



PEMEX Deer Park Investigation and Lessons Learned in Industry

Contra Costa Community
Awareness Emergency Response
Safety Summit

August 13, 2026

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U.S. Chemical Safety and
Hazard Investigation Board

- **About the CSB**
- **Open Investigations**
- **Lessons for Industry from Recent Contractor Incidents**
 - Overview of Contractor Safety Principles – Center for Chemical Process Safety (CCPS)
 - Lessons Learned from Recent Contractor Incidents
 - PEMEX Deer Park fatal hydrogen sulfide release; Deer Park, Texas
 - PBF Energy Fire; Martinez, California
 - Olin Chlorine Release; Freeport, Texas

About the CSB



- The CSB's mission is to **drive chemical safety excellence through independent investigations to protect communities, workers, and the environment.**
- Independent, nonregulatory federal agency
- The Board is a group of 5 individuals nominated by the President
- From 42 U.S. Code § 7412 (6)(C)(i):
 - “The Board shall investigate...determine and report to the public in writing...the cause or probable cause of any accidental release resulting in fatality, serious injury, or significant property damages.”
- Companies are required to report incidents to the CSB (40 C.F.R. Part 1604)

Legislative Authority 42 U.S. Code § 7412

(6) Chemical Safety Board

(A) There is hereby established an independent safety board to be known as the Chemical Safety and Hazard Investigation Board.

(B) The Board shall consist of 5 members, including a Chairperson, who shall be appointed by the President, by and with the advice and consent of the Senate. Members of the Board shall be appointed on the basis of technical qualification, professional standing, and demonstrated knowledge in the fields of accident reconstruction, safety engineering, human factors, toxicology, or air pollution regulation. The terms of office of members of the Board shall be 5 years. Any member of the Board, including the Chairperson, may be removed for inefficiency, neglect of duty, or malfeasance in office. The Chairperson shall be the Chief Executive Officer of the Board and shall exercise the executive and administrative functions of the Board.

(C) The Board shall-

(i) investigate (or cause to be investigated), determine and report to the public in writing the facts, conditions, and circumstances and the cause or probable cause of any accidental release resulting in a fatality, serious injury or substantial property damages;

(ii) issue periodic reports to the Congress, Federal, State and local agencies, including the Environmental Protection Agency and the Occupational Safety and Health Administration, concerned with the safety of chemical production, processing, handling and storage, and other interested persons recommending measures to reduce the likelihood or the consequences of accidental releases and proposing corrective steps to make chemical production, processing, handling and storage as safe and free from risk of injury as is possible and may include in such reports proposed rules or orders which should be issued by the Administrator under the authority of this section or the Secretary of Labor under the Occupational Safety and Health Act [29 U.S.C. 651 et seq.] to prevent or minimize the consequences of any release of substances that may cause death, injury or other serious adverse effects on human health or substantial property damage as the result of an accidental release; and

(iii) establish by regulation requirements binding on persons for reporting accidental releases into the ambient air subject to the Board's investigatory jurisdiction. Reporting releases to the National Response Center, in lieu of the Board directly, shall satisfy such regulations. The National Response Center shall promptly notify the Board of any releases which are within the Board's jurisdiction.

(D) The Board may utilize the expertise and experience of other agencies.

(E) The Board shall coordinate its activities with investigations and studies conducted by other agencies of the United States having a responsibility to protect public health and safety. The Board shall enter into a memorandum of understanding with the National Transportation Safety Board to assure coordination of functions and to limit duplication of activities which shall designate the National Transportation Safety Board as the lead agency for the investigation of releases which are transportation related. The Board shall not be authorized to investigate marine oil spills, which the National Transportation Safety Board is authorized to investigate. The Board shall enter into a memorandum of understanding with the Occupational Safety and Health Administration so as to limit duplication of activities. In no event shall the Board forego an investigation where an accidental release causes a fatality or serious injury among the general public, or had the potential to cause substantial property damage or a number of deaths or injuries among the general public.

THE BOARD



Chairperson
Steve Owens



Board Member
Dr. Sylvia Johnson

Shell Polymers Butadiene and Benzene Fire

- Monaca, Pennsylvania
- June 4, 2025

Austin Powder & U.S. Nitrogen NO_x Releases

- Midway, Tennessee and McArthur, Ohio
- November 24, 2024, and June 11, 2025

Horizon Biofuels Fatal Explosions

- Fremont, Nebraska
- July 29, 2025

Accurate Energetic Systems Fatal Explosion

- McEwen, Tennessee
- October 10, 2025

Woodland Pulp Fatal Hydrogen Sulfide Release

- Baileyville, Maine
- January 27, 2026

Catalyst Refiners Fatal Chemical Release

- Nitro, West Virginia
- April 22, 2026

Nippon Dynawave Fatal Tank Collapse

- Longview, Washington
- May 26, 2026

For more info, visit www.csb.gov

Contractor Safety - Introduction

Regulator and Industry Expectations – OSHA and CCPS

The Company

- ✓ Evaluate the company's safety performance
- ✓ Inform the contract employers of hazards
- ✓ Explain the emergency action plan
- ✓ Develop and implement Safe Work Practices to control contractors
 - ✓ Lockout/Tagout
 - ✓ Confined Space
 - ✓ Opening Equipment and Piping
 - ✓ Entrance into a facility
- ✓ Evaluate contractor performance
- ✓ Log contractor injury and illnesses

The Contractor

- ✓ Train workers to safely perform their job
- ✓ Instruct each worker on hazards and EAP
- ✓ Document training completion
- ✓ Enforce site rules and Safe Work Practices
- ✓ Advise company of unique hazards of contract work

Despite this guidance, incidents involving contractors continue to occur

***Lessons Learned from recent
CSB Investigations***



U.S. Chemical Safety and
Hazard Investigation Board

PEMEX Deer Park

October 10, 2024 | Deer Park, Texas

PEMEX Deer Park

October 10, 2024 | Deer Park, Texas



Incident Summary

October 10, 2024 – Day of the incident

- Approximately 27,000 pounds of toxic hydrogen sulfide were released
- Two contractors were fatally injured, and several others were injured
- Shelter-in-place orders for Deer Park, Texas, and Pasadena, Texas
- \$12.3 million in property damage for loss of use
- The release lasted nearly an hour until PEMEX Deer Park responders reassembled the leaking flange

