EPA United States Environmental Protection Agency

**Region 6 - Enforcement & Compliance Assurance Division**

# INSPECTION REPORT

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|---|---|---|
| Inspection Date(s): | 12/12 - 16/2022 | |
| Media Program: | Air | |
| Regulatory Program(s) | RMP | |
| | | |
| Company Name: | The Premcor Refining Group Inc. | |
| Facility Name: | Valero Refining – Texas, L.P., Texas City, Texas | |
| Facility Physical Location: | 1201 Loop 197 South | |
| (city, state, zip code) | Texas City, Texas 77590 | |
| Mailing address: | 1201 Loop 197 South | |
| (city, state, zip code) | Texas City, Texas 77590 | |
| County/Parish: | Galveston | |
| Facility Phone Number | (409) 948-7298 | |
| Facility Contact: | Patrick Passantino | Environmental Manager |
| | Patrick.Passantino@valero.com | |
| | | |
| FRS Number: | 110032911669 | |
| Identification/Permit Number: | | |
| Media Identifier Number: | RMP 1000 0010 7886 | |
| NAICS: | 32411 | |
| SIC: | 2911 | |

| Personnel participating in inspection: | | |
|---|---|---|
| Kayla Buchanan | U.S. EPA Region 6 | Inspector |
| Amy Federoff | ERG, U.S. EPA HQ | Inspector |
| Mark Briggs | ERG, U.S. EPA HQ | Inspector |
| Ervin Polasek | Valero | PSM Manager |
| Patrick Passantino | Valero | Environmental Manager |
| Brian Clark | Valero | Safety Manager |
| Rich Vincent | Valero | Operations Superintendent |
| Jared Nysetvold | Valero | Reliability Engineer |
| Gregory Gwin | Valero | Rotating Equipment Manufacturer |
| Monica Davis | Valero | Supply Chain Manager |
| Wale Olanrewaju | Valero | Reliability Manager |
| Johnnie Guzman | Valero | Console Operator |
| Christian Parrabo | Valero | Console Operator |
| Steve Garza | Valero | Console Operator |
| Robert Mayton | Valero | PCMS Admin./Inspection Planner |
| Danny Mancuso | Valero | Chief Inspector |
| Mark Suyama | Valero | Executive Director Process Safety |

| | | |
|---|---|---|
| EPA Enforcement Officer Signature/Date | CARLOS FLORES Digitally signed by CARLOS FLORES Date: 2023.11.15 06:19:39 -06'00' | |
| | {Enforcement Officer name} | Date |
| | | |
| Supervisor Signature/Date | SAMUEL TATES Digitally signed by SAMUEL TATES Date: 2023.11.15 10:35:11 -06'00' | |
| | {Supervisor name} | Date |

**US EPA REGION 6**
**CLEAN AIR ACT SECTION 112(r)**
**INSPECTION REPORT**

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|---|---|
| **Stationary Source** | Valero Refining – Texas, L.P., Texas City, Texas |
| **Date of Inspection** | 12–16 December, 2022 |
| **USEPA Contact** | Kayla Buchanan, U.S. EPA Region 6 |
| **Description of Activities** | Inspection included the following activities:<br>• Opening conference with facility representatives<br>• On-site document review<br>• Field verification<br>• Personnel interviews<br>• Closing meeting with facility representatives |
| **Inspection Participants** | U.S. EPA<br>• Kayla Buchanan, Region 6<br><br>ERG<br>• Amy Federoff<br>• Mark Briggs |
| **Facility Participants** | Ervin Polasek, PSM Manager |
| | Patrick Passantino, Environmental Manager |
| | Brian Clark, Safety Manager |
| | Heath Oxley, Fire Chief |
| | Rich Vincent, Operations Superintendent |
| | Jared Nysetvold, Reliability Engineer |
| | Gregory Gwin, Rotating Equipment Manufacturer |
| | Monica Davis, Supply Chain Manager |
| | Wale Olanrewaju, Reliability Manager |
| | Bonnie Napoli, Senior Technical Trainer |
| | Johnnie Guzman, Console Operator |
| | Christian Parrabo, Console Operator |
| | Steve Garza, Console Operator |
| | Tony Andrade, Backup Console Trainer |
| | Robert Mayton, PCMS Administration/Inspection Planner |
| | Danny Mancuso, Chief Inspector |
| | Mark Suyama, Executive Director Process Safety |

## Stationary Source Information

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|---|---|
| **USEPA Facility ID #** | 1000 0010 7886 |
| **Most Recent Submission** | 29 May 2020 |
| **Facility Location** | 1201 Loop 197 South<br>Texas City, Texas 77590 |
| **Lat / Long** | 29.368952, −94.911332 |
| **Number of Employees** | 500 |
| **Description of Surrounding Area** | The facility is in a mixed-use urban and industrial area. |

## FACILITY/PROCESS DESCRIPTION

The Valero Refining – Texas, L.P. refinery (the Facility, or Valero), located in Texas City, Texas, was founded in 1908. The refinery has had numerous owners since founding and has been owned by Valero since the late 1990's. The Facility covers approximately 500 acres and employs approximately 500 persons. Additional embedded contract employees are also on-site each day to provide additional maintenance and specialty services. The refinery operates 24 hours per day, 7 days per week and follows the Dupont shift schedule for operations. Maintenance employees work Monday through Friday and are available during weekends and holidays as needed. There is no labor union at the refinery.

The Facility has a capacity to process approximately 260,000 barrels per day (bpd) of crude oil into various fuel products such as gasoline, jet fuel, diesel fuel, liquified petroleum gases (LPG), petroleum coke and elemental sulfur. At the time of EPA's inspection, the facility was processing approximately 250,000 bpd of crude oil. The refinery can process light, medium and heavy crude stocks including those containing high sulfur levels (sour crude). Crude is delivered to the refinery via pipeline or vessel. Hydrogen is delivered to the refinery via pipeline from Linde for use in various processing units. Gasoline, diesel, and naphtha products are sent off-site by pipeline or vessel. Sulfur is sent off-site by truck and petroleum coke is sent off site by vessel.

The refinery is divided into five total complexes and one administration building. Each complex encompasses multiple operating units. A newly constructed single main control room located on the second floor of the Administration Building allows the entire refinery to be operated remotely. Individual control rooms are located within the refinery near each of their respective operating units and these can be used to control each unit if needed during emergencies or when console operators are not available in the main control room. Individual control rooms within the refinery also provide an area where outside operators are stationed.

The Facility reported 19 RMP covered processes in its most recent RMP submission dated to May 29, 2020, summarized in Table 1 below. Only one processing unit, #3 Crude, is considered a RMP Program Level 1 process. All other operating units at the refinery are Program Level 3. The refinery has five flares that are used for the controlled combustion of excess hydrocarbons from the processing units. A flare gas recovery system (FGRS) is installed ahead of the flares to capture hydrocarbons before combustion so that only excess amounts of hydrocarbons reach the flares. Water for the refinery's fire suppression system and toxic vapor suppression system is

collected from the wastewater treatment plants effluent discharge and stored in an on-site fire water pond. Diesel driven firewater pumps pull water from the pond and distribute the water through the network of firewater piping within the refinery.

**Table 1. RMP Covered Processes for the Refinery**

| Process ID | Process Name | Program Level | Chemical | Quantity (lb.) | Category |
|---|---|---|---|---|---|
| 1000108677 | OMCC – Tank Farm | 3 | Flammable Mixture | 8,4000,000 | Flammable |
| 1000108678 | PPU/LPG Storage | 3 | Propane | 560,000 | Flammable |
| | | | Propylene | 350,000 | Flammable |
| | | | Flammable Mixture | 690,000 | Flammable |
| 1000108679 | HF Alky (Phillips) | 3 | Hydrogen fluoride (conc 50% or greater) | 280,000 | Toxic |
| | | | Flammable Mixture | 420,000 | Flammable |
| 1000108680 | Sat Gas | 3 | Flammable Mixture | 200,000 | Flammable |
| | | | Butane | 19,000 | Flammable |
| 1000108681 | #2 Reformer | 3 | Flammable Mixture | 250,000 | Flammable |
| 1000108682 | Penex | 3 | Flammable Mixture | 420,000 | Flammable |
| 1000108683 | Diesel Hydrotreater (DHT), #2 Amine | 3 | Flammable Mixture | 110,000 | Flammable |
| 1000108684 | Fluidized Catalytic Cracking Unit (FCCU), Gas Con | 3 | Flammable Mixture | 400,000 | Flammable |
| 1000108685 | Rose | 3 | Flammable Mixture | 320,000 | Flammable |
| 1000108686 | #3 Crude, A82 | 1 | Flammable Mixture | 77,000 | Flammable |
| 1000108687 | #1 and #2 Toppers | 3 | Flammable Mixture | 110,000 | Flammable |
| 1000108688 | #1 Amine Unit | 3 | Flammable Mixture | 47,000 | Flammable |
| 1000108689 | Gas Dehydration Unit (GDU) | 3 | Flammable Mixture | 890,000 | Flammable |
| 1000108690 | Delayed Coker Unit (DCU) | 3 | Flammable Mixture | 165,000 | Flammable |
| 1000108691 | LRU | 3 | Flammable Mixture | 175000 | Flammable |
| | | | Butane | 19,000 | Flammable |
| 1000108692 | MDHT | 3 | Flammable Mixture | 110,000 | Flammable |
| 1000108693 | GOHT | 3 | Hydrogen | 15,000 | Flammable |
| | | | Flammable Mixture | 23,000 | Flammable |
| 1000108695 | Treater | 3 | Flammable Mixture | 28,000 | Flammable |
| 1000108696 | LEDHX | 3 | Flammable Mixture | 21,000 | Flammable |

