

U.S. EPA REGION 6
ENFORCEMENT & COMPLIANCE ASSURANCE DIVISION
CLEAN AIR ACT SECTION 112(r) INSPECTION REPORT

Stationary Source	Valero Ardmore Refinery
Facility Location	One Valero Way Ardmore, OK 73401
Media	Clean Air Act (CAA) – Section 112(r) Risk Management Program (RMP) - 40 CFR Part 68
FRS Number	110000606746
USEPA RMP Facility ID	1000 0012 8177
Latitude / Longitude	30.477096, -91.211180
Date of Inspection	January 27 – 30, 2025
US EPA Contact	Elizabeth Pham, U.S. EPA Region 6 Chemical Accident Enforcement Section
Description of Activities	Inspection included the following activities: • Opening conference with facility representatives • On-site document review • Field verification • Personnel interviews • Closing meeting with facility representatives
Inspection Participants	U.S. EPA Region 6 • Elizabeth Pham Oklahoma Department of Environmental Quality (ODEQ) • Hanna Thornberg • Vanessa McKinzey Eastern Research Group, Inc. (ERG), contractor for U.S. EPA • Brook McKeown • Marissa Maier • Joseph Bertolami
Facility Participants	[REDACTED]/Operations Director
	[REDACTED]/Process Safety Management (PSM) Manager
	[REDACTED]/Technical Director
	[REDACTED]/Environmental Manager
	[REDACTED]/Environmental Engineer
	[REDACTED]/Voluntary Protection Program (VPP) Coordinator
	[REDACTED]/RADAR Facilities
	[REDACTED]/RMW, Union Representative
	[REDACTED]/Hydrofluoric Acid (HF) Alkylation Unit Asset Superintendent
	[REDACTED]/Fluidized Catalytic Cracking (FCC) Unit Asset Superintendent

Facility Participants (contd.)	[REDACTED]/Reliability Manager	
	[REDACTED]/Staff Reliability Engineer	
	[REDACTED]/Instrumentation, Analyzer, Electrical, and Control (IAED) Reliability Manger	
	[REDACTED]/Maintenance Director	
	[REDACTED]/Human Resources (HR) Administrator	
	[REDACTED]/Technical Trainer	
	[REDACTED]/Senior Safety Engineer	
	[REDACTED]/Emergency Response Superintendent	
	[REDACTED]/Safety	
	[REDACTED]/Vice President (VP) and General Manager	
For EPA – ERG Lead Inspector Signature/Date		
	Brook McKeown, ERG	Date
EPA Section Supervisor Signature/Date		
	Kayla Buchanan	Date

FACILITY/PROCESS DESCRIPTION

The Valero Ardmore Refinery (the Facility, or the refinery) is located in Ardmore, Carter County, Oklahoma. Valero Refining Company – Oklahoma (doing business as the Valero Ardmore Refinery) currently owns and operates the Facility. The Facility began operations as the Wirt Frankland Refinery in 1913 and has operated under various owners before Valero acquired the refinery in 2001.

The Facility operates 24 hours per day and 7 days per week on rotating 12-hour shifts, following the DuPont shift schedule. The Facility employs approximately 270 full-time employees and approximately 85 nested contractor employees under normal Facility operating conditions. The International Union of Operating Engineers (IUOE) represents hourly employees at the Facility. Facility operations are controlled from the Main Control Room, which is located in the east-central portion of the Facility.

The Facility processes sweet and sour crude oils sourced predominantly from the Permian Basin and the Cushing, OK hub via third-party pipeline.¹ The Facility receives hydrofluoric (HF) acid via truck for use in the HF Alkylation (HF Alky) Unit. Refinery products primarily consist of gasoline and diesel products, transferred offsite via railcar, pipeline, and truck. The Facility is permitted for a crude oil throughput capacity of 97.1 million barrels per day (MBPD).

The Facility reported six (6) Program Level 3 (P3) and seven (7) Program Level 1 (P1) covered processes, subject to the requirements of United States Environmental Protection Agency's (EPA) Risk Management Program (RMP), in its most recent RMP submission, dated April 15, 2020. These processes are listed in Table 1, below.

Table 1. RMP Covered Process for the Facility

Process ID	Process Name	Program Level	Chemical	Quantity (lb.)	Category
1000103725	Tank Car Loading Rack	3	Flammable Mixture	2,210,000	Flammable
1000103726	C3/C4 Splitter	3	Flammable Mixture	121,400	Flammable
1000103728	Hydrofluoric Acid Alkylation Unit (Alky Unit)	3	Hydrogen fluoride/ Hydrofluoric acid (conc 50% or greater) [Hydrofluoric acid]	128,000	Toxic
			Flammable Mixture	638,300	Flammable
1000103733	Liquid Petroleum Gas (LPG) Storage East	3	Flammable Mixture	4,167,800	Flammable
1000103734	LPG Storage West	3	Flammable Mixture	4,709,900	Flammable
1000103736	Flare Gas Recovery	3	Flammable Mixture	78,900	Flammable
1000103727	Crude/Vacuum/Saturated (SAT) Gas Unit	1	Flammable Mixture	126,900	Flammable
1000103729	Fluid Catalytic Cracking	1	Flammable Mixture	114,200	Flammable