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Sulfur Unit Turnaround

October 3, 2024 – 7 days before the incident

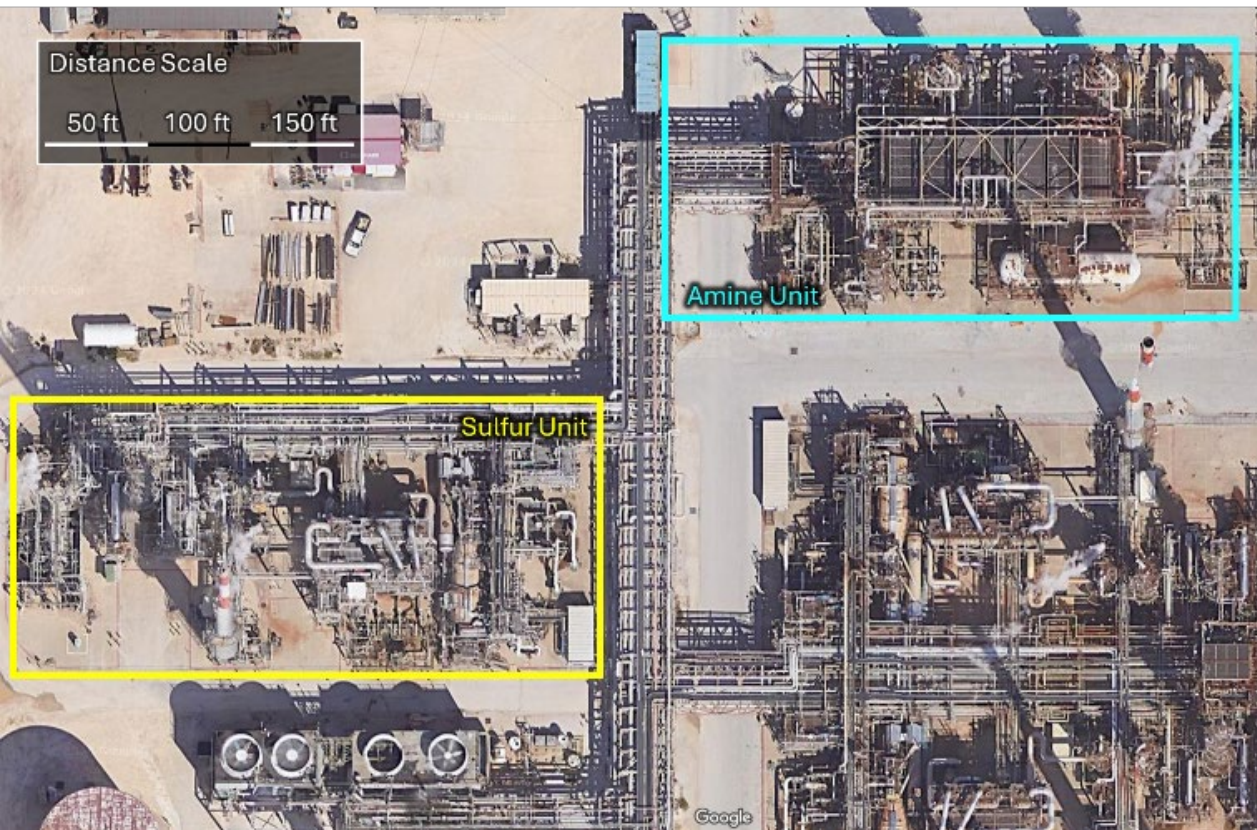
- PEMEX Deer Park begins Sulfur Unit shutdown for Turnaround
- Repcon begins Turnaround boilermaker and pipefitting tasks

October 6, 2024 – 4 days before the incident

- Sulfur Unit is shut down, empty, and isolated – “Positive Isolation”
- PEMEX Deer Park operators marked the location of blinds with **blind tags**
- Repcon workers isolated piping and secured piping with **flange locking devices**
- Repcon continued with similar Turnaround tasks through October 10

PEMEX Deer Park

October 10, 2024 | Deer Park, Texas



Amine Unit Maintenance

October 8, 2024 – 2 days before the incident

- PEMEX Deer Park prepared the Amine Unit for maintenance
- Unlike the Sulfur Unit, the Amine Unit was partially operational – “Run and Maintain”
- PEMEX Deer Park operators hung blind tags on piping like they would do in the Sulfur Unit
- On Blind 407, the operator hung the blind **tag** on the platform railing above the piping
- Nightshift Repcon workers installed 15 blinds in the Amine Unit piping and placed flange-locking devices on each flange
- PEMEX Deer Park did not require **flange-locking devices** for the Amine Unit task and the PEMEX Deer Park operator was unaware the workers placed the devices
- On October 9th, Amine Unit maintenance was complete