Based on the limited time available for the inspection, the EPA inspection team focused on the following units:

- Hydrofluoric Acid Alkylation Unit (HF Alky) [RMP Process ID 1000108679];
- Fluidized Catalytic Cracking Unit 2 (FCCU) [RMP Process ID 1000108684];
- Diesel Hydrotreater (DHT) [RMP Process ID 1000108683]; and

- Gas-Oil Hydrotreater (GOHT) [RMP Process ID 1000108693].

The EPA inspection team selected these units as they were involved in reported accidents at the Valero Texas City Facility or historical incidents that occurred at other refineries. In April 2018, a pipe ruptured in the HF Alky unit, which caused a fire and the release of HF acid. In August 2022, a tube ruptured on the furnace in the GOHT unit and ignited. The FCCU and DHT were selected due to recent incidents at other refineries in the United States with similar operations.

## PURPOSE OF THE INSPECTION

EPA selected the Valero facility for inspection based on its proximity to Environmental Justice (EJ) areas and because of its proximity to Galveston Bay and the potential for flooding. EJ data developed from EPA's EJ Screening and Mapping Tool shows 11 indices in Texas City, TX are ranked between 80 to 100 percent compared to the rest of the United States. Elevation data shows that parts of the refinery are as low as 3 meters above sea level and during major storm events such as hurricanes. For this reason, storm surge combined with heavy rainfall could flood the processing areas resulting in potential loss of containment of toxic chemicals as well as refinery fires.

The inspection of the Valero refinery occurred between December 12, 2022 through December 16, 2022 and focused on the Facility's implementation of and compliance with the requirements under CAA § 112(r) Risk Management Plan, EPCRA §§ 302-312, and CERCLA § 103. While at the refinery, the inspection team performed a field walkdown of the HF Alky, FCCU, DHT and GOHT processes, conducted interviews with refinery representatives, and requested documents for review regarding each unit.

In preparation for the inspection, Kayla Buchanan of U.S. EPA Region 6 sent an electronic notice of inspection and request for information (RFI) to the Valero Vice President and General Manager, on November 30, 2022. The RFI included a list of documentation that the inspection team intended to review upon their arrival at the Valero refinery on December 12, 2022. The EPA correspondence to Valero also requested that Valero inform employee representatives of the inspection and invite them to participate as required by CAA § 112(r)(6)(L). The Valero Environmental Manager confirmed the receipt of the notice of inspection on behalf of the Valero Texas City refinery on December 5, 2022.

## OPENING MEETING

Inspector Buchanan initiated the opening meeting at approximately 9:40 am on Monday, December 12, 2022, by introducing the members of the inspection team and explaining the purpose and scope of the inspection. She discussed the expected logistics of each day, which included interviews with personnel, documentation requests, a driving tour of the entire refinery, and walkthroughs of the HF Alky, GOHT, and DHT processes. The opening meeting included Valero representatives who also participated throughout the inspection.

## INSPECTION OVERVEIW

Valero representatives provided a brief overview of the entire refinery as well as specific details about the operation of the HF Alky, FCCU, and DHT processes. The Facility coordinated a

driving tour of the entire refinery to allow the inspection team to become familiar with the physical layout and equipment within the refinery. The inspection team met with multiple personnel to discuss the implementation of and compliance with the requirements under CAA § 112(r) Risk Management Plan, EPCRA §§ 302-312, and CERCLA § 103 with respect to the operation and maintenance of each unit. The inspection team also completed walkthroughs of the HF Alky, DHT and GOHT processes.

While on-site, the inspection team requested additional documentation to support the Facility's implementation of the applicable requirements of CAA § 112(r) Risk Management Plan, EPCRA §§ 302-312, and CERCLA § 103 at each of the selected operating units. The Inspection Document Review/Request List (see Attachment 1) recorded each document identified for further review by the inspection team. The inspection team provided a copy of the document request list to Valero at the conclusion of the inspection. Valero personnel indicated they would provide documentation responsive to this follow-up request within 30 days.

## FIELD OBSERVATIONS

Around 1:30 pm on Monday, December 12, 2022, refinery representatives provided a driving tour of the entire refinery to the EPA inspection team. On Wednesday, December 14, 2022, refinery representatives escorted EPA inspectors to the HF Alky battery limits, within the DHT unit, and to the reactor in the GOHT unit that experienced the August 2022 fire. During the December 14, 2022 walkthrough of these units, EPA inspectors took a total of 23 photographs of processing equipment. Valero has claimed all photographs taken during the inspection are confidential business information (CBI) and therefore are not provided as attachments to this report. Observations made during the walkthrough of the processing units include:

- Piping within the HF Alky and DHT units were not sufficiently labeled to indicate the contents or direction of flow.

- Foundations used to support the main fractionation reboiler tower in the HF Alky unit and foundations used to support heat exchangers 1293 and 1294 in the DHT unit had missing and broken concrete.

## DOCUMENTATION REVIEW

Valero representatives provided documentation to the EPA inspection team related to implementation of the refinery's RMP program throughout the inspection. The following provides a summary of the documentation provided and reviewed during the inspection as well as documentation sent to EPA post-inspection in response to the document request list.

### 40 CFR § 68.10 – Applicability

Valero prepared a list of 38 units or processes at the refinery and the specific rational for why each unit was or was not defined as a RMP process. Rational included the amount of flammable materials or toxic chemicals in the process relative to the RMP regulatory threshold quantities (See Bates No. VALERO-TC-EPA-RMP-000027 through 000029). Review of the list indicates Valero included both hydrogen sulfide and hydrofluoric acid in their applicability analysis for toxics; however, aqueous ammonia was not included. According to the refinery's RY 2020 and

2021 EPCRA Tier II reports, the refinery stores between 75,000 and 99,999 pounds (lbs.) of 31% w/w aqueous ammonia to control nitrogen oxide emissions in different processes. Facilities having more than 20,000 lbs. of aqueous ammonia (20% w/w or greater) should include this toxic substance in their RMP program.

The inspection team has identified Areas of Concern (AOCs) at the end of this inspection report for this program element.

**40 CFR § 68.15 - Management Systems**

Valero developed a management system to oversee implementation of the RMP elements that assigns a qualified RMP/PSM coordinator supported directly by the Plant Manager as well as other corporate RMP/PSM staff at Valero's San Antonio corporate headquarters. An organizational chart shows the positions responsible for the RMP elements and the reporting structure to the RMP coordinator and the Plant Manager (See Bates No. VALERO-TC-EPA-RMP-000032).

**40 CFR § 68.22 - Offsite Consequence Analysis**

The Facility used EPA's RMP*Comp program to model Worst-Case Scenarios (WCSs) and alternative release scenarios (ARSs) for toxics from covered processes. The Facility modeled and reported one toxic WCS for a release of hydrogen fluoride (HF) from the HF Alky (RMP Process ID 1000135812) as well as one ARS for a HF transfer hose failure. Valero did not assume any mitigation measures when calculating the distance to endpoint for either the worst-case or alternative-case scenarios (See Bates No. VALERO-TC-EPA-RMP-000033 through 000052).