¹ <https://www.valero.com/about/locations/ardmore-refinery>

Table 1. RMP Covered Process for the Facility

Process ID	Process Name	Program Level	Chemical	Quantity (lb.)	Category
1000103730	Naphtha Hydrotreater Unit (NHT)/Reformer/ Bensat	1	Flammable Mixture	142,000	Flammable
1000103731	Diesel Hydrodesulfurization Unit (DHDS)	1	Flammable Mixture	12,300	Flammable
1000103732	Cat Feed Hydrotreater	1	Flammable Mixture	82,000	Flammable
1000103735	Hydrocracker Unit	1	Flammable Mixture	17,200	Flammable
1000106877	Gasoline Desulfurization Unit (GDU)	1	Flammable Mixture	1,220,000	Flammable

Based on the limited time available for the inspection, the EPA Region 6 inspection team (EPA inspection team) focused on the following units:

- Hydrofluoric Acid Alkylation (HF Alky) Unit [RMP Process ID 1000103728];
- Fluidized Catalytic Cracking Unit (FCCU) [RMP Process ID 1000103729]; and
- Liquid Petroleum Gas (LPG) Storage West [RMP Process ID 1000103734]

The EPA inspection team selected the HF Alky Unit because it was the basis for the Facility's worst-case release scenario for toxic substances for its Offsite Consequence Analysis (OCA). Similarly, the EPA inspection team selected LPG Storage West because it is the basis for the Facility's worst-case release scenario for flammables for its OCA. The EPA inspection team selected the FCCU due to nationwide safety concerns following FCCU accidents at the ExxonMobil Torrance and Husky Superior refineries.

PURPOSE OF THE INSPECTION

EPA selected the Valero Ardmore Refinery for inspection because it operates an alkylation unit that uses HF acid. EPA's National Enforcement and Compliance Initiatives (NECIs) for FY 2024-2027² prioritize the inspection of facilities that use HF, due to recent incidents involving the release or potential release of HF and the potentially catastrophic consequences of a HF release.

The EPA inspection team, consisting of three contractor inspectors from Eastern Research Group, Inc. (ERG), one EPA inspector, and two representatives of the Oklahoma Department of Environmental Quality (ODEQ), inspected the Facility from January 27, 2025 through January 30, 2025. The inspection focused on the Facility's implementation of and compliance with the requirements under CAA § 112(r) Risk Management Plan. While at the refinery, the EPA inspection team performed a field walkdown that included the HF Alky Unit, FCCU, and LPG

² <https://www.epa.gov/system/files/documents/2023-08/fy2024-27necis.pdf>

Storage West; conducted interviews with refinery representatives; and requested documents for review.

In preparation for the inspection, Aimee Boss of U.S. EPA Region 6 sent an electronic notice of inspection and request for information (RFI) to [REDACTED], Environmental Manager for the Valero Ardmore Refinery, on November 25, 2024. The RFI included a list of documentation that the EPA inspection team intended to review upon their arrival at the Facility on January 27, 2025. The EPA correspondence to the Facility also requested that the Facility inform employee representatives of the inspection and invite them to participate as required by CAA § 112(r)(6)(L). [REDACTED] confirmed receipt of the notice of inspection on behalf of the Facility on December 3, 2024.

OPENING CONFERENCE

Inspector Brook McKeown initiated the opening conference at approximately 9:30 am on Monday, January 27, 2025, by introducing the members of the EPA inspection team and explaining the purpose and scope of the inspection. Inspector McKeown presented inspector credentials to [REDACTED], PSM Manager, and discussed the expected logistics of each day, which included interviews with Facility personnel, documentation requests, a windshield tour of the entire refinery, and walkthroughs of the HF Alky unit, FCCU, and LPG West processes. The opening meeting included Valero representatives who also participated throughout the inspection. The Sign-In Sheet (see Attachment 2) records all Valero representatives who were either present at the opening conference or who participated in interviews during the inspection.

INSPECTION OVERVIEW

Facility representatives provided a brief overview of the Facility's operations as well as specific details about the operation of the HF Alky Unit and FCCU processes. The Facility coordinated a windshield tour of the refinery to allow the EPA inspection team to become familiar with the physical layout and equipment at the Facility. The EPA inspection team met with multiple personnel to discuss the implementation of and compliance with the requirements of CAA § 112(r) Risk Management Plan with respect to the operation and maintenance of each unit. The Interview Sign-In Sheets (see Attachment 2) tracked all personnel that participated in interviews with the EPA inspection team. The EPA inspection team also completed walkthroughs of the HF Alky Unit, the FCCU, and the LPG West processes.

While on site, the EPA inspection team requested additional documentation to support the Facility's implementation of the applicable requirements of CAA § 112(r) Risk Management Plan at each of the selected operating units. The Inspection Document Review/Request List (see Attachment 3) recorded each document identified for further review by the EPA inspection team. The EPA inspection team provided a copy of the document request list to Valero at the conclusion of the inspection. Valero representatives provided some of the requested documentation during the inspection. Additional documentation was provided after the inspection on February 21, 2025, and April 17, 2025. The Inspection Report was developed

based on documents provided at the time of the inspection. Documents and information provided after April 17, 2025, were not considered part of the review

FIELD AND INITIAL INSPECTION OBSERVATIONS

Around 1:00 pm on Tuesday, January 28, 2025, refinery representatives provided a walking tour of the HF Alky Unit perimeter, the HF Alky operator shelter, and the HF Alky change room; the Central Control Room; the FCCU; and butane Tank 140 in LPG West. The EPA inspection team took a total of 41 photographs of process equipment. The photographs and photograph log are provided in Attachment 4. Observations made during the walkthrough of the processing units and onsite conversations with Facility personnel include:

- Process piping throughout the Facility, particularly in the HF Alky Unit was not sufficiently labeled or color-coded to indicate the contents or direction of flow per American Society of Mechanical Engineers (ASME) A13.1 (2023). For example, the HF piping (piping line 1''-P900391-HF2) that connects the depropanizer receiver (V-905) to the acid storage drum (V-902) was not labeled to indicate its contents, nor was it labeled to indicate direction of flow. Additionally, the line was not painted yellow to indicate HF service (see photograph 18 of Attachment 4). As such, this equipment does not comply with recognized and generally accepted good engineering practices (RAGAGEP) per 40 CFR § 68.65(d)(2).
- The EPA inspection team observed the following inconsistencies between piping and instrumentation diagrams (P&IDs) and equipment during the field inspection:
 - Alky Unit: The acid storage drum (V-902) P&ID (drawing number D-90-0033, revision 26³) shows a local pressure indicator (PI) assembly, including a ¾-inch block valve and ½-inch bleeder valve, immediately upstream of the truck connection flange on the nitrogen line at the HF truck unloading station. However, the EPA inspection team observed that the ½-inch bleeder valve was not present in the field (see photograph 18 of Attachment 4).
 - Alky Unit: The acid storage drum (V-902) P&ID (drawing number D-90-0033, revision 26⁴) shows a one-inch check valve, one-inch bleeder valve and one-inch block valve in series on line 1''-P900391-HF2 that connects the depropanizer receiver (V-905) to the acid storage drum (V-902). However, the EPA inspection team observed that the one-inch bleeder valve was present upstream of the check valve, and a flange was observed between the block valve and check valve that was not shown on the P&ID (see photograph 18 of Attachment 4).
 - LPG Storage West: The EPA Inspection Team observed a local PI off a ¾-inch line (see photograph 25 of Attachment 4) connected to a six-inch butane line (6''-P0168-1CS1S01-ARD) that runs between butane sphere TK-140 and other butane tanks

³ VALERO-AR-EPA-RMP-002173

⁴ VALERO-AR-EPA-RMP-002173

(drawing number D-100-0123⁵). However, the TK-140 butane sphere P&ID (drawing number D-100-0122, revision 16⁶) does not show this local PI.

- LPG Storage West: The TK-140 butane sphere P&ID (drawing number D-100-0122, revision 16⁷) shows two four-inch block valves on the discharge side of pump P-1080 (one on line 4''-P077-VBA and the other directly downstream of that valve, on line 4''-PR-00021-A1), which are indicated to be car-sealed open. However, car seals were not observed on either of these valves by the EPA inspection team during the site walkthrough and rusted car seals were observed on the ground in the vicinity of the valves (see photographs 26 and 28 of Attachment 4). The EPA inspection team observed that car seals were installed on these valves by Valero personnel as a corrective measure during the field inspection (see photographs 37 and 38 of Attachment 4).
- LPG Storage West: The EPA inspection team observed two approximately ¾-inch bleeder valves in series (see photograph 29 of Attachment 4) directly downstream of a four-inch block valve, all of which are downstream of a two-inch remotely operated flow control valve on line number 4''-PR-00021-A1. However, the TK-140 butane sphere P&ID (drawing number D-100-0122, revision 16⁸) does not show these two bleeder valves.

Due to these observed inconsistencies, the Facility has failed to maintain accurate process safety information in some of its P&IDs, which were not accurate and up to date in accordance with 40 CFR § 68.65(d)(1)(ii) at the time of the inspection.

- Two self-contained breathing apparatus (SCBA) in the HF Alky unit were overdue for flow testing per the December 4, 2024 due dates listed on the equipment tags (see photographs 2, 3, 6 and 8 of Attachment 4). Per 40 CFR § 68.95(a)(2) the Facility is required to develop and implement an emergency response program that includes procedures for the inspection, testing, and maintenance of emergency response equipment. Additional details are provided in the **Emergency Response** section of the inspection report for this observation.
- Three safety showers in the HF Alky Unit were overdue for inspection. Inspection tags show that they were last inspected in October 2024 (see photographs 9, 10, 14, 19 and 20 of Attachment 4). The inspection tags observed during the field inspection indicate that the Facility should have been conducting monthly inspections. Valero's Fire & Safety Inspection Testing and Maintenance Program document, dated December 31, 2024, states that safety shower testing will be performed by the Facility's contractor, Total Safety, on a monthly basis.⁹ As a result, the Facility failed to implement its emergency response equipment inspection, testing, and maintenance program for the inspection, testing, and maintenance

⁵ VALERO-AR-EPA-RMP-002187

⁶ VALERO-AR-EPA-RMP-002186

⁷ VALERO-AR-EPA-RMP-002186

⁸ VALERO-AR-EPA-RMP-002186

⁹ VALERO-AR-EPA-RMP-002007

of the SCBAs and safety showers noted above per 40 CFR § 68.95(a)(2). Additionally, the American National Standards Institute (ANSI) Z358.1 (2014), Section 4.6.2 requires weekly inspection and testing of emergency showers. As a result, the Facility's inspection frequency for its safety showers did not follow RAGAGEP. Additional details are provided in the **Emergency Response** section of the inspection report for this observation.