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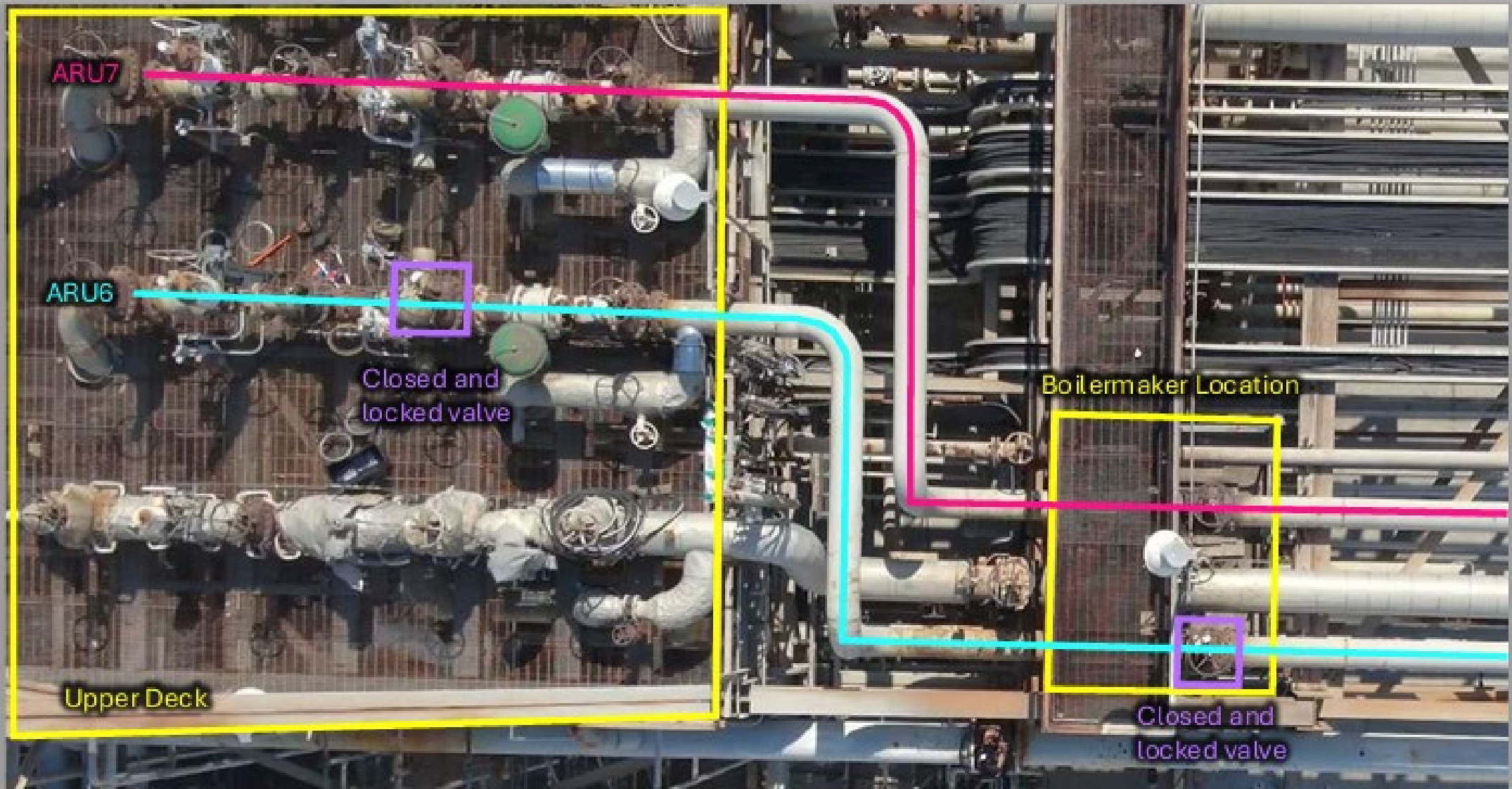
Amine Unit Blind Removal

October 10, 2024 - Day of the incident

- PEMEX Deer Park issued a work permit to Repcon to remove the 15 blinds in the Amine Unit
- Two of the blinds were located on piping containing **acid gas**
- Operator gave Repcon Foreman a drawing and a list of blinds
- Operator and Foreman completed a walkthrough, but did not visit the acid gas blinds
- Repcon Foreman gathered four Dayshift Boilermakers – all working only in Sulfur Unit Turnaround since October 3rd
- Boilermakers removed 13 of the 15 blinds
- Looked for **blind tags** or **flange-locking devices** – used to seeing them in the Sulfur Unit

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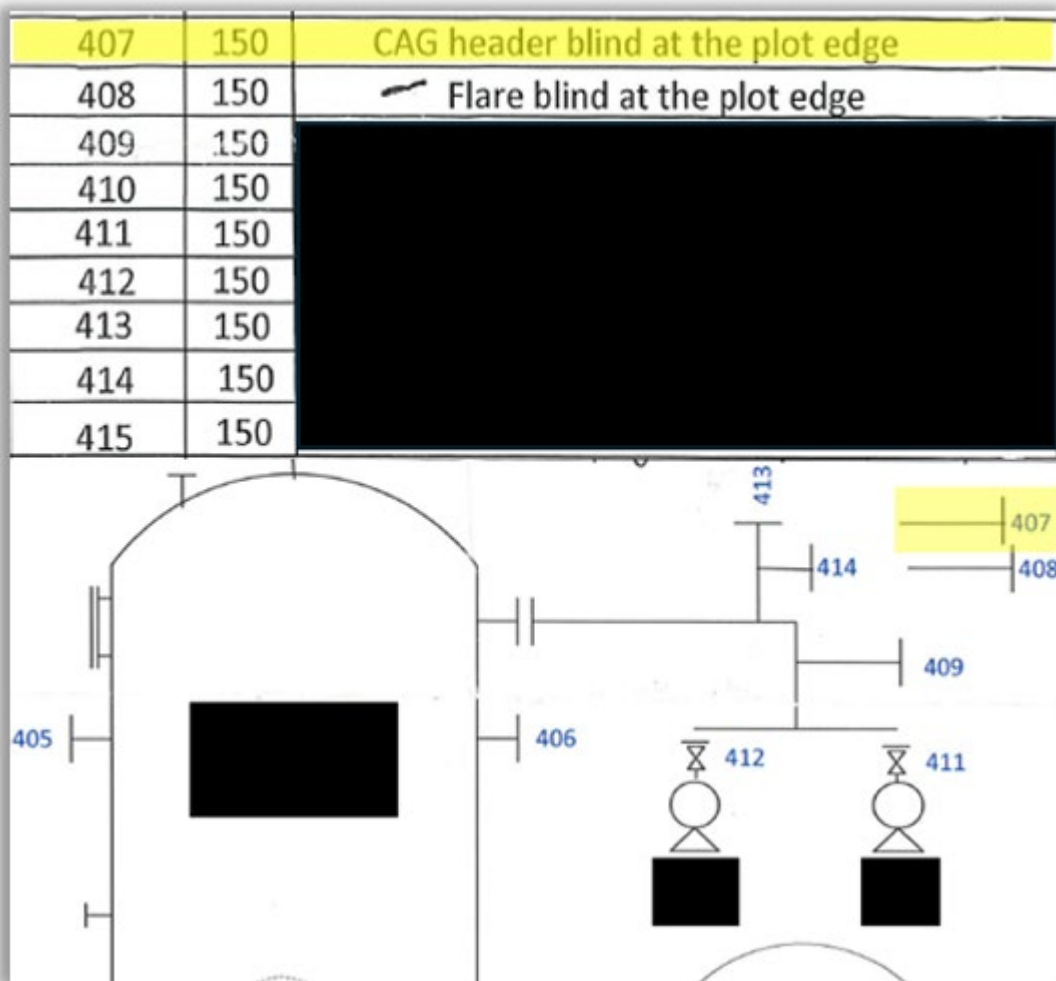
October 10, 2024 | Deer Park, Texas