For modeling potential releases of flammables from covered processes, the Facility again used EPA's RMP*Comp program to model both WCSs and ARSs. The Facility modeled multiple WCSs for releases of flammables from various processing units to select the scenario that resulted in the largest distance to endpoint. The two vapor cloud explosions that resulted in the largest distance to endpoint were from a Program Level 3 process (the OMCC Tank Farm, RMP Process ID 1000108677) and a Program Level 1 process (the #3 Crude, A82, RMP Process ID 1000108686). The flammables ARS was based on a vapor cloud explosion from the PPU/LPG Storage (Program Level 3, RMP Process ID 1000135811) (See Bates No. VALERO-TC-EPA-RMP-000033 through 000052).

EPA requested Valero provide supporting documentation regarding the methodology used to define off-site impacts to both populations and environmental receptors and was provided with various release scenarios that included rational for selection, distances to endpoints and population densities based on the 2010 Census data (See Bates No. VALERO-TC-EPA-RMP-000053 through 000057). Valero provided environmental receptor information in their documentation transmittal letter to EPA dated January 13, 2023, that listed two environmental receptors (See Item No. 19); however, no documentation was provided to indicate how these receptors were determined or their data sources.

The inspection team has identified an Area of Concern (AOCs) at the end of this inspection report for this program element.

## 40 CFR § 68.42 – Five Year Accident History

Valero reported one accident in their May 2020 RMP submittal. The accident occurred in the HF Alky unit on April 19, 2018, and resulted in a fire and the release of 974 pounds of hydrofluoric acid. The incident was reported to EPA's National Response Center (Sequence No. 1209786) at 18:32 on April 19, 2018, less than two-hours after the incident began. The accident injured one employee and resulted in $84 million dollars in on-site property damage. No off-site receptors were reportedly impacted by the accident. Further information regarding the accident is included in the Incident Investigation section of this report.

On August 18, 2022, a tube rupture in the Treat Gas Furnace in the Gas Oil Hydrotreater (GOHT) caused the release of hydrogen and hydrocarbon feed that ignited and caused a fire and equipment damage. The tube rupture and resulting fire occurred at approximately 3:45 am and by 5:15 am the fire was controlled, and the unit was secured. There were no injuries associated with the event. According to the incident investigation report, "agency notifications were timely made, and Valero promptly convened an investigation team." However, the search results of EPA's Emergency Response Center database for 2022 did not include a call from Valero in August 2022 related to the fire in the GOHT Treat Gas Furnace.

## 40 CFR § 68.65 - Process Safety Information (PSI)

Valero maintains process safety information for the entire refinery on their intranet site that is accessible by all employees. Process safety information includes block flow diagrams of each process unit, piping and instrumentation diagrams (P&IDs) of each process unit, a description of safety systems including fixed water suppression systems for firefighting and chemical releases, safety data sheets (SDS) for all chemicals used on site, design information for safety relief valves, operating envelopes for various parameters (e.g., temperature and pressure) as well as consequences of operating outside the envelopes. During the inspection, block flow diagrams of the HF Alky, FCCU and DHT units were requested along with specific P&IDs to ensure accuracy by field verification. Formal documentation showing the operating envelopes and consequences of deviations for the HF Alky, FCCU and DHT units were also requested and reviewed to verify consistency with set points and alarms in the console control system and to verify that steps undertaken to correct deviations were consistent with operating procedures.

Review of the documented operating envelopes for the heat exchangers associated with the DHT found the listed operating temperatures for E-1290/91/92 Stripper Still Bottoms and E-1293/94/95/96 Effluent Reactor Feed were above the design temperatures for the equipment (See Bates No. VALERO-TC-EPA-RMP-000437). To determine if this equipment was actually operating above the equipment design temperatures, EPA inspectors reviewed the historical operating temperature trends for this equipment with the Valero console operators and found the actual operating temperatures is below the design temperatures of the equipment. Inspectors also verified with the Valero console operators that the temperature alarm set points are below the temperature design limits for the equipment. The documented operating envelopes provided to the EPA inspectors (See Bates No. VALERO-TC-EPA-RMP-000437) were determined to be incorrect.

The inspection team has identified AOCs at the end of this inspection report for this program element.

**40 CFR § 68.67 - Process Hazard Analysis (PHA)**

The refinery conducts both initial and revalidation PHAs according to their PHA procedure dated July 1, 2014 (See Bates No. VALERO-TC-EPA-RMP-000363 through 000389). The PHA procedure includes an option for conducting PHAs using either a Hazard and Operability Study (HAZOP), What-if Analysis or Checklist Analysis methodologies and includes guidance related to the need to conduct P&ID reviews to verify accuracy, how to develop the PHA schedule, and how to choose appropriate PHA team members. Valero contracts with BakerRisk to facilitate PHAs at the refinery. The PHA procedure includes requirements to analyze each possible deviation to identify any credible causes and significant consequences. The severity of a deviation, without the engineering design and procedural safeguards, is ranked on a scale from 1 to 4. The safeguards that are in place to control any hazardous consequence of the deviation are identified and the likelihood of an incident occurring is ranked on a scale from A to E. The severity and likelihood are then combined into a risk ranking using a matrix. If the consequence is determined to be a significant hazard and the existing safeguards are deemed insufficient to control the hazard, recommendations are made to improve safety.

EPA requested and received the two most recent PHAs for the HF Alky, FCCU, and DHT processes as well as the status of any recommendations made from these PHAs. The dates these most recent PHAs are:

- HF Alky: February 2016 and February 2021
- FCCU: December 2016 and November 2021
- DHT: July 2016 and June 2021

The number of recommendations from each of these PHAs as well as their status at the time of EPA's inspection in December 2022 are shown in the table below (See Bates No. VALERO-TC-EPA-RMP-004361 to 004363).

| Unit | Total 2016 PHA Recommendations | Unresolved 2016 PHA Recommendations and Target Due Dates | Total 2021 PHA Recommendations | Unresolved 2021 PHA Recommendations and Target Due Dates |
|---|---|---|---|---|
| HF Alky | 8 | 4<br>October 31, 2023 or next TA | 9 | 2<br>April 30, 2024 |
| FCCU | 2 | None | 6 | 5<br>April 1, 2024 |
| DHT | 10 | None | 2 | None |

*TA: Turn around*

The table above shows the HF Alky has four recommendations from the 2016 PHA with target due dates of October 31, 2023, more than seven years after the initial recommendations were made. The HF Alky has two additional recommendations from the 2021 PHA with target resolution dates of April 30, 2024, more than 3 years after the initial recommendations were made.

Review of the residual risk rankings for the four unresolved HF Alky PHA recommendations from 2016 found that two have a residual risk ranking of 2 because the consequences are a potential release of flammables resulting in a flash fire/explosion and personnel injury (See VALERO-TC-EPA-RMP-004137 and 004138). According to Table 3 in the HF Alky PHA, a finding that has been assigned a residual risk ranking of 2 or 3 requires an evaluation of recommendations provided by the PHA team and implementation of those recommendations, as appropriate. One of these action items (Action Item Number 4058172) requires installation of a pressure transmitter at the combined inlet line of the Feed Dryers (D-394, D-395) with high pressure alarm at the control console. The second action item (Action Item 4058173) requires configuring the feed bypass FV-7106 to open on high pressure upstream of the Feed Dryers (D-394, D-395). The HF Alky is on a 5-year turn around (TA) schedule, as indicated by Facility personnel at the time of the inspection. Therefore, the next TA following completion of the 2016 PHA should have occurred no later than 2021. In addition, an incident occurred in the HF Alky unit in 2018 that required the entire unit to be taken out of service for repair, which was a time period during which installation of this equipment could have occurred. Not installing the recommended equipment to alleviate an elevated risk for nearly seven years after it was first identified in a PHA does not qualify as resolving recommendations in a timely manner, as required.

The two unresolved recommendations from the February 2021 HF Alky PHA were set with target resolution dates of April 30, 2024, and these also were assigned residual risk rankings of 2. The first recommendation (Action Item 4119718/4119721) is to install temperature transmitters

at the D-1170/77 KOH bed and a critical interlock to shutdown (i.e., valve isolation) feed to the D-1170/77 KOH bed on high differential temperature (See Bates No. VALERO-TC-EPA-RMP-004363). The second recommendation (Action Item 4119726) is to install a temperature transmitter at the D-403 KOH bed and a critical interlock to shutdown (i.e., valve isolation) feed to the D-403 KOH bed on high differential temperature (See Bates No. VALERO-TC-EPA-RMP-004363). Both recommendations were given a residual risk ranking of 2 due to the potential for overheating and loss of containment, release of HF, potential fire and personnel injury (See Bates No. VALERO-TC-EPA-RMP-004305). Not installing the recommended equipment to alleviate the risk of a fire and HF release for more than 3 years after it was first identified in the PHA does not qualify as resolving recommendations in a timely manner, as required.

