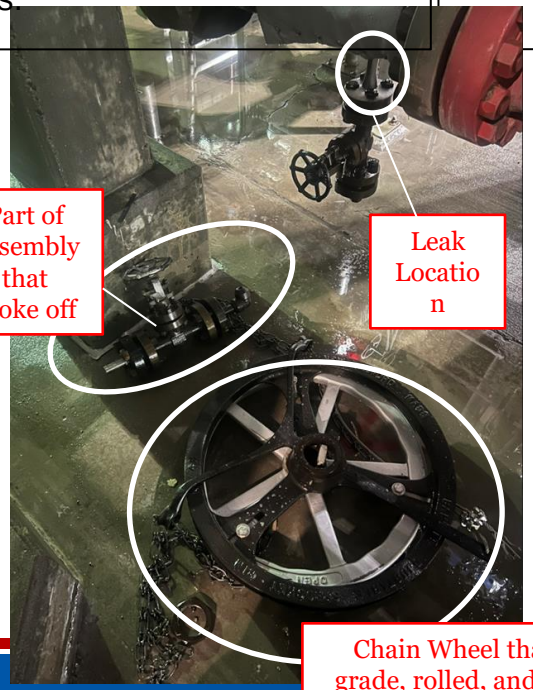
The ¾" pipe tree had been replaced during the 3rd Quarter 2022 CFHU Turnaround with the intent to replace the piping in kind. The original piping was fabricated with schedule 160 components (0.219" thickness), and the MPC Core Line Class Specification (G2AV) also specified the use of schedule 160 components. However, the new branch piping was fabricated using schedule XXS components (0.312" thickness). This included the 100 ft run of pipe from tower overhead to grade, increasing the weight by 54 lbs. A management of change (MOC) was not entered to document these changes, and a stress analysis was not performed to evaluate if the new pipe tree needed pipe supports. Due to the lack of pipe supports and material thickness change, the branch piping was subject to a fatigue failure mechanism, which was validated by a metallurgy lab post-failure. Supports were added to the branch piping to prevent vibration and fatigue.

PSE1 MPC Process safety advisory

GALVESTON BAY PIPING FATIGUE FAILURE INC# 391879
SALT LAKE CITY DISTILLATE HYDROTREATER UNIT LEAK INC# 402811

(SLC) On October 28, 2023, a loss of containment event occurred on the SLC Distillate Hydrotreater Unit (DHT) resulting in a PSE 1. Severe vibrations, caused by a chattering high pressure separator level control valve (LCV-260414), resulted in fatigue cracks on the bleeder valve upstream of LCV-260414. The vibrations also caused a chain wheel assembly to fall and contact the same bleeder valve upstream of LCV-260414. The cable restraint on the chain wheel assembly was not attached. The combination of the fatigued welds and contact from the chain wheel assembly opened the crack large enough to cause loss of containment.

- This incident was categorized as a PSE1 due to a release of 13.7 bbls of unstabilized diesel an es



Causal Factors:

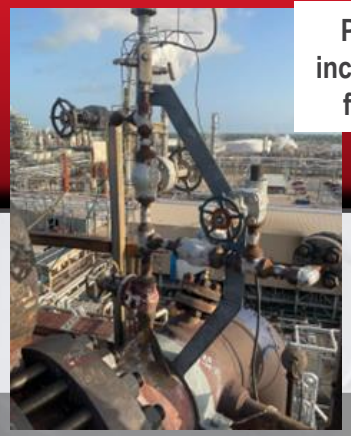
- The failed welds were analyzed and found to have signs of metal fatigue and some rust which indicates that the cracks in the weld were not caused solely by the events on 10/28/2023 but began before that. It is believed that that severe vibrations on 10/28/2023 caused the existing cracks to grow larger.
- The small-bore bleeder piping was built with double block valves. Due to the high-pressure rating of the piping, the flanges are very heavy and put a lot of stress on the elbow and piping connections. This design is subject to fatigue failure through the course of its life due to a long, unsupported lever arm.
- Severe vibration in the piping was observed by the operators as LCV-260414 was rapidly opening and closing. It is believed that the rapid cycling of LCV-260414 was the source of the vibration.