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Authorization to
remove Blind 407 on
Acid Gas piping

Authorization to
remove first 13 blinds



PERMIT TO WORK

Permit type: A or B (circle one) Unit/Area: Acid Gas / Sulfur Equipment #: [Redacted]
Company/Craft: Repscon / Filters Issue Date: 10/10/24 Expires Date: 10/14/24
Job Description: Blind 407, Blind 408, CAG + Flare, will be done

ENTRY PERMIT # [Redacted] PRODUCT Lean Gas SDS/Product Code #(s) [Redacted]

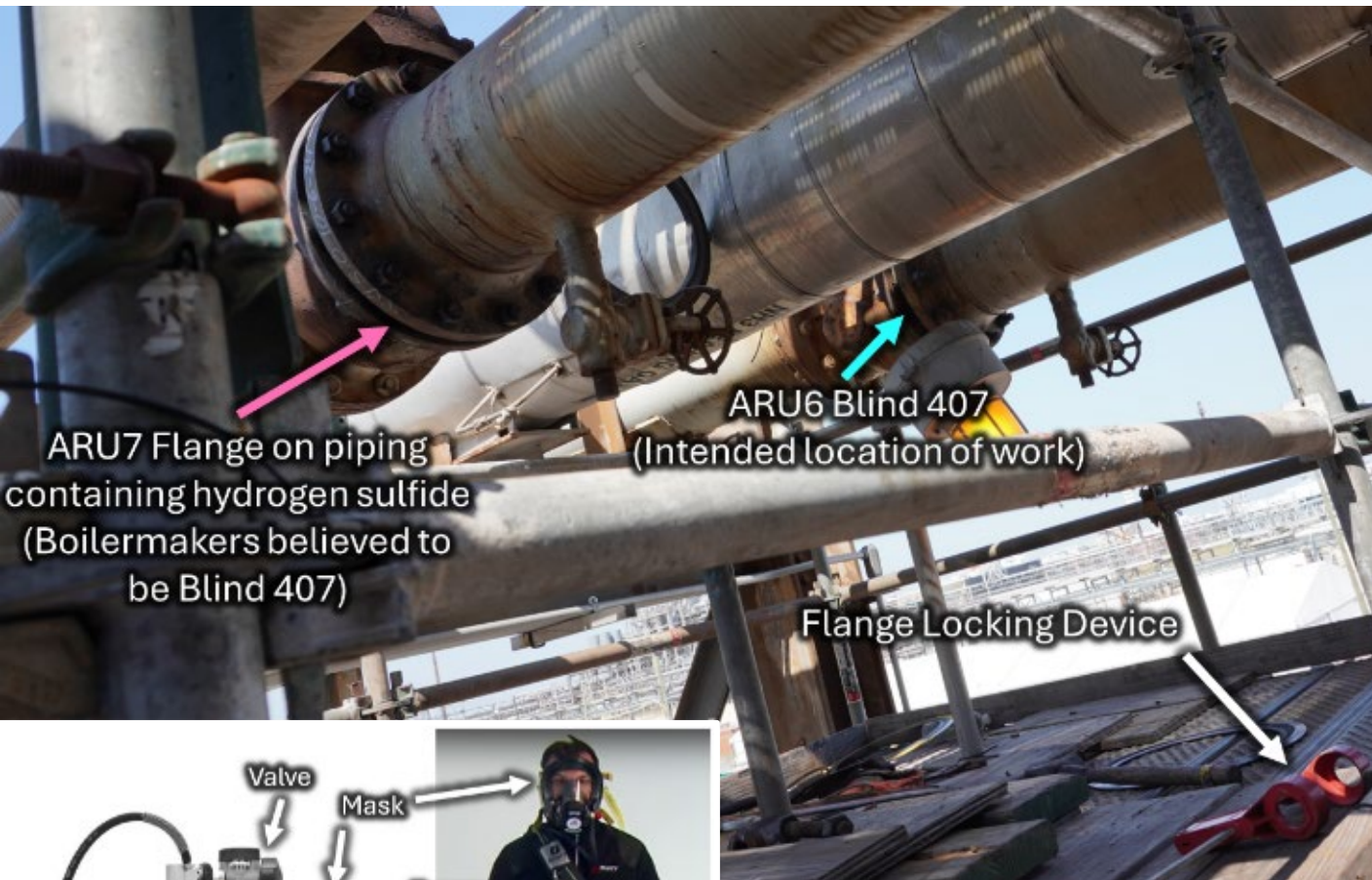
Emergency Response Information "For Fires, Gas Releases, Rescues, or Medical Emergencies" Call 6-4444
Grid Map Location [Redacted] Cross Streets [Redacted]
Primary Assembly Area [Redacted] Secondary Assembly Area [Redacted]