The 2021 PHA revalidations for the HF Alky, DHT and FCCU include Facility Siting Checklists that pose a series of questions to determine if the existing containment, equipment layout/placement, and access/egress is adequate to address various deviations. For each of the PHAs the deviation associated with containment asks the question, "Is the process designed such that it is not susceptible to flooding from stormwater or firewater run off such that the risk is acceptable?" and in each PHA revalidation the response is "Yes" without any further explanation (See Bates No. VALERO-TC_EPA-RMP-004266).

Node 26 in the HF Alky revalidation PHA includes high rain amounts/flooding as potential causes for deviations. The PHA states the consequences of high rain amounts and flooding are "Potential for high rain, but drainage in associated units is sufficient and elevation is high, so flooding is not typically expected unless the entire plant is flooded. Potential operations upset, loss of power, etc. Potential personnel injury. Safety scenario only if operator is outside during excessive weather" but no safeguards are provided (See Bates No. VALERO-TC-EPA-RMP-004275). Comments in the PHA indicate no recommendations are needed since the risk is acceptable. Identical deviations, causes and consequences are provided in the DHT and FCCU PHA revalidations and neither of these have safeguards for high rain amounts/flooding either.

The Valero Texas City refinery is located in a coastal area along Galveston Bay which has an increased risk of flooding during intense storms and hurricanes that can be exacerbated by climate change. Although the PHA states "…drainage in associated units is sufficient and elevation is high so flooding is not typically expected unless the entire plant is flooded," the hazard associated with flooding of the processing units is not being mitigated with engineering controls.

The inspection team has identified AOCs at the end of this inspection report for this program element.

**40 CFR § 68.69 - Operating Procedures**

The refinery has developed written operating procedures (termed operating manuals by Valero) for each of the refinery operating units that include written instructions to safely startup, shutdown, and maintain normal operations. Operating procedures also include steps for emergency situations and a summary of relevant safety and health considerations. Valero maintains a procedure for preparing operating procedures in a written step wise format and reviewing and modifying the procedure prior to initiation to reflect any specific conditions, or

work being performed on the unit (See Bates No. VALERO-TC-EPA-RMP-000406 through 000413). Valero has also developed separate safety procedures, covering all operating units, for entering confined spaces and controlling energy sources including electrical, mechanical, hydraulic, and pneumatic (i.e., lockout /tagout).

Operating procedures are maintained electronically on the Valero intranet site as well as in hard copy in the main control room. Console operators review written operating procedures with field operators prior to beginning an activity and field operators are in constant contact with main control room while completing an activity for step-by-step instructions via radio, if needed. According to console operators, all emergency procedures and procedures used "on a regular basis" are recertified annually.

**40 CFR § 68.71 - Training**

Valero has developed a corporate wide Basic Operator Training (BOT) program for all new potential refinery operators. BOT is a 10-week course provided by the refinery's Technical Training Department that covers an overview of the refinery and the various operating units, safety systems, and equipment. During the 10-week BOT, the 10 to 20 new prospective operators are in a classroom-type setting and are given written examinations following each module to assess the individuals' progress. Following the 10-week BOT course, individuals are evaluated and those having the potential to become an operator are assigned to a specific operating unit where they are given a unit-specific training plan and paired with a unit-specific trainer. During unit-specific training, the individual completes various written modules as well as shadows the trainer to learn the specific tasks and associated operating procedures for their duties. Unit-specific written examinations are given throughout unit training to measure progress. Once training is complete, the individual is given the position as an Operator B (outside operator).

Employees having an Operator B (outside operator) position can request to become a console operator (Operator A). During the training period to become a console operator, which can take up to 12 months, prospective operators are not required to perform their outside Operator B duties but instead shadow their assigned console operator trainer. Written testing is required as well as recommendations from their console operator trainer to become a console Operator A.

All A and B Operators are required to complete 3-year refresher training. Refresher training is provided on-line through the refinery's intranet site and requires employees to log into the training and complete refresher examinations. To ensure operators complete their training prior to the 3-year requirement, the Technical Training Department sends a 90-day look ahead email to the operators to remind them their refresher training is due. Refresher training exam questions specific to the operating units are developed by the unit supervisors in consultation with the Technical Training department.

**40 CFR § 68.73 - Mechanical Integrity**

Valero developed a mechanical integrity inspection manual specific to Texas City to document the system, procedures, programs and work instructions for inspection of fixed equipment located within the refinery (See Bates No. VALERO-TC-EPA-RMP-000444 through 000463). Inspection of fixed equipment is performed by a team of API 510/570 inspectors and inspection data is entered into the Plant Condition Management Software (PCMS). Inspections for

approximately 90 percent of the fixed equipment in the refinery follows a Risk Based Inspection (RBI) approach that defines the risk of operating equipment that considers the probability and consequences of failure (criticality rating) as well as the underlying damage mechanisms. The criticality rating and damage mechanism(s) determine the specific inspection strategy and inspection plan for a piece of equipment. The RBI frequency for on-stream non-destructive evaluation (NDE) inspections of pressure vessels and piping is determined by the corrosion rate and the predicted remaining equipment life calculated by the PCMS RBI program.

Rotating equipment inspections performed on pumps, compressors, fixed fans, and turbines are performed on a time-based frequency per the manufacturers' recommendations and the refinery's historical inspection data. Inspections include bi-annual vibrational testing performed by Valero inspectors as well as loop checks performed by Valero instrumentation and electrical (I&E) technicians to verify system cut-outs will activate when operating limits are exceeded. Deficiencies identified by the rotating equipment inspectors or I&E technicians are provided to the rotating equipment engineers who alert the operators in the unit where the equipment is located to submit a work order in the SAP system for maintenance to address. Valero's corporate mechanical integrity program also provides the refinery with a list of "bad actors" regarding rotating equipment which help prioritize inspection and maintenance frequency that is used in the SAP system to develop work orders.

*Mechanical Integrity Documentation – DHT and Associated Equipment*

Mechanical integrity documentation was reviewed in comparison to Valero's facility-specific maintenance and inspections practices as defined in the Facility's mechanical integrity inspection manual. Specific documentation regarding equipment associated with the DHT covered process and the potential for high-temperature hydrogen attack (HTHA) included the following:

- DHT P&IDs with corrosion mechanism circuits and corrosion zones;
- HTHA Summary Spreadsheet Updated April 2021;
- Visual, non-intrusive, and on-stream inspection documentation for DHT Piping Circuits 18-6'-60CHO-032-2 and 18-6'-60CHO-031-3 (non-chromium alloy piping); and
- Visual, non-intrusive, on-stream and internal inspection documentation for DHT Vessels E-1294 and E-1293 including vessel U1 forms.

Corrosion Model Diagrams provided for the DHT have color coded both piping circuits and pressure vessels to show materials of construction for each component within the system. Based on the Corrosion Model Diagram for the DHT (See VALERO-TC-EPA-RMP-003465), process piping and pressure vessels are stainless steel after the reactor feed/effluent heat exchangers in contact with hydrogen and hydrocarbons. Carbon steel piping is used for water service, recycle gas, stripper bottoms and sour gas effluent.

Comparing the piping materials shown on the Corrosion Model Diagram around vessel D-756 recycle gas amine contactor knock-out drum (See Bates No. VALERO-TC-EPA-RMP-003466), indicates the piping and vessel materials are two different types. Piping used to transfer sour gas from D-752 to D-756 is of carbon steel construction. Piping used to transfer sour gas from D-756

to A-170 is also carbon steel construction. However, vessel D-756 is chrome alloy steel containing 1.25% chromium. Damage mechanisms indicated on the Corrosion Model Diagram for vessel D-756 include wet hydrogen sulfide corrosion, sour water corrosion, and external corrosion for carbon and low alloy steels. Sour gas entering and leaving the D-756 knockout drum likely has the same hydrogen sulfide content as inside the drum and therefore the piping should also be chrome alloy steel.

According to National Association of Corrosion Engineers (NACE) International Standard MR0103 (2005)[1] Section 1.3.3.1, sulfide stress corrosion cracking (SSC) has not generally been a concern for carbon steels typically used for refinery pressure vessels and piping in wet hydrogen sulfide service because these steels have sufficiently low hardness levels. However, improperly heat-treated materials, weld deposits, and heat-affected zones (HAZs) may contain regions of high hardness. If any of these concerns cannot be resolved and documented, Valero should have been using chrome alloy steel piping containing 1.25% chromium instead of carbon steel for transferring sour gas to and from vessel D-756.