DOCUMENTATION REVIEW

Facility representatives responded to EPA's pre-inspection RFI and provided the requested documentation on January 10, 2025, with supplemental documentation provided on January 24, 2025. Additional documents were provided to the EPA inspection team in response to the Document Request List (Attachment 3) on January 29, 2025, and February 21, 2025. The following subsections include an overview of the EPA inspection team's review of program documentation for the relevant P1 and P3 Prevention Program elements and a summary of observed areas of concern (AOCs), where appropriate.

40 CFR PART 68 – CHEMICAL ACCIDENT PREVENTION PROVISIONS

40 CFR § 68.10 – Applicability

The Facility's most recent RMP submission, dated April 15, 2020, lists 13 covered processes (see Table 1). Seven of these covered processes are listed as RMP P1 covered processes for flammables (flammable mixtures) and the remaining six processes are listed as RMP P3 covered processes for flammables (flammable mixtures). The Facility also reported the HF Alky Unit as a RMP P3 covered processes for toxics (HF).

The Facility's RMP documentation includes a table of RMP Program Level Determinations for its P1 and P3 covered processes.^{10,11} This table includes process unit descriptions, RMP chemical names and quantities, OCA worst case scenario (WCS) vessel names and numbers, WCS endpoint distances calculated using EPA's RMP*Comp, offsite population impacts calculated using MARPLOT, WCS impacts to offsite public/environmental receptors (yes/no), and RMP program level.¹² The RMP documentation also provided maps showing the distance to endpoint and nearest public receptors for each scenario. The maps indicate that the distance to endpoint for all P1 WCS are less than the distance to offsite receptors.

The Facility's April 2020 RMP Submission does not list any releases in the accident history section and Facility personnel indicated that the Facility had not had any accidental releases that met the inclusion criteria for the five-year accident history. The Facility indicated that it had coordinated emergency response actions with local emergency planning and response organizations.

¹⁰ VALERO-AR-EPA-RMP-000660 - VALERO-AR-EPA-RMP-000712

¹¹ The Facility's Risk Management Plan Documentation was prepared by TRICORD Consulting, LCC. on August 2021, approximately sixteen months after the Facility's most recent RMP submission on April 15, 2020.

¹² VALERO-AR-EPA-RMP-000660 - VALERO-AR-EPA-RMP-000712

The EPA inspection team did not identify any potential AOCs in relation to this program element.

40 CFR § 68.15 – Management Systems

The Facility has developed a management system to oversee implementation of the RMP elements. The Vice President of Refining oversees the Risk Management Program, and each program element is assigned to various directors or managers. An organizational chart shows the positions responsible for each RMP element and the reporting structure of the overall program.¹³

The EPA inspection team did not identify any potential AOCs in relation to this program element.

40 CFR § 68.22 – Off site Consequence Analysis (OCA)

The Facility's April 15, 2020 RMP Submission lists one WCS for toxics, one WCS for flammables, one Alternative Release Scenario (ARS) for toxics, and one ARS for flammables for its RMP P3 covered processes. Additionally, the April 2020 RMP submission provides WCS for each of its seven P1 covered process. The Facility used EPA's RMP*Comp to model the WCS and ARS for toxics and EPA's OCA Guidance References Tables or Equations to model WCS and ARS for flammables.

In response to EPA's request for the OCA support documentation required under 40 CFR § 68.39, the Facility provided a document titled, Risk Management Plan Documentation. This document was prepared by TRICORD Consulting, LCC. and dated August 2021, approximately sixteen months after the Facility's most recent RMP submission on April 15, 2020.¹⁴

The August 2021 Risk Management Plan Documentation indicates that the Facility modeled and reported one toxic WCS for a HF release from the rapid acid deinventory tank (V-958) in the HF Alky Unit (RMP Process ID 1000103728) as well as one alternative release scenario (ARS) from a 2.5-inch diameter leak in the wall of V-958. The Facility did not assume any mitigation measures when calculating the distance to endpoint for the WCS or ARS.¹⁵

The August 2021 Risk Management Plan Documentation indicates that the Facility's WCS for flammables involved a loss of containment and resultant Vapor Cloud Explosion (VCE) from butane Tank 140, which is the largest vessel in LPG West (RMP Process ID 1000103734).¹⁶ The ARS was modeled as a leak in the seal of pump P-1050 resulting in a butane release from Tank 140 and VCE. The WCS and ARS did not consider any mitigation measures.¹⁷

¹³ See RFI Response #4, VALERO-AR-EPA-RMP-000659

¹⁴ VALERO-AR-EPA-RMP-000660 - VALERO-AR-EPA-RMP-000712

¹⁵ See RFI Responses #5, EPA Upload RMP Sections 2 through 5.pdf and RMP Submittal 093024 - Sections 2.3 and 2.4.pdf

¹⁶ VALERO-AR-EPA-RMP-000660 – VALERO-AR-EPA-RMP-000712

¹⁷ VALERO-AR-EPA-RMP-000713 - VALERO-AR-EPA-RMP-000726

The August 2021 Risk Management Plan Documentation indicates that the Facility defined offsite populations using EPA's Mapping Application for Response, Planning, and Local Operational Tasks (MARPLOT) and 2010 Census data. However, the affected residential population for the toxic WCS provided in the Risk Management Plan Documentation (43,354) differed from the population reported in the Facility's April 2020 RMP Submission (39,507). As a result, the provided supporting documentation does not appear to reflect the data and/or methods used to estimate the affected offsite population for the toxic WCS in the April 2020 RMP submission. Valero updated its RMP OCS on April 7, 2025, and included a population total of 39,507.

The EPA inspection team has identified **AOC 1** at the end of this inspection report for this program element.

40 CFR § 68.42 – Five Year Accident History

The Facility did not report any accidents in its April 15, 2020 RMP submittal. The EPA inspection team did not identify any accidents meeting the requirements for reporting.

The EPA inspection team did not identify any potential AOCs in relation to this program element.

40 CFR § 68.65 – Process Safety Information (PSI)

The Facility maintains process safety information (PSI) for the entire Facility in an electronic system, which is accessible to all employees. The PSI includes process flow diagrams, safety data sheets, descriptions of process chemistry, maximum intended inventories, cause and effect diagrams, consequences of deviation, electrical classification drawings, relief and ventilation system design bases, design codes and standards, and material and energy balances. The Facility also maintains P&IDs for all equipment as well as documentation of safety systems employed at the Facility. The Facility refers to a list of American Petroleum Institute (API) standards and corporate design standards to ensure equipment is made of adequate materials.

During the inspection, the EPA inspection team interviewed Facility personnel on the mitigation systems used in its HF Alky Unit. These mitigation systems include HF detectors, acid-detecting paint, a water curtain, elevated remote-controlled monitors, fire monitors, cameras, and a rapid acid transfer (RAT) system. Design requirements for critical trips and alarms are specified in Design and Engineering Practice, 32.8.10.10, Critical Instrumentation for HF Alkylation Units.¹⁸ Additionally, the Facility has an alarm management program to ensure that the alarm system helps operators take the correct action at the correct time.¹⁹

The Facility has five Boreal open-path laser detectors that create paths along the HF Alky Unit perimeter. The perimeter detectors have a range of 0-500 ppm-m and are set to high alarm at 75 ppm-m. The Facility also has ten individual point source detectors located inside the HF Alky

¹⁸ VALERO-AR-EPA-RMP-008866 – VALERO-AR-EPA-RMP-008895

¹⁹ VALERO-AR-EPA-RMP-008726 - VALERO-AR-EPA-RMP-008772

Unit battery limit. The point source detectors have a range of 0-10 ppm and are set to high alarm at 5 ppm.²⁰ A high alarm on any of the point or perimeter detectors results in an alarm on the Distributed Control System (DCS) display in the central control room and operator shelter as well as activation of lights and horns in the field.²¹

There are several cameras located within the HF Alky Unit that allow operators to view various areas (e.g., HF alky truck unloading area) remotely from either the central control room or the operator shelter. Additionally, the Facility has a manual RAT system that may be activated from either the operator console or from field panels within the unit.²² A water curtain surrounds the HF Alky Unit battery limits and can be activated from a pull button on the operator console or from field panels within the unit. The elevated, remote-controlled monitors also protect the unit. Additionally, the HF Alky Unit also has several fixed fire water monitors, including one that can be directed at the RAT storage tank, which is located outside of the fire curtain. Deployment of any of the safety showers or eyewash stations within the HF Alky Unit activates an alarm on the DCS display as well as visual and audible alarms (i.e., lights and horns) in the field.

The EPA inspection team requested the two most recent HF Alky Unit audits conducted pursuant to API Recommended Practice (RP) 751, *Safe Operation of Hydrofluoric Acid Alkylation Units*. The Facility provided API RP 751 audits dated December 2019 and January 21, 2023. API RP 751 (2021), Section 4.2.2 states that “each operating unit shall be audited at least every 3 years.” As a result, the January 21, 2023 audit was approximately one month overdue.

During the walkthrough of the Facility on January 28, 2025, the EPA inspection team identified inconsistencies between P&IDs and the equipment observed in the field. For example, in the HF Alky Unit truck unloading area, the EPA inspection team observed a bleeder valve on a P&ID that was not present in the field and a flange present in the field that was not present on the P&ID (drawing number D-90-0033, revision 26²³ and photograph 18 of Attachment 4). In LPG West, near butane sphere TK-140, the EPA inspection team observed a local PI in the field that was not present on the P&ID (see drawing number D-100-0122, revision 16²⁴ and photograph 25 of Attachment 4), two bleeder valves in the field that were not present on the P&ID (see drawing number D-100-0122, revision 16²⁵ and photograph 29 of Attachment 4), and two missing car seals (see drawing number D-100-0122, revision 16²⁶ and photographs 26 and 28 of Attachment 4). The EPA inspection team observed that new car seals were re-installed on these valves by Valero personnel as a corrective measure during the field inspection (see photographs

²⁰ Valero Refinery Company-Oklahoma dba Valero Ardmore Refinery January 28, 2025 Information Request Related to EPA’s CAA 112r Inspection

²¹ VALERO-AR-EPA-RMP-008866 – VALERO-AR-EPA-RMP-008895

²² VALERO-AR-EPA-RMP-008866 – VALERO-AR-EPA-RMP-008895

²³ VALERO-AR-EPA-RMP-002173

²⁴ VALERO-AR-EPA-RMP-002186

²⁵ VALERO-AR-EPA-RMP-002186

²⁶ VALERO-AR-EPA-RMP-002186

37 and 38 of Attachment 4). See the **Field and Initial Observations** section of the inspection report for additional information.

Additionally, during the field walkthrough on January 28, 2025, the EPA inspection team identified process piping throughout the Facility, particularly in the HF Alky Unit that was not sufficiently labeled or color-coded to indicate the contents or direction of flow per ASME A13.1 (2023). For example, the HF piping (piping line 1”P900391-HF2) that connects the depropanizer receiver (V-905) to the acid storage drum (V-902) was not labeled to indicate its contents, nor was it labeled to indicate direction of flow. Flanges in the line were painted yellow as a detection tool, however, the piping itself was not color-coded to indicate contents (see photograph 18 of Attachment 4).

The EPA inspection team has identified **AOCs 2 through 4** at the end of this inspection report for this program element.

40 CFR § 68.67 – Process Hazard Analysis (PHA)

The Facility maintains a Process Hazard Analysis (PHA) procedure (PSM-003), for conducting process hazard analyses.²⁷ This procedure establishes standards, guidance, and minimum requirements for the development and implementation of PHA programs. The procedure requires that all PHAs involving a new process/facility, existing process, or revalidation use either the What-if/Checklist or Hazard and Operability (HAZOP) methodology. The procedure requires PHAs to be revalidated every five years, and establishes requirements for the PHA team make-up, facilitator qualifications, action items, reports, action item tracking, and access to PHA records. While the Facility can conduct PHAs in-house, they typically bring in a third-party contractor to assist with facilitating PHAs.

The EPA inspection team requested and received the two most recent PHAs for the HF Alky Unit, FCCU, and LPG Storage West. The HF Alky Unit PHAs were most recently completed in 2018 and 2023. The FCCU and LPG Storage West PHAs were most recently completed in 2014 and 2019. The Facility did not provide the 2024 PHAs for the FCCU and LPG Storage West at the time of the inspection and indicated that the PHA reports were still in draft form. The Facility provided the 2024 FCCU and LPG Storage West PHAs in a supplemental production on April 17, 2025.

The 2019 LPG Storage West PHA was finalized on August 19, 2019 and the 2024 LPG Storage West PHA was finalized on March 14, 2025.^{28,29} The Facility did not complete the revalidation reports for the 2024 LPG Storage West PHA within the required five-year interval.

The EPA inspection team also requested the status of recommendations from the two most recent PHAs for the HF Alky Unit, FCCU, and LPG Storage West. The EPA inspection team received recommendation tracking tables for the 2018 and 2023 HF Alky PHAs; the 2019 and

²⁷ See RFI Response #8, VALERO-AR-EPA-RMP-000794 – VALERO-AR-EPA-RMP-000819

²⁸ 2019 LPG Storage West PHA, VALERO-AR-EPA-RMP-007465 – VALERO-AR-EPA-RMP-007753.

²⁹ 2024 LPG Storage West PHA, VALERO-AR-EPA-RMP-010288 - VALERO-AR-EPA-RMP-010589

2024 FCCU and LPG Storage West PHAs; and the 2014 LPG Storage West PHA.³⁰ For the HF Alky Unit, the EPA inspection team noted that the Facility had voluntarily initiated a re-evaluation of a subset of the recommendations identified during the 2018 PHA in January 2021. Facility personnel did not provide additional context for why this re-evaluation was initiated; however, the assigned risk categories for certain recommendations were revised as part of this January 2021 re-evaluation. The Facility did not provide the 2014 FCCU PHA.

The 2018 HF Alky Unit PHA resulted in twenty-nine (29) recommended actions, of which eighteen (18) have been closed, eight (8) have been declined, and three (3) are in-process. The closed actions have been addressed and completed in a timely manner. Declined actions have been re-evaluated either in January 2021 or in the most current 2023 PHA for the HF Alky Unit. Of the actions re-evaluated in either January 2021 or in the most current 2023 PHA for the HF Alky Unit, the Facility provided justification for the action's rejection in a document titled 2018 ALKY Findings, Recommendations, Action Items and Closure. The in-process action items are due to be addressed by no later than December 2025. The 2023 HF Alky Unit PHA resulted in thirty (30) recommended actions, of which twenty-three (23) have been addressed, two (2) have been declined, and five (5) are in-process. The closed actions have been addressed and completed in a timely manner. The Facility provided justification for the action's rejection in a document titled 2023 ALKY Findings, Recommendations, Action Items and Closure. Four (4) of the in-process action items are due to be addressed by no later than December 2025. One (1) of the in-process action items (AI 467801) exceeded its initial assigned due date (January 14, 2025) and the Facility has not provided a justification as to why.

The Facility did not provide the status of the two (2) recommendations from the 2014 FCCU PHA at the time of the inspection. The 2019 FCCU PHA resulted in nine (9) recommended actions, of which six (6) have been closed, two (2) have been declined, and one (1) is in-process. The Facility did not provide dates for the closure or declination of actions during the inspection. The in-process action (AI 432247) has had its due date adjusted without justification.

The 2014 LPG PHA resulted in one (1) recommended action, which has been closed. The Facility did not provide a closure date for this action. The 2019 LPG PHA resulted in five (5) recommended actions, which have been closed. The Facility only provided a closure date for one (1) of these actions at the time of this inspection.

Recommended actions from PHAs are tracked by [REDACTED], Refinery Process Safety Manager who works with the PHA team to assign a responsible party and due date for each action and coordinate recurring bi-monthly action item review meetings. Facility management communicates actions to operating, maintenance, and other employees whose work assignments may be affected by recommendations during daily or weekly meetings. Final PHA reports and recommendation forms are uploaded to the Facility's intranet so that affected employees can access this information at all times.

³⁰ See RFI Response #26, VALERO-AR-EPA-RMP-00265 – VALERO-AR-EPA-RMP-007757; VALERO-AR-EPA-RMP-010281 - VALERO-AR-EPA-RMP-010287; VALERO-AR-EPA-RMP-010599 - VALERO-AR-EPA-RMP-010604

The EPA inspection team has identified **AOCs 5 and 6** at the end of this inspection report for this program element.

40 CFR § 68.69 – Operating Procedures

The Facility has developed written operating procedures that include instructions to safely startup, shutdown, and maintain normal operations. Included in the operating procedure is an overview section that gives the purpose of the operating procedure, associated safety and environmental precautions, references, and prerequisites. Some procedures include additional information in the overview section, such as immediate actions for emergency response procedures.

The Facility maintains an Operating Procedure Guideline, which outlines the minimum acceptable practices for developing, maintaining, and using operating procedures.³¹ The Facility uses the electronic system, Policy Tech, to maintain operating procedures and provide employee access to published procedures. Operating procedures are reviewed annually and updated if needed. The Facility uses the review process in PolicyTech to certify that operating procedures are current and accurate following the annual review.³²

The EPA inspection team requested and reviewed emergency shutdown procedures for the HF Alky Unit, FCCU, and LPG Storage West, as well as operating procedures for unloading HF from delivery containers for the HF Alky Unit. Emergency operating procedures provided by the Facility fail to mention the safe operating limits when an emergency is present. For example, the operating procedure ALKY-EP-0706, Loss of Cooling Water, includes as a caution on Page 2, “Try to maintain adequate heat in bottom of Isostripper tower to keep acid lifted up the tower. Do not over-fire and over-pressure Isostripper tower.”³³ The procedure fails to include safe operating temperature and pressure limits. Another example is in operating procedure ALKY-EP-0731, HF Alkylation Unit Rapid Acid Dump Emergency Procedure, which specifically mentions on Page 1 that, “During a RAD, normal operating parameters should be maintained in the isostripper. IF the isostripper heater and tower must be shutdown and the system pressure falls below a predetermined set point, HP natural gas must be added to the system and the tower pressure monitored closely.”³⁴ This procedure fails to include the minimum safe operating pressure that an operator should monitor for and only states normal operating parameters should be maintained, which are not specified in the procedure itself. Operating procedure ALKY-EP-0766, Propane Defluorinators/KOH Treater Temperature Excursion (Exotherm), informs operators on a temperature excursion in the Propane Defluorinators or Propane KOH Treater in the HF Alkylation Unit.³⁵ Specifically, Page 1 states that elevated temperatures are an indication of an exothermic reaction and immediate steps must be taken to mitigate the incident. The procedure fails to clearly state the safe operating temperature

³¹ VALERO-AR-EPA-RMP-000828 – VALERO-AR-EPA-RMP-000842

³² VALERO-AR-EPA-RMP-000827

³³ VALERO-AR-EPA-RMP-007887 - VALERO-AR-EPA-RMP-007888

³⁴ VALERO-AR-EPA-RMP-007914 - VALERO-AR-EPA-RMP-007932

³⁵ VALERO-AR-EPA-RMP-007966 - VALERO-AR-EPA-RMP-007968

limits expected and what threshold would indicate an elevated temperature. Instead, consequences of deviations are maintained in separate documentation that are not directly referenced in the procedures.

Additionally, Facility emergency response procedures fail to include clear steps on how to activate safety systems and their specific functions. For example, the operating procedure ALKY-EP-0711, Alky Unit Fire, Leak, or Rupture, states in steps 1 through 3 to “activate the emergency response system,” “activate the leak mitigation water curtain,” and to “activate the Rapid Acid Dump (RAD) system.”³⁶ The procedure fails to include clear steps on how to activate these mitigation systems nor does it refer to other operating procedures that specify how to activate these safety systems, such as operating procedure ALKY-EP-0731, HF Alkylation Unit Rapid Acid Dump Emergency Procedure.³⁷

Further, Facility emergency response procedures that mention personnel injury due to HF exposure fail to mention the need for and location of emergency medical treatment and do not refer to the Facility’s Operating Procedure ALKY-EP-0768, HF Acid Release and Response.³⁸ Policy SHG A-04 is referenced in ALKY-EP-0768, HF Acid Release and Response, however, a copy of this policy was not provided at the time this inspection report was drafted. Where HF exposure is possible, the emergency response procedures only state that personnel should wear proper Personal Protective Equipment (PPE) but fail to specify the appropriate level/type of PPE. Operating procedure ALKY-EP-0752, V-906 Condensate Drum Emergency Operating Procedure, informs employees of the emergency operating procedures of an HF Acid leak into the condensate return header.³⁹ On Page 1, the procedure specifically states that if an acid leak is present in the condensate system, condensate from the condensate drum will be low pH material and that operators should wear proper PPE when working in the area. The procedure does not specify the type of PPE required for handling low pH material, nor does it provide information on HF exposure and/or associated details regarding emergency medical treatment. Operating procedure ALKY-EP-0760, Checking Alky Unit Cooling Water Exchangers for Hydrocarbon/HF Acid Leaks, fails to mention the need for and location of emergency medical treatment.⁴⁰ The procedure informs employees on how to monitor the cooling water exchanger for HF acid leaks but only states that employees wear proper PPE and that extreme caution be used in and around the area due to the possibility of HF, fluorides, and low pH material. The procedure does not state what to do in the event of an HF acid exposure such as necessary medical treatment.

In the Facility’s Operating Procedure ALKY-EP-0768, HF Acid Release and Response, information such as the level of PPE and the name of the local hospital or clinic is stated.⁴¹ However, on step 14 of the procedure, the procedure does not clearly state the type of medical treatment or

³⁶ VALERO-AR-EPA-RMP-007892 - VALERO-AR-EPA-RMP-007893

³⁷ VALERO-AR-EPA-RMP-007914 - VALERO-AR-EPA-RMP-007932

³⁸ VALERO-AR-EPA-RMP-007972 - VALERO-AR-EPA-RMP-007984

³⁹ VALERO-AR-EPA-RMP-007935 - VALERO-AR-EPA-RMP-007936

⁴⁰ VALERO-AR-EPA-RMP-007944 - VALERO-AR-EPA-RMP-007946

⁴¹ VALERO-AR-EPA-RMP-007972 - VALERO-AR-EPA-RMP-007984

refer to a medical treatment/decontamination procedure that needs to be conducted in the event of an HF acid exposure, nor the contact information of Valero Medical or Mercy Hospital which are the closest hospitals with relevant HF burn care experience.

The EPA inspection team identified **AOCs 7 through 9** at the end of this inspection report for this program element.

40 CFR § 68.71 – Training

The Facility has developed a training program to onboard new employees and provide continuous training to tenured employees. Technical Trainer, [REDACTED], maintains training records for all employees electronically via the learning management system (LMS). The Facility provides a 12-week, 40-hour per week basic operator training (BOT) for new operators. Topic areas include health, safety & security, process fundamentals, maintenance, environmental, emergency response, and other general topics. Training programs use a mix of computer-based training (CBT) and/or on-the-job training, and certification may require completing knowledge verifications (KVs) and performance verifications (PVs). KVs are written assessments while PVs are field tests of specific job tasks. Upon completion of BOT, new employees may elect to participate in Craft Training, which are training programs designed to develop employees within a specific position, such as pipefitting. Craft Training programs have curriculum levels that establish baseline levels of knowledge in specific topic areas that progress from CBTs to KVs and PVs.

Once assigned to a unit, new operators begin on-the-job training on specific jobs within that unit. After approximately 45 days of on-the-job training, the new operator completes a walkthrough, checklist, drawing assessment, and computer-based training to fully qualify for that job. Operators must certify on the outside jobs within an operating unit before becoming eligible to train as board operators. Operators maintain their training requirements by completing required refresher training every three years. The LMS system tracks the required frequency of trainings and will automatically notify employees when refresher training is coming due.

The Facility provided training records for three HF Alky Unit operators.⁴² One operator, [REDACTED], has a lapsed refresher training for Complex III – ALKY – Treaters Operator – Initial, which expired on May 3, 2021. The Facility did not provide documentation that [REDACTED] completed their required refresher training for Complex III.

The EPA inspection team has identified **AOC 10** at the end of this inspection report for this program element.

40 CFR § 68.73 – Mechanical Integrity

The Facility implements a mechanical integrity (MI) program that covers fixed equipment (e.g., process piping, pressure vessels), rotating equipment (e.g., pumps, compressors), and

⁴² See RFI Response #2-27, VALERO-AR-EPA-RMP-009327

instrumentation, analyzers, control systems, and electrical equipment. The EPA inspection team requested and reviewed written procedures for the Facility's MI program, which included the Reliability Group Standards,⁴³ Inspection Program Management Standard,⁴⁴ Inspection Manual for Fixed Equipment (Table of Contents),⁴⁵ Predictive Maintenance Monitoring Programs for Rotating Equipment (RE123),⁴⁶ and Maintenance of Critical Instrumentation (PACE-MNT-1).⁴⁷

The Facility's reliability group consists of two reliability managers, one for fixed and rotating equipment and one for instrumentation, analyzers, electrical equipment, and control systems. The reliability managers oversee a team of reliability engineers and inspectors. The Facility has a separate maintenance group for the planning and execution of maintenance tasks that includes both Valero employees and contractors. The maintenance group consists of electricians, instrument technicians, rotating equipment specialists, pipe fitters, and welders. Planned and unplanned maintenance requests are prioritized according to safety, environmental, and operational risks.⁴⁸

The Facility stores inspection records in Plant Condition Monitoring Software (PCMS), which also tracks corrosion rates, corrosion mechanisms, and calculates risk-based inspection intervals. The Facility uses the Systems, Applications, and Products (SAP) software package to manage maintenance plans and the Routine Maintenance Excellence System (RMES) to manage and prioritize maintenance work orders.

Fixed Equipment

The Facility manages the reliability of fixed equipment in most of its covered processes according to API RP 580, *Elements of a Risk Based Inspection (RBI) Program*. RBI allows the Facility to use information on specific damage mechanisms to set equipment inspection intervals.⁴⁹ The Facility manages equipment in its HF Alky Unit according to API RP 751, *Safe Operation of Hydrofluoric Acid Alkylation Units*.

During the inspection, reliability manager, [REDACTED], and reliability engineer, [REDACTED], provided the EPA inspection team with a PCMS walkthrough to demonstrate the implementation of the Facility's MI program for fixed equipment. The EPA inspection team randomly selected vessels, piping, and other equipment in the HF Alky Unit, including V-918 #1 HF settler, T