Atmospheric Testing Required ☒ Yes ☐ No % Oxygen Atmospheric Gas Tester: <u>[Redacted]</u> % LEL Was GC used to analyze Sample? Yes or No <u>Yes</u> If yes, GC results must be attached to permit PPM - List Components tested and results for each <u>H2S, SO2, CO, P2O5</u>	Automotive Entry ☒ Yes ☐ No Continuous Atmospheric Monitoring required Shut down engines to refuel Do not leave motors running unattended Stop work/Shut down motors if leak occurs List Equipment: <u>[Redacted]</u>	Electrical Safety Req. ☒ Yes ☐ No Ohms Test Results ≤ 1 Tools/Equipment grounded GFCI in place Non-rated equipment is attended Other: <u>Testing Drill</u>
Process LOTO Required? ☒ Yes ☐ No Direct Isolation ☐ Group Isolation ☐ Chained & Locked ☐ Isolation List in EIF ☐ Tagged ☐ Isolation Drawing in EIF ☐ Blinded ☐ Lock Box# <u>[Redacted]</u> Air Gapped ☐ Lock Seal# <u>[Redacted]</u> Exclusive Control ☐	Electrical LOTO Required? ☐ Yes ☒ No Circuit breaker open ☐ Disconnected & tagged Operations Lock & Tag(s) ☐ Energized job prep checklist completed Maintenance Lock & Tag(s) ☐ Ops & Maint. Tags hung for troubleshooting Start / Stop station tagged ☐ Safety Ground installed and tested Circuit breaker closed ☐ Standby to guard Disconnect Device Disconnect Device within sight & <15' from work	Equipment Condition ☐ Full ☒ Empty ☐ N/A If empty, indicate how it was decontaminated. Drained/Pumped Out ☐ Steam Purged ☐ Depressurized ☐ Other: <u>[Redacted]</u> Water Washed ☐ Nitrogen Purged ☐ Vented ☐ Chemically Cleaned ☐ Bleeders Open ☐
PPE & Other Safety Requirements Goggles/Faceshield (Circle one) ☐ Goggles ☐ Faceshield ☐ Gloves (Leather/Chemical/Electrical) Type <u>[Redacted]</u> Hood (Chemical/Thermal/Welding/Blasting) ☐ Suit (Chemical/Thermal/FR Tyvek/Tyvek) ☐ Boots (Chemical/Rubber/Thermal) ☐ Safety Harness (Lanyard/SRL) ☐ Hearing Protection ☐ Single ☐ Double		
PPE Requirements for first 13 blinds (No Acid Gas Hazard) ☐ Air Purifying Respirator Type <u>[Redacted]</u> ☒ Fresh Air Job ☒ Supplied Air Respirator - SAR IDLH Job ☐ Airline resp. with egress ☐ Standby with S.C.B.A. ☐ Bottle Watch required ☐ & instructions issued ☐		
PPE Requirements for Blind 407 and 408 (Acid Gas Hazard Present) Regulated area (i.e. benzene, asbestos) established ☐ Barricade Area ☐ Safety shower/eyewash located ☐ Heat Stress Work/Rest required ☐ Continuous Monitoring ☐ Passive (4 Gas) ☐ Active ☐ Conflicting Work Mitigated ☐ Other ☐		

Additional Precautions: First Aid on CAG + Flare Bld.
OPS present for each break.

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Acid Gas Blind Removal

- Boilermakers put on supplied air respirators with escape bottles and climbed to the platform to work on Blind 407
- Boilermakers saw two identical piping segments located 5 feet apart—one contained acid gas on ARU7
- Did not see a **blind tag** but did see a **flange-locking device** on ARU7, so they falsely believed it was the location of Blind 407
- Blind 407 tag was on the railing above the platform, and they did not see it

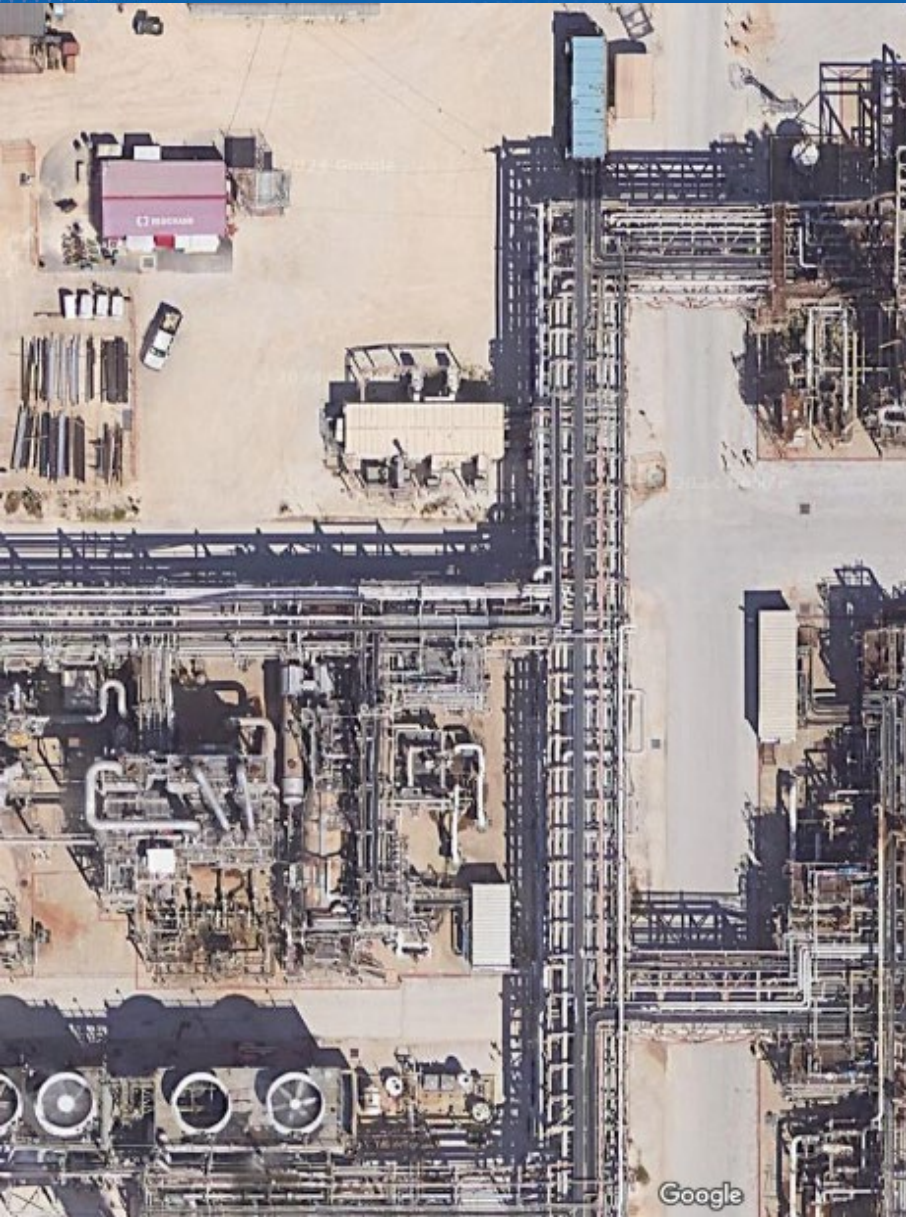


Hydrogen Sulfide Release and First Fatality

- Believing that they were working on Blind 407, the boilermakers removed bolts from the ARU7 flange
- At 4:23 p.m., the flange opened and released **toxic hydrogen sulfide**
- One boilermaker disconnected his air hose, but inhaled hydrogen sulfide and collapsed several feet away
 - The fatally injured boilermaker was found with his respirator mask removed, lying next to him
 - The respirator regulator was found set to continuous flow
 - The escape bottle was empty at the conclusion of the incident
- The other boilermaker safely escaped the release

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Downwind Impact and Second Fatality

- Wind carried the hydrogen sulfide into the nearby Sulfur Unit – portable alarms activated
- ISC worker 250 feet downwind was unable to escape and was fatally injured
- Other contractors heard alarms and evacuated to the primary assembly point
- 47 contractors from 10 companies were evaluated for hydrogen sulfide poisoning; an additional 13 contract workers were taken to medical facilities
- The sitewide alarm sounded 12 minutes after the release began.
- An hour after the release began, emergency responders bolted the flange, stopping the leak.