Valero's contractor performed an on-stream non-destructive evaluation (NDE) of piping circuit number 60CHO-031-MPF Hydrogen on February 4, 2021, to locate and evaluate indications that could be indicative of HTHA on this piping circuit and to determine the extent of these indications (See Bates No. VALERO-TC-EPA-RMP-004407 through 004431). The inspection did not indicate HTHA was occurring. Valero also performed visual external inspections of DHT heat exchanger E-1293 in 2021. Valero had performed an internal inspection of E1293 in 2018 during catalyst changeout (See Bates Nos. VALERO-TC-EPA-RMP-004477 through 004501). The results from both inspections on heat exchanger E-1293 did not find evidence of HTHA. Valero performed an on-stream inspection of heat exchanger E-1294 in 2020. This was intended to examine metal thinning caused by HTHA and sulfidation corrosion (See Bates No. VALERO-TC-EPA-RMP-004526 through 004529). Ultrasonic thickness testing of more the 40 corrosion monitoring locations (CMLs) on the heat exchanger did not find evidence of metal thinning.

*Mechanical Integrity Documentation – HF Alky and Associated Equipment*

The EPA inspection team reviewed specific maintenance and inspection documentation for the HF Alky unit and the associated release mitigation equipment and included the following:

- Inspection and testing records for wet testing the deluge systems and firewater cannons as well as the calibration records for the HF sensors of the release mitigation systems for the HF Alky;

- HF Alky P&IDs with corrosion mechanism circuits and corrosion zones (See Bates Nos. VALERO-TC-EPA-RMP-001545 through VALERO-TC-EPA-RMP-001565);

- Basic Practice for inspection of fixed equipment for the HF Alky (See Bates Nos. VALERO-TC-EPA-RMP-001399 through VALERO-TC-EPA-RMP-001424);

[1] NACE International Standard MR0103: Materials Resistant to Sulfide Stress Cracking in Corrosive Petroleum Refining Environments (2005)

- Visual, non-intrusive, and on-stream inspection documentation for piping circuits at the inlet and outlet of the HF Alky propane defluorinators D-401 and D-402 (See Bates Nos. VALERO-TC-EPA-RMP-005846 through VALERO-TC-EPA-RMP-005896);

- Visual and on-stream inspection documentation for piping circuits at the inlet and outlet of the HF Alky butane defluorinators D-1168 and D-1169 (See Bates Nos. VALERO-TC-EPA-RMP-005897 through VALERO-TC-EPA-RMP-005972);

- Visual and on-stream inspection documentation for piping circuits for the overheads from the HF Alky main fractionator (A-89 to P863/864) (See Bates Nos. VALERO-TC-EPA-RMP-005973 through VALERO-TC-EPA-RMP-006090); and

- Visual, non-intrusive, on-stream and internal inspection documentation for HF Alky vessels D-401, D-402, D-1168, D-1169, A-92, and D-396 (See Bates Nos. VALERO-TC-EPA-RMP-005722 through VALERO-TC-EPA-RMP-005896).

Valero completes monthly testing of the firewater cannons (fire monitors), vapor mitigation system, and surveillance system for the HF Alky. Valero representatives stated that testing includes engaging the equipment both manually and remotely and observing the water flow through each piece of equipment. The provided inspection and testing records denote the date and time of the test completed, the name of the person who performed the inspection or test, the equipment name and number involved in the test, and the answers to a series of 'Yes'/'No' questions completed by the inspector. Testing reports provided by Valero indicated fire monitors #1 through #7 were tested in both November and December to check the stream pattern and water flow (See Bates Nos. VALERO-TC-EPA-RMP-001566 through VALERO-TC-EPA-RMP-001579). Testing reports provided by Valero indicated vapor mitigation systems #1 through #5 and the associated surveillance systems were tested in both November and December (See Bates Nos. VALERO-TC-EPA-RMP-001580 through VALERO-TC-EPA-RMP-001619). Testing reports provided by Valero only list one 'Yes'/'No' question to describe the test performed and record the results from the completed testing for the vapor mitigation systems. For example, the test record provided for Alky HF Vapor Mitigation System #1 Test (Unit Curtain) states, "Was the Alky HF Mitigation Zone #1 test satisfactory?" and was simply answered with "Yes." No details are included to describe the inspection or test performed.

Valero utilizes 29 HF sensors as a part of their release mitigation system. Contractors complete quarterly calibration of the HF sensors. Valero provided a summary of the calibration inspection and testing records completed in 2022 (See Bates Nos. VALERO-TC-EPA-RMP-001620 through VALERO-TC-EPA-RMP-001623). P&IDs provided for the HF Alky have color coded both piping circuits and pressure vessels to identify the concentration of the HF acid at that point in the system and assign a corrosion zone number 1 to 5. Inspection plans for the identified equipment incorporate the damage mechanisms and associated inspection timing associated with the assigned corrosion zones.

External inspection forms list the date and time of the test completed, the name of the person who performed the inspection, the equipment name and number, and a brief description of the inspection scope. The form lists multiple areas for the inspector to review and provide notes on the current state of the equipment. Inspectors also complete a section for recommendations and

general notes. Each of the inspection reports provided by Valero included multiple photographs to document the current state of the vessel.

Internal inspection reports begin by recording the date and time of the test completed, the name of the person who performed the inspection, the equipment name and number, and a summary of the actions taken during the internal inspection. A repair summary lists out any repair actions completed in detail. The inspection form for internal inspections also lists future recommendations as well as a summary of past internal inspections and any previous work completed.

On-stream inspection documentation records non-destructive testing (NDT) completed to measure vessel and piping thickness. The provided reports show the date and time of the test completed, the name of the person who performed the inspection, the equipment name and number, and the attached results. The reports do not include any description of the testing performed. During the inspection, Valero staff stated that they utilize a contractor to complete ultrasonic thickness testing for the on-stream inspection of refinery equipment; however, the inspection documents do not list the use of ultrasonic testing or describe any procedures followed during the testing.

The most recent on-stream inspection report provided for the piping circuit for the overheads from the HF Alky main fractionator was dated as completed in 2016 (See bates Nos. VALERO-TC-EPA-RMP-006087 through VALERO-TC-EPA-RMP-006090). According to Valero's Basic Practice for inspection of fixed equipment for the HF Alky (See bates Nos. VALERO-TC-EPA-RMP-001399 through VALERO-TC-EPA-RMP-001424), on-stream inspections are required every five years for piping. An additional on-stream inspection was due in 2021; however, on-stream inspection records associated with on-stream inspection of this piping circuit were not supplied to the inspection team. This indicates that Valero has not followed its own internal requirement of conducting on-stream inspections every five years for HF Alky unit piping.

**40 CFR § 68.75 - Management of Change (MOC)**

Valero has implemented an electronic MOC authorization (MOCA) system at the Texas City refinery that is intended to prevent changes to equipment, capacities, chemicals, modifications to control systems, safety systems, operating procedures, fire water systems or feed stocks without prior review and multiple director approvals (See Bates No. VALERO-TC-EPA-RMP-000464 through 000486). Temporary MOCs follow the same procedure as permanent MOCs but are given a 1-year expiration date from the date of creation, after which they require approval for an extension. Valero has also developed a form for emergency MOCs (EMOCA) for situations where the time delay required for using the normal MOCA procedure steps could result in a safety hazard, a significant environmental incident, equipment damage or unit shutdown. EMOCAs require approval by appropriate area production team members as well as operations and maintenance supervisors outside of normal working hours.

The electronic MOCAs include the technical basis for the change and require review of potentially impacted PSI. The MOCA form also includes fields to evaluate the potential for new hazards associated with the proposed change and any safeguards including administrative, procedural, and engineered that could prevent or minimize the likelihood or severity of possible accidents associated with the proposed change.

MOCAs are initiated by the Asset Owner who assigns a MOCA Champion that is responsible for coordinating any pre-work so that sufficient documentation is available for review. The MOCA Champion is also responsible for assuring the field work is completed per the approved design and for leading the pre-startup safety review (PSSR). The Complex/Area Line Team that includes the Complex Manager, Area Superintendent, and multi-discipline Subject Matter Experts (SME) is responsible for review and approval of any not-in-kind change prior to initiating MOCA. The MOCA Authorizer is responsible for reviewing the concept of the idea, affirming the proper documentation has been provided, ensuring the proper levels of review have been completed, and giving final approval to proceed with the change. Lastly, the Technical Trainer is assigned as the MOCA Notifier who is responsible for assigning all awareness training to all affected personnel (e.g., Operations, Maintenance, etc.).