"THE REST OF THE STORY":

The exact cause of the rapid cycling of LCV-260414 causing the vibration is unknown. After the unit was shutdown, LCV-260414 did pass a simple stroke test. The valve plug and cage was visually inspected from one side and found with no obvious damage or obstruction. It was decided to replace the Digital Valve Controller (DVC) on LCV-260414 as a proactive measure prior to unit restart. The DVC was sent to the vendor for diagnostic testing, and no issues were identified.

The investigation team could not determine exactly when the chain wheel operator was installed without the cable restraint. After the incident, other chain wheel operators in the unit were surveyed, and their cable restraints were found to be installed properly.

- [x] Operations
- [x] Maintenance
- [ ] Technical
- [x] Engineering



Piping Repairs including supports for GBR Event

DISCUSSION TOPICS:

- Review video link: Hazards of Piping Vibration and Inadequate Piping Support
- Review PSA 15-02 Hazards of Piping Vibration
- All personnel need to be aware of increased vibration and noise in the field and alert appropriate resources to mitigate issue.
- A new IG-84 Piping Vibration Special Emphasis Program is being rolled out to complete piping/tubing vibration surveys at all sites over the next few years.

Maintenance/Inspection:

- Changes to work scope or details may be identified in the field by the work crew during installation or through Inspection and QA/QC. These changes must be communicated back to engineering and a thorough evaluation performed.

Engineering:

- A MOC is required for any deviation from original installation, including increased wall thickness.
- When performing an evaluation of new or replacement piping, consider the need for additional support, particularly for cantilevered components on branch piping connections. Reference SP-90-10 (Piping Inspection) Section D.15.3.

Operations:

- Be aware of and report large amounts of small-bore cantilevered components on branch piping connections.
- Is there any piping with double bleeder assemblies in your area that vibrates and has the potential for fatigue failure? Have you reached out to the Inspection Group with this concern?
- Does your site follow SP-50-33 by installing safety cables around chain wheel Operators?
- Are you aware of any missing chain wheel safety cables? If so, work with Area Team Leader to install immediately. See more information on safety cables on the next page.

Global Action

Recommendations	Assigned to:	Due Date:
Review this advisory with your leadership team, and cascade to your entire organization to ensure site-wide review to improve process safety hazard recognition	Division Managers	4/30/2025
Provide additional guidance in MPC piping specifications and/or training of technical personnel on the following: - Pipe stress analysis requirements and methods - Pictures of what is acceptable for branch components - Pipe support requirements for cantilevered piping components and/or branch piping connections	Action assigned in the GBR UU3 PSA 24-07 Recommendation # 324499	
Update SP-90-10 Piping Inspection Program with the latest RAGAGEP regarding piping vibration and how to conduct a field survey.	Complete	

Marathon Petroleum Company LP

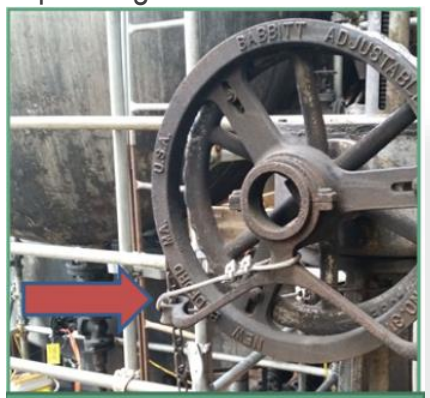
Chainwheel operator

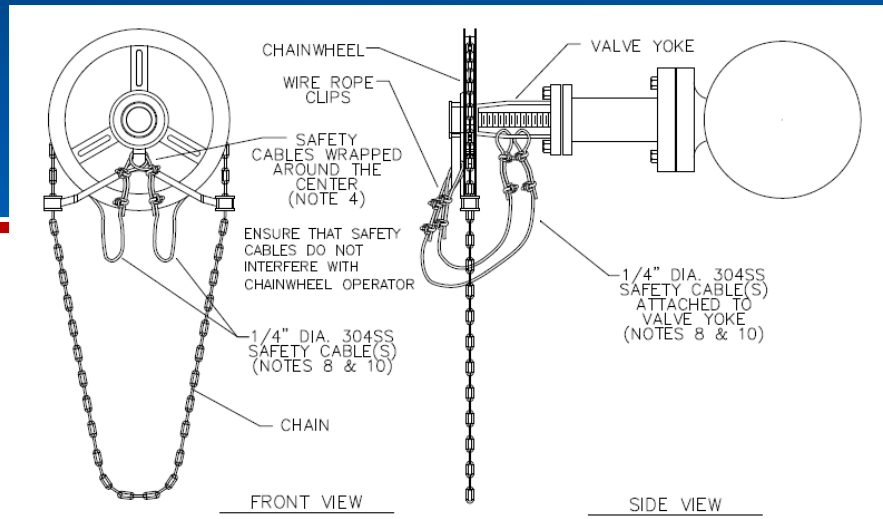
A periodic inspection should be performed on chain wheel valves:

- First check your position. Ensure you're not in the line of fire.
- Is chain wheel properly secured? Is hardware tight, nothing missing or visibly loose?
- Is the safety cable in place?
- Is the cable secured in proper location, routed through both chain guides, and not jammed or tangled?
- Does it have 2 cable clamps on each end, and are they installed correctly, with the nuts of the clamp on the long end of the cable?
- Is wheel sprocket intact (no cracks or missing parts) and properly centered so it will operate well?
- Is chain long enough to operate safely? Are you able to stand to the side while operating it to stay out of the line of fire?
- Does the chain show any signs of damage?

Video Link on Chain Wheel Operated Valve Hazard Mitigation
Quality Bulletin on Installation of a Chainwheel Operated Valve


Missing Safety Cables


Jammed Cable & Chain



IMPORTANT: WHEN TWO CABLES ARE REQUIRED, ONE OF THEM SHALL HAVE A 4–INCH DIFFERENCE IN INSTALLED LENGTH.

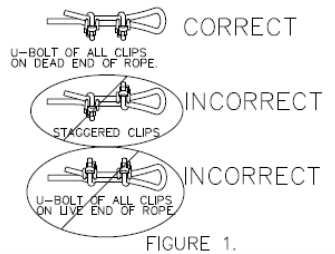


FIGURE 1.

TABLE 1: SAFETY CABLE MATERIAL SELECTION (NO

VALVE HANDWHEEL SIZE/VALVE SIZE	MATERIALS (QTY)
HANDWHEEL DIA. <= 19 IN. AND VALVES <= NPS 10	(1) 1/4" DIA. X 76" LG. 304SS (60" (7 X 19 CABLE CORE CONSTRUCTION) (4) 1/4" TYPE 316SS WIRE ROPE CLI BABBITT SCKIT–0 OR ROTO HAMMER RCK–1/4 (NOTES 11 & 12)
HANDWHEEL DIA. > 19 IN. OR VALVES > NPS 10	(1) 1/4" DIA. X 76" LG. 304SS (60" (7 X 19 CABLE CORE CONSTRUCTION (1) 1/4" DIA. X 72" LG. 304SS (60" (7 X 19 CABLE CORE CONSTRUCTION (8) 1/4" TYPE 316SS WIRE ROPE CL
ALL VALVES WITH A HAMMER BLOW DEVICE	BABBITT SCKIT–4R OR ROTO HAMME (QTY–2) RCK–1/4 (NOTE 12)

(NOTE 6)

Shutting Down Units in Preparation for TAR

HERE is a CSB report and video that provides a great reminder of how critical it is to safely shut down equipment and units.

This is related to the explosion and fire incident @ Husky Energy Superior Refinery in Superior, WI on 04/26/2018 .

This investigation is a good reminder of how important the 14 elements of process safety are in safe unit shutdowns and startups : Procedures, Training, MOC, PSSR, PHA, Mechanical Integrity, Emergency Planning and Response, Contractors, PSI, to name a few.

LINK TO INVESTIGATION

The Final Report was released on 12/29/2022.

Refining Bulletin Clarification-Super Sack Lifting Loop Incident

Great job by Garrett Hong!

- While reviewing a Refining Bulletin on Super Sack Lifting Loop Failure from an Incident at our Robinson Refinery on September 10, 2024, he noted in this photo that it shows using a forklift to lift the supersack. We should never hang anything directly from the forks of a forklift. The forks have a sharp edge; movement can cut or burn the straps causing them to fail.
- Contact Safety Department with any question or concerns.

2025 PROCESS SAFETY TAR STICKER CONTEST

And the Winner Is!

The Anacortes Process Safety Council would like to congratulate **Jordan Montoya** for her winning TAR sticker design.

The other stickers that will be printed are:

Willie Fanaurai

SECOND

Clay Hathaway

THIRD

Diane Rusher

Bring It Up!!!

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