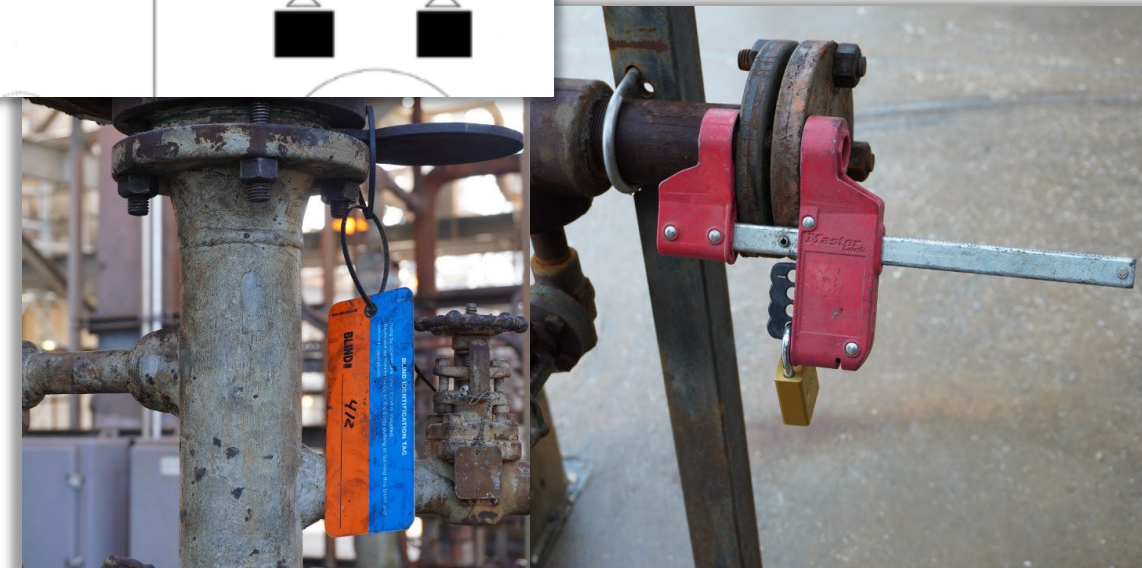
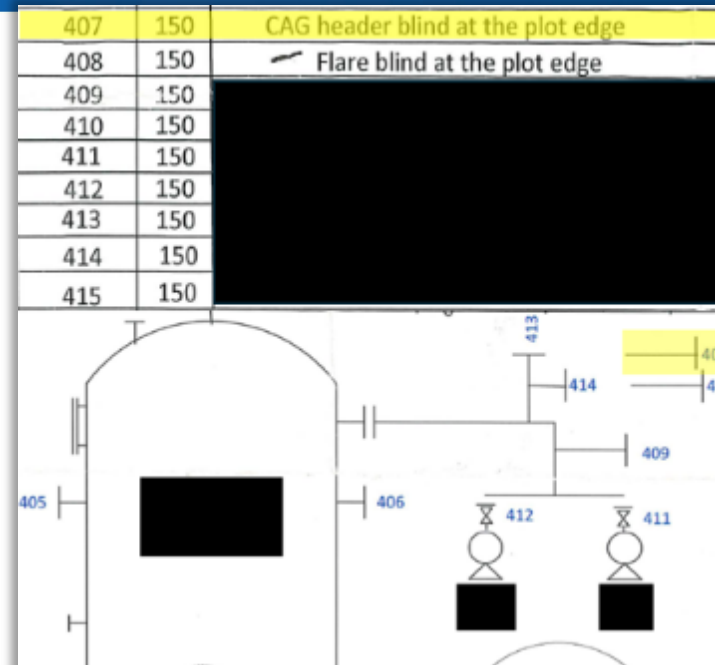
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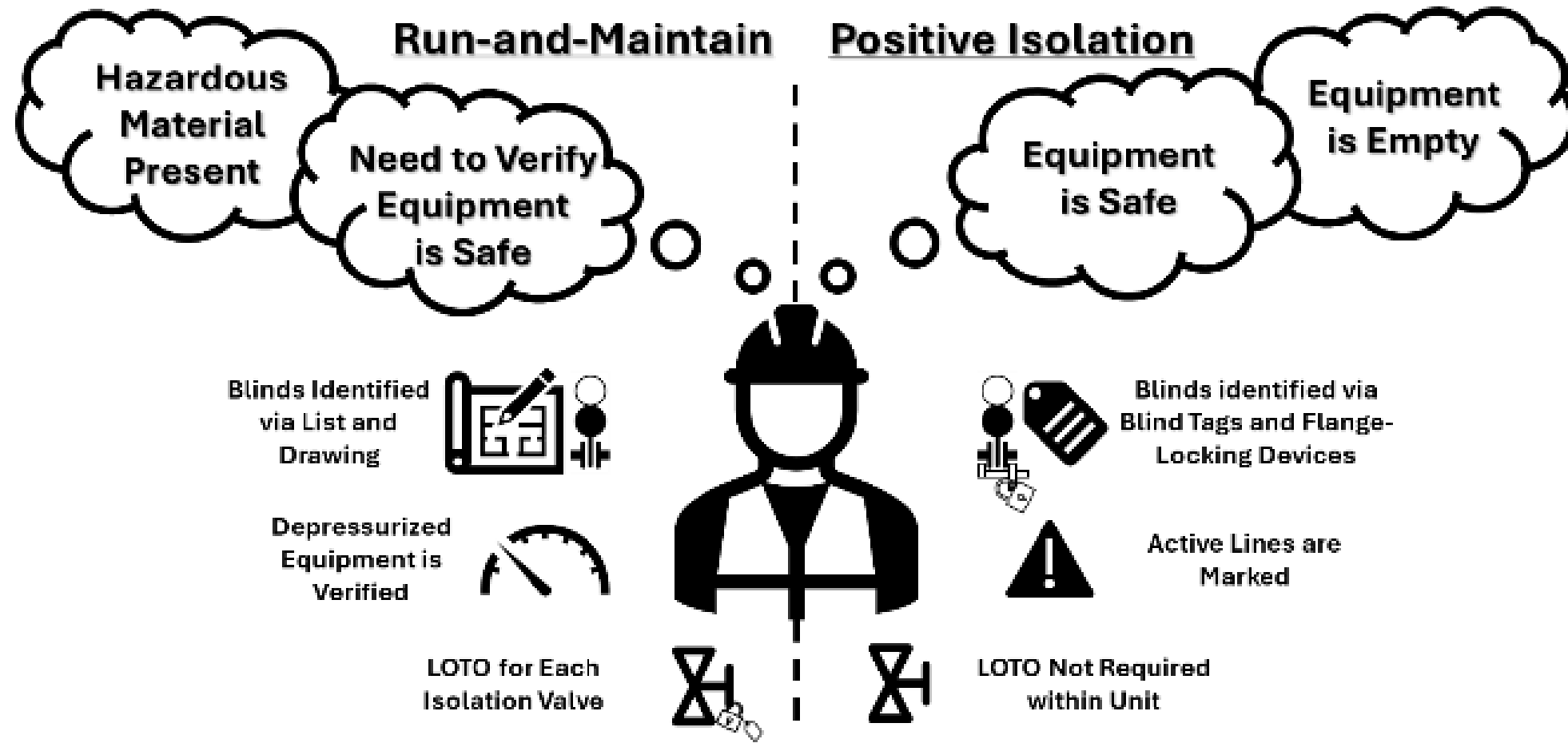
Lessons Learned