**40 CFR § 68.77 - Pre-Startup Safety Review (PSSR)**

Valero requires the completion of a PSSR checklist before the MOCA changes are approved and ready for startup. The PSSR Team Leader (MOCA Champion) is responsible for coordinating the activities of the PSSR Team to ensure the MOCA change is complete. Any identified post-startup action items are tracked to completion before closing the MOCA.

**40 CFR § 68.79 - Compliance Audits**

Valero completed their most recent compliance audits of the Texas City refinery in October 2018 and September 2021 using audit teams having members from Valero's corporate offices and other Valero refineries. The 2018 compliance audit identified four findings: three related to mechanical integrity and one related to the Facility's PHAs (see Bates No. VALERO-TC-EPA-RMP-000497 through 000505). The 2021 compliance audit identified three findings: one related to the Facility's contractors' program, one related to mechanical integrity, and one related to MOCs (See Bates No. VALERO-TC-EPA-RMP-000519 through 000525).

The 2018 audit finding found that the refinery had begun to implement inspections for deep well can pump (DWCP) systems but that such inspections had not yet been completed. A subsequent memorandum dated December 27, 2019 (See Bates No. VALERO-TC-EPA-RMP-000508) regarding the inspections of the DWCPs indicates the refinery developed a risk ranking based on risk level, consequence, and pump age to prioritize inspections of the pumps and the memo states the refinery planned to inspect an average of 24 pumps per year so that all 82 pumps would be inspected by the end of 2022. Based on discussions with Valero's reliability engineers during EPA's December 2022 inspection, the DWCP inspections will likely not be completed until mid-2023, nearly 5 years after this issue was first identified in the 2018 compliance audit.

Audit finding number two (#2) from the 2021 audit found that six (6) pressure safety valves (PSVs) had been deferred beyond the 30-day limit with no Risk Management Committee (RMC) review as required by site procedure MIIM 34.0 (rev 0). The proposed corrective action included in the inspection report states, "Develop and implement a process to ensure that future deferral requests adhere to the current deferral procedure or alternatively, revise the procedure to reflect deferral guidelines as permitted by API 510 6.7" (See Bates No. VALERO-TC-EPA-RMP-000524). An interoffice memorandum dated March 29, 2022 with the subject 2021 Corporate PSM Audit Findings and Corrective Action Plan (See Bates No. VALERO-TC-EPA-RMP-000526 through 000527) states that for audit finding #2, "All future fixed equipment deferred

inspections will be reviewed by the site RMC, as per Mechanical Integrity Inspection Manual (MIIM) 34.0 guidelines."

The corrective action included in the March 2022 memorandum is consistent with the proposed corrective action in the compliance audit report. The corrective action in the compliance audit report indicates a new process will be developed to ensure the future deferral requests adhere to the current procedure. The result of this new process is to ensure that all referrals are reviewed by the site RMC as per MIIM 34.0 guidelines. Valero has developed a new process to ensure the referrals are reviewed by the RMC per MIIM 34.0 guidelines (see Bates No. VALERO-TC-EPA-RMP-006093 through 006099).

The inspection team has identified an AOC at the end of this inspection report for this program element.

**40 CFR § 68.81 - Incident Investigation**

The Facility has an incident investigation procedure that covers process safety incidents subject to RMP as well as incidents of lesser severity or other types (e.g., near misses, personnel safety). For incidents, the Facility uses a root cause analysis mapping tool that follows the Five-Why approach to determine how the incident could have been prevented. The Facility tracks incident investigations, including causes and corrective actions in their environmental and health and safety management system.

The Facility investigated two incidents in the last five years, the first of which is included in the RMP accident history and the second which occurred in the past six months and will reportedly be included as an update to the Facility's next RMP submittal:

- HF Alky incident on April 19, 2018; and
- GOHT incident on August 19, 2022.

Each incident resulted in the release of hydrocarbons. The April 19, 2018, incident also resulted in the loss of 974 pounds of hydrofluoric acid from the unit. The root cause of the April 2018 incident in the HF Alky unit was a 37-foot section of feed pipe that failed in the Main Fractionator due to the presence of high amounts of residual elements (REs, e.g., copper, nickel, and chromium) in the carbon steel pipe's composition. The presence of REs at relatively high quantities resulted in a significant increase in localized corrosion rates due to the HF acid service of the piping (See Bates No. VALERO-TC-EPA-RMP-000075 through 000143).

The April 19, 2018 incident required the replacement of significant sections of piping as well as major portions of the Main Fractionator. The incident resulted in one lost time injury to a worker. The root cause investigation report did not include the date the investigation began, any recommendations, or any indication the report was reviewed with all affected personnel relevant to the incident findings at the conclusion of the investigation. The EPA inspection team discussed the incident with Valero's Director of Process Safety who stated that because of the incident, 100% positive material identification (PMI) has now been conducted on all equipment in the HF Alky unit to verify no portions of the carbon steel piping contains elevated levels of Res.

The August 19, 2022, incident in the GOHT Treat Gas Furnace was caused by a tube rupture that released hydrogen and hydrocarbon feed that resulting in a fire and equipment damage. The cause of the tube rupture, as described in the investigation report (See Bates No. VALERO-TC-EPA-RMP-000144 through 000150), was low flow through Pass 4 of the heating tubes which allowed sections of the tube to reach temperatures exceeding 1,500$^{o}$F which is above design temperature limits. The root cause of the low flow through the Pass 4 heating tubes was not following the Treat Gas Furnace startup procedure that required verifying unit stability prior to startup. The investigation report includes the date the incident investigation began as well as recommendations and individuals assigned to the recommendations who were affected by the incident.

The inspection team has identified AOCs at the end of this inspection report for this program element.

**40 CFR § 68.83 - Employee Participation**

Valero developed a policy and procedure for employee participation that includes both volunteer and appointed employee's involvement in all elements of the Facility's RMP and PSM program, including conducting PHAs (See Bates No. VALERO-TC-EPA-RMP-000528 through 000532). The procedure includes employee participation responsibilities (primary, secondary, or tertiary) for operations, maintenance, engineering, safety, training and purchasing for the RMP elements. All employee policy changes or development of new policies at the refinery are presented to the Rules and Procedures Committee by the relevant department managers. The Rules and Procedures Committee consists of a team of 4 to 8 employees (both hourly and salary) selected to review, comment, and sign off on approved policies and procedures. For any changes that are recommended, policies and procedures are reviewed by management for implementation prior to rollout and training.

Interviews with console operators during the inspection verified that operators are encouraged to participate in PHAs when they are conducted within their operating unit. Completed PHAs are available to all operations employees through the refinery intranet system. All employees participate periodic safety meetings and operators are encouraged to identify and report any identified issues.

**40 CFR § 68.85 - Hot Work Permits**

Valero has developed and implemented a hot work procedure (See Bates No. VALERO-TC-EPA-RMP-000533 through 000536) that encompasses all Valero employees and contractors conducted at the Texas City refinery which could result in an ignition source. The program requires all employees to obtain a hot work permit from the operating unit for which the work will be conducted. To obtain a hot work permit from the operating unit, a shift operator from the unit will conduct a walk-through to discuss the work to be performed with and all required safeguards with Facility maintenance employees or contractors. Atmospheric gas testing is required for all hot work permits in the area where work will be performed for at least a 35-foot radius prior to issuing the permit. Hot work permits are issued for a maximum of 24-hours, after which a new hot work permit must be developed. All high energy hot work involving heat or spark producing activities (welding, flame cutting, grinding) requires continuous atmospheric

monitoring and a trained fire watch must be present for the duration of and at least 30 minutes after the hot work is complete.

**40 CFR § 68.87 – Contractors**

Valero requires all contractors to subscribe to ISNetworld (ISN), a third-party contractor safety data management provider and become qualified to perform work at the refinery. Contractors that request to work at the refinery must receive an ISN Dashboard Grade of "B" or better based on criteria including experience, citations, fatalities, recordable incident rate, information provided in the Valero qualifications questionnaire, and their written safety program. After a contractor begins work and at the completion of a job, a contractor evaluation report will be prepared to review the contractor performance. If concerns regarding contractor performance arise during the course of the work, the report is available to communicate issues to all Valero sites. If a contractor's Dashboard Grade drops to a "C" after award of the contract, the contractor is placed on a 30-day probation by the site, during which time the contractor representative will meet with the site Business Unit Manager to review issues affecting the Dashboard Grade.