- PEMEX Deer Park expected Repcon to follow a drawing and a list, which was unhelpful and not used
- Improvised Methods
 - To aid the contractors, operators hung **blind tags** on flanges
 - The tag for the intended flange was placed out of sight
 - Nightshift Repcon workers installed **flange-locking devices**
 - Dayshift Repcon looked for unlocked **flange-locking devices**

What could have been different?



Lessons Learned



What could have been different?

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Post-Incident Improvements

BLIND LOCATION TAG

- Hung by operations to identify the locations where the blinds will be installed.

- Removed by operations when the blinds are turned or pulled.

Equipment # _____, Blind # _____

BLIND LOCATION TAG

This side of the tag should be filled out during the Joint Job inspection for installing blinds

JJI, Date: _____

Operator Leading JJI: _____

Craft Worker Installing Blind: _____

BLIND IDENTIFICATION TAG

Hung by operations when blind is installed
Removed by maintenance or the party pulling or turning this blind and return to operations.

Equipment # _____ BLIND # _____

Complete during Joint Job Inspection for removing blinds

JJI Date: _____, Operator: _____

Craft Removing Blind: _____

ATTENTION

THIS AREA FALLS UNDER S-114 ENERGY ISOLATION
AND S-102 PERMITTING PROCESS

This area is **not protected by PIS blinds** - use caution when breaking into the process. **Only locked-out** lines have been properly cleaned and prepared for maintenance.

OPENING THE WRONG LINE CAN BE HAZARDOUS

Requirements:

- S-114 lockbox is required.
- All energy sources **MUST** be isolated, locked, and tagged.
- Operations and Crafts **MUST** verify the equipment is energy-free.
- Intrusive work requires a **Long Form A or B permit** with a permit verifier.
- The **Permit Issuer** and **1st Designated Craft** **MUST** walk out and sign off on **ALL** isolation points.



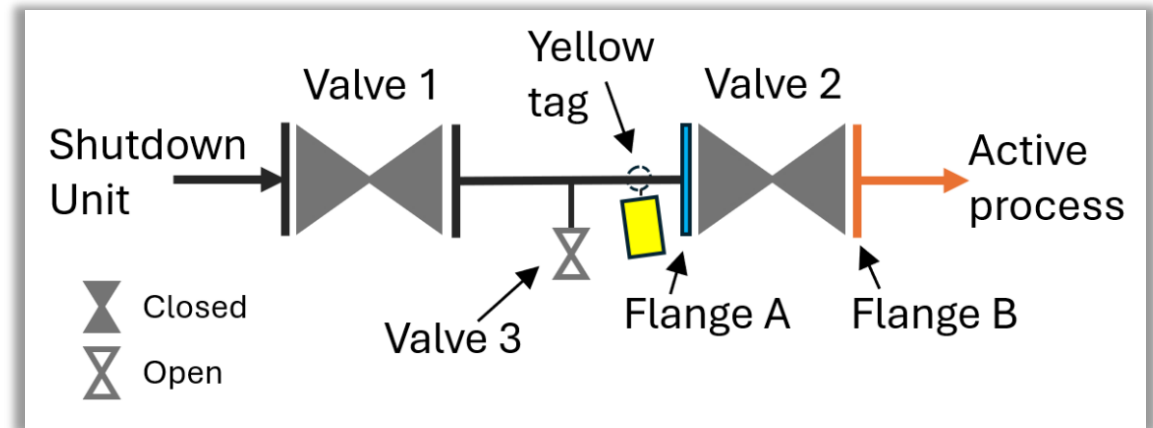
Incident Summary (Volume 4 – Event #12)

- An explosion and fire caused \$924 million in property damage
- Contract workers inadvertently opened a pipe flange that was connected to an active process
- The released flammable material ignited and resulted in a large fire
- The workers had not been trained on the refinery's tagging system used to identify which flange should be opened
- Neither the workers' supervisor nor a unit operator was present when the flange was disassembled