For individual contractors providing short-term services (60-days or less), Valero requires completion of the Texas City Site Specific Contractor Safety Council orientation issued as part of a Contractor with a Health and Safety Handbook (See Bates No. VALERO-TC-EPA-RMP-000542 through 000568) and attendance at daily safety meetings with their supervisor. The Handbook includes safety information related to energy source control, hot work, elevated work and fall protection, barricades, alarms, muster points and personal protective equipment (PPE).

Review of Valero's PSM onsite Contractor Assessment Questionnaire for HydroChem/PSC from August 31st to September 7th, 2021 (See Bates No. VALERO-TC-EPA-RMP-001015 through 001022) verifies Valero regularly evaluates contractor critical documentation (e.g., TWIC documentation, trailer permit, tool-box meetings, etc.), incident reporting, and written safety programs and permit compliance.

**40 CFR § 68.95 - Emergency Response**

Valero provided EPA their integrated contingency plan for the Texas City refinery. The first portion of the integrated contingency plan includes the Emergency Action Response Plan (ERAP) that includes information on the emergency response team, emergency notifications for spills or release events, response equipment and resources, evacuations, incident classifications, and incident reporting. The second portion of the plan includes information on managing any releases at the facility. Emergency release notifications to external parties including the NRC are based on the release event. In the case of NRC notifications, NRC is notified when there is a release to water (lakes, streams, ocean) or when there is a releases of a reportable quantity (RQ) of a hazardous systems for which an SDS is maintained. Releases causing reportable/excessive air emissions (i.e., hydrocarbons, smoke, odor) are made to State air pollution agency(s) and local air pollution agency(s), if applicable, and not NRC (See Bates No. VALERO-TC-EPA-RMP-002887).

The Valero Texas City refinery is a responding facility and has the capability to address emergency situations including fires, chemical releases and medical emergencies involving Valero employees and on-site contractors. The refinery has two full-time emergency response

personnel, 75 trained fire fighters, four trained emergency medical technicians (EMTs), and an on-site nurse located in the refinery medical clinic. The Texas City refinery has a mutual aid agreement with the neighboring refinery (i.e., Marathon) to assist with fighting large fires as well as support from the Texas City Fire Department to coordinate off-site notification and evacuations if needed. Firefighting equipment includes fixed water cannons located throughout the refinery, diesel driven firewater pumps used to pump water from the firewater storage tanks, fire trucks, firefighting PPE, and an ambulance. Water spray curtains connected to the fire water system are located in and around the HF Alky unit to contain an HF release from the unit.

All trained responders annually attend firefighter training at Texas A&M Fire School. Valero is an active member in the Galveston County Local Emergency Planning Committee (LEPC) and Valero emergency response personnel attend quarterly LEPC meetings. The most recent incident response drill was conducted June 29, 2022. The drill was a manpower (mutual aid) hazardous materials response to a tank containing acrylic acid at BWC that had lost cooling and was heating. In May 2021, Valero conducted a muster/response drill in response to a U.S. Coast Guard request to inspect the refinery's oil response capabilities for a hydrocarbon release to water.

The Facility provided their annual water spray system inspection/test results for the DHT and FCCU for 2020, 2021 and 2022. Inspection/testing was conducted by Total Safety and provided a visual inspection of the general condition of the equipment including valves and gauges, nozzles, piping and pipe hangers, documentation for quarter spray testing, and fire department connections. Review of the 2020, 2021 and 2022 annual inspection/test reports for the FCCU A-13 Bottoms Pump showed consistent concerns issues with the equipment in each of the three years. For example, in May 2020 the Total Safety inspector noted corrosion on valves and piping, no signage or nameplates are provided on the equipment regarding hydraulic capacity, and that piping, strainers and vales subject to freezing are not properly protected (See Bates No. VALERO-TC-EPA-RMP-003261 through 003262). These same deficiencies were again noted in the January 2021 inspection (See Bates No. VALERO-TC-EPA-RMP-003272 through 003274) and in the September 2022 inspection (See Bates No. VALERO-TC-EPA-RMP-003287 through 003288) Similar issues including no freeze protection, damaged and corroded spray nozzles, unacceptable piping supports and lack of signage were also noted by Total Safety when inspecting the FCCU Fractionator N. water spray system (See Bates No. VALERO-TC-EPA-RMP- 003289 through 003290).

A similar lack of maintenance for the DHT water spray system was noted by Total Safety in their 2020, 2021 and 2022 inspection/test reports. In May 2020, the Total Safety inspector documented 17 deficiencies with the unit ranging from no freeze protection, corrosion on piping and valves, pipe hangers not being attached, clogged spray nozzles, the pressure switches in the wrong position, no signage regarding hydraulic capacity, no fire department connection, etc. (See Bates No. VALERO-TC-EPA-RMP-003259 through 003260). Again, in January 2021, the Total Safety inspector again noted corrosion on the main control valve, no freeze protection, broken or no gauges, and no fire department connection (See Bates No. VALERO-TC-ERP-RMP-003269 through 003271). Similar findings were again noted in the September 2022 Total Safety inspection report and included clogged spray nozzles, corroded piping and control valves throughout the system, piping hangers corroded throughout the system, one section of

distribution piping being supported with a rope, no signage or freeze protection (see Bates No. VALERO-TC-EPA-RMP-003284 through 003286).

Annual inspection of the fire monitors throughout the facility identified multiple issues with the integrity of the equipment. For example, the August 2022 inspection of the Hydrant/Manifold Fire Line in the FCCU Gas Plant North Ally had no pressure or flow and was corroded and pitted. The Fire Monitor located in the Norwest Sub G area of the FCCU could not be tested because it was "Dangerous to Operate" while the Fire Monitor located near the north slurry pumps in the FCCU was leaking and had both corrosion and pitting (See Bates No. VALERO-TC-EPA-RMP-003437 through 003444). The August 2022 inspection report for the Fire Monitor located in the southeast portion of the Alky Unit had physical damage, no flow, corrosion and pitting (See Bates No. VALERO-TC-EPA-RMP-003450).

The inspection team has identified AOCs at the end of this inspection report for this program element.

**40 CFR § 68.195 - Risk Management Plan**

Valero submitted RMPs to EPA in 1999, 2003, 2004, 2008, 2013, 2016 and 2020. The resubmissions were all within the 5-year time frame. The most recent submission was in May 2020 and included information in the Accident History Section regarding the April 19, 2018 fire and hydrofluoric acid release that occurred in the HF Alky unit.

**EPCRA Emergency Release Notification - 40 CFR § 355.30**

On August 19, 2022, a release of flammable hydrogen and hydrocarbons in Valero's GOHT Treat Gas Furnace caused by a tube rupture resulted in a fire and equipment damage. According to Valero's incident investigation report dated December 5, 2022, "Agency notifications were timely made (see Bates No. VALERO-TC-EPA-RMP-000144)." However, a review of the U.S. Coast Guard's National Response Center (NRC) database did not show any record of the release notification being made for the flammable materials. If an accidental release of a hazardous substance designated pursuant to 40 CFR Part 302.4[2] of the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) occurs, the facility must notify the NRC as well as the State Emergency Response Center (SERC) and the LEPC.

The inspection team has identified AOCs at the end of this inspection report for this item.

**EPCRA Tier II Reporting – 40 CFR § 370.42**

The Valero refinery stores both anhydrous ammonia and aqueous ammonia for use in operating units where nitrogen oxide control is needed. According to the RY 2021 EPCRA Tier II report (See Bates No. VALERO-TC-EPA-RMP-000659 through 000834), the refinery stores between 75,000 and 99,999 pounds (lbs.) of 31% w/w aqueous ammonia. However, anhydrous ammonia is not listed in the Tier II reports. Valero personnel stated the anhydrous ammonia storage tank at the refinery is approximately 1,000 gallons and therefore can contain up to 6,000 lbs. of

[2] Unlisted hazardous substances. A solid waste, as defined in 40 CFR 261.2, which is not excluded from regulation as a hazardous waste under 40 CFR 261.4(b), is a hazardous substance under section 101(14) of the Act if it exhibits any of the characteristics identified in 40 CFR 261.20 through 261.24.

anhydrous ammonia based on a specific gravity of 0.73 kg/$m^3$. Anhydrous ammonia is considered an EPCRA Extremely Hazardous Substance (EHS) having a Tier II reporting threshold of 500 lbs. After becoming aware of this discrepancy during the EPA inspection, Valero has reportedly updated their EPCRA Tier II report.

The inspection team has identified AOCs at the end of this inspection report for this item.

## CLOSE OUT MEETING

Inspector Buchanan initiated the close out meeting at 10:00 am on Friday, December 16, 2022. She discussed the timing for Valero to provide the outstanding responses to EPA's documentation requests. She stated that the inspection team would not discuss any areas of concern until all the requested documents had been provided and the inspection team could adequately review the information.