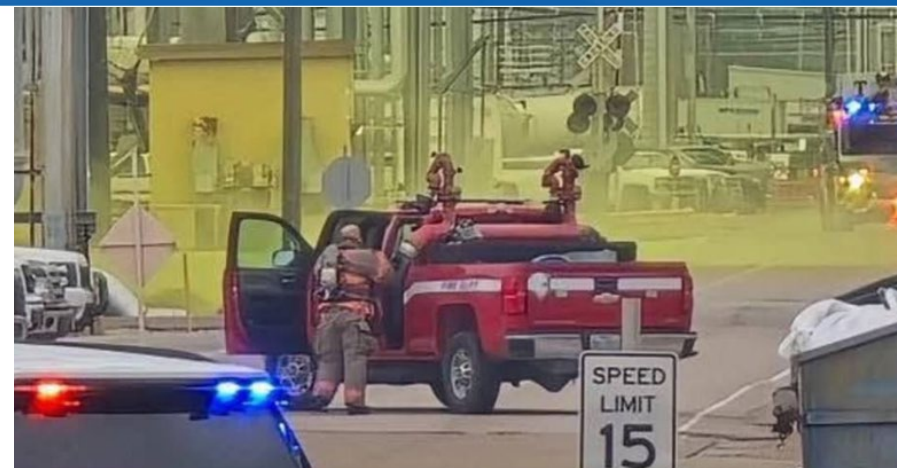
Lessons Learned

- A laser pointer was used to identify the flange to open during the field walk-throughs with the operator, contract crew, and the contractor's supervisor
- PBF Energy expected workers to identify the flange to be opened with a yellow tag
- This “first break” into the system required the presence of a qualified operator
- Due to miscommunication between the workers, the operator was not present
- The contract workers also didn't apply their own locks to valve 1 or valve 2 as part of the equipment isolation phase



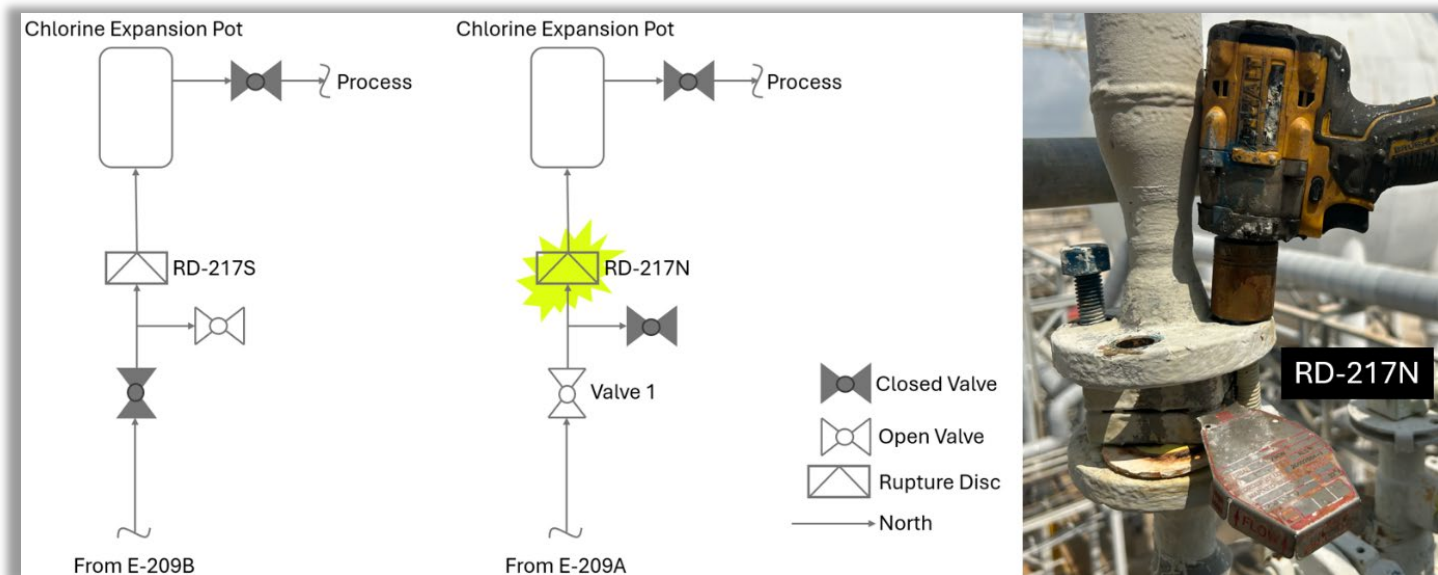
Incident Summary (Volume 4 – Event #13)

- Chlorine release seriously injured one worker, triggered a shelter-in-place for the community, and caused \$23 million in property damage
- A maintenance worker disassembled a rupture disc holder in an active chlorine system, releasing approximately 8,000 pounds of toxic chlorine gas
- Olin's operations team had mistakenly isolated, cleared, and tagged a different but nearly identical piping system and did not isolate, clear, or tag the piping associated with the rupture disc that the maintenance worker disassembled



Lessons Learned

- Contractor workers received a work package and a permit to replace the RD-217N rupture disc
- Olin's operations team had isolated, cleared, and tagged RD-217S
- The unit operator that issued the permit and the contract workers did not perform a field walkthrough of the job
- The contractor crew did not review or sign the equipment isolation plan or the identification tag for the rupture disc holder



Recommendations

To PEMEX Deer Park

- **2024-05-I-TX-R1**
 - Label all piping in ARU6 and ARU7 in accordance with ANSI/ASME A13.1 *Scheme for the Identification of Piping Systems*.
- **2024-05-I-TX-R2**
 - Develop Procedures to ensure that any craftworkers introduced to or removed from a unit in Positive Isolation Status receive instructions that define the hazards, safeguards, and requirements of the unit associated with the work. The procedures should require each craftworker to receive clear communication on the identified hazards, controlled measures, and all other requirements before commencing work in the new area.
- **2024-05-I-TX-R3**
 - Establish a conduct of operations system that establishes and enforces behavioral and performance metrics in accordance with CCPS's *Conduct of Operations and Operational Discipline*.

To the American Society of Mechanical Engineers (ASME)

- **2024-05-I-TX-R4**
 - Develop written guidelines for marking equipment for opening. The guidelines should define a standard practice for equipment marking that includes clear identifiers of the area to be opened and means to remove the markings at the conclusion of the work.

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QUESTIONS?



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