Inspector Buchanan discussed the estimated timing for delivery of the inspection report to Valero and the expected coordination between U.S. EPA and the Valero. There were no questions from the Valero personnel, and she adjourned the close out meeting around 10:30 am. The Close Out Meeting Sign-In Sheet recorded all Valero representatives present at the close out meeting.

Valero sent three batches of the requested documentation to EPA via a secured web link on December 14, 2022, January 13, 2023, and February 3, 2023. The inspection team reviewed these documents to better understand the implementation of and compliance with the requirements under CAA § 112(r) Risk Management Plan, EPCRA §§ 302-312, and CERCLA § 103 at the refinery and updated the report accordingly.

## AREAS OF CONCERN

1. **Applicability, 40 CFR § 68.10(a)(3) –** *An owner or operator of a stationary source that has more than a threshold quantity of a regulated substance in a process shall comply with the requirement of this part no later than the date on which a regulated substance is first present above a threshold quantity in a process.*

    - Valero did not include the 75,000 lbs. of aqueous ammonia (31%) stored at the facility in their RMP.

2. **Offsite Consequence Analysis Documentation, 40 CFR § 68.39(e) –** *The owner or operator shall maintain the following records on the offsite consequence analysis (e) data used to estimate population and environmental receptors potentially affected.*

    - Valero reported environmental receptors impacted for a toxic worst case release scenario in their RMP; however, Valero was unable to produce records showing how these affected receptors were determined.

3. **Process Safety Information, 40 CFR § 68.65(c)(1)(iv)** – *Information concerning the technology of the process shall include at least the following: Safe upper and lower limits for items such as temperatures, pressures, flows or compositions.*

- The operating temperatures listed in the operating limits for the DHT E-1290/91/92 Stripper Bottoms and the DHT E-1293/94/95/96 Effluent Reactor Feed are above the equipment design temperature.

4. **Process Hazard Analysis, 40 CFR § 68.67(c)(3) -** *The PHA shall address engineering and administrative controls applicable to the hazards and their interrelationships such as appropriate application of detection methodologies to provide early warning of release.*

    - The PHAs do not address engineering and administrative controls to prevent flooding in the processing units even though the Valero Texas City refinery is located in a coastal area along Galveston Bay which has an increased risk of flooding during intense storms and hurricanes exacerbated by climate change.

5. **Process Hazard Analysis, 40 CFR § 68.67(e) –** *The owner or operator shall establish a system to promptly address the team's findings and recommendations; assure that the recommendations are resolved in a timely manner and that the resolution is documented.*

    - The 2016 HF Alky PHA included two action items having a residual risk ranking of 2 due to the loss on containment and potential for a fire or explosion but the completion dates for these action times were scheduled out to October 31, 2023, seven (7) years after they were first identified in the PHA.

    - The 2021 HF Alky PHA had two action times having a residual risk ranking of 2 due to the loss of containment from overheating resulting in a fire and release of HF but the completion dates for these action items is scheduled out to April 30, 2024, more than three (3) years after they were first identified in the PHA.

6. **Mechanical Integrity, 40 CFR § 68.73(d)(3) -** *Inspection and testing. (4) The frequency of inspections and tests of process equipment shall be consistent with applicable manufacturers' recommendations and good engineering practices, and more frequently if determined to be necessary by prior operating experience.*

    - Valero requires on-stream inspections for piping every five years; however, the most recent on-stream inspection report for the piping circuit for the overheads from the HF Alky main fractionator was dated as completed in 2016. An additional on-stream inspection was due in 2021. Inspection results for an on-stream inspection for this piping circuit were not provided to the inspection team to confirm and/or indicate that such inspections were completed at the required frequency.

7. **Mechanical Integrity, 40 CFR § 68.73(d)(4) -** *Inspection and testing. (4) The owner or operator shall document each inspection and test that has been performed on process equipment. The documentation shall identify the date of the inspection or test, the name of the person who performed the inspection or test, the serial number or other identifier of the equipment on which the inspection or test was performed, a description of the inspection or test performed, and the results of the inspection or test.*

- The provided testing reports for vapor mitigation systems #1 through #5 only list one 'Yes'/'No' question on whether the test was satisfactory to record the results from the completed testing for the vapor mitigation systems. There are no recorded details to describe how the inspection or test was performed.

- On-stream inspection documentation records do not list the use of ultrasonic testing or describe any procedures followed to complete the testing.

8. **Mechanical Integrity, 40 CFR § 68.73(e) -** *Equipment deficiencies. The owner or operator shall correct deficiencies in equipment that are outside acceptable limits (defined by the process safety information in § 68.65) before further use or in a safe and timely manner when necessary means are taken to assure safe operation.*

    - Corrosion Model Diagrams indicate vessel D-756 recycle gas amine contactor knock-out drum is chrome alloy steel but the piping used to transfer sour gas from D-752 to D-756 and from D-756 to A-170 is carbon steel. Damage mechanisms indicated on the Corrosion Model Diagrams for vessel D-756 include wet hydrogen sulfide corrosion, sour water corrosion, and external corrosion. These same damage mechanisms will also impact transfer piping to and from D-756. Unless Valero can document the carbon steel used in this application is consistent with the requirements of NACE International Standard MR0103 (2005), then chrome alloy steel containing 1.25% chromium should also be used for the transfer piping between D-752 and D-756 and between D-756 and A-170.

9. **Compliance Audits, 40 CFR § 68.79(d) –** *The owner or operator shall promptly determine and document an appropriate response to each of the findings of the compliance audit, and document that deficiencies have been corrected.*

    - The 2018 audit finding found that the refinery had begun to implement inspections for deep well can pump (DWCP) systems and all would be inspected by the end of 2022. According to Valero's reliability engineers, the DWCP inspections will likely not be completed until mid-2023, nearly 5 years after they were first identified in the 2018 compliance audit.

10. **Incident Investigation, 40 CFR § 68.81(d)** – *A report shall be prepared at the conclusion of the investigation which includes at a minimum: … (2) the date the investigation began; … and (5) any recommendations resulting from the investigation.*

    - The April 19, 2018 incident investigation report for the fire and hydrofluoric acid release from in the HF Alky unit did not include the date the investigation began or any recommendations.

11. **Incident Investigation, 40 CFR § 68.81(f)** – *The report shall be reviewed with all affected personnel whose job tasks are relevant to the incident findings including contract employees where applicable.*

- The April 19, 2018 incident investigation report for the fire and hydrofluoric acid release from in the HF Alky unit did not provide any indication the report was reviewed with all affected personnel relevant to the incident findings.

12. **Emergency Response, 40 CFR § 68.95(a)(2)** – *The owner or operator shall develop and implement an emergency response program for the purposes of protecting public health and the environment. Such programs shall include procedures for the use of emergency response equipment and for its inspection, testing and maintenance.*

    - The Facility is not maintaining the integrity of all their water spray systems and fire monitors necessary for fighting a fire within the refinery.

13. **EPCRA Emergency Release Notification, 40 CFR § 355.30 -** *If an accidental release of a hazardous substance designated pursuant to 40 CFR Part 302.4[3] of the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) occurs, the facility must notify the NRC as well as the State Emergency Response Center (SERC) and the LEPC.*

    - A review of U.S. Coast Guard's National Response Center (NRC) database did not show any record of a flammable material release notification being made by Valero for the August 19, 2022 fire that occurred in the GOHT.

14. **EPCRA Tier II Reporting, 40 CFR § 370.40 -** *Facilities are required to comply with the hazardous chemical reporting requirements by March 1 every year and must submit inventory information regarding any hazardous chemical present the facility at any time during the previous calendar year in an amount equal to or in excess of its threshold level provided in § 370.10.*

    - Valero stores approximately 6,000 lbs. of anhydrous ammonia on site. The EPCRA Tier II reporting threshold for anhydrous ammonia (an EHS) is 500 lbs. but the refinery's RY 2021 EPCRA Tier II report does not include this chemical.

[3] Unlisted hazardous substances. A solid waste, as defined in 40 CFR 261.2, which is not excluded from regulation as a hazardous waste under 40 CFR 261.4(b), is a hazardous substance under section 101(14) of the Act if it exhibits any of the characteristics identified in 40 CFR 261.20 through 261.24.

**LIST OF ATTACHMENTS**

Attachment 1: Document Request List

Mark Briggs, ERG — Date: 10/31/2023

Amy Federoff, ERG — Date: 10/30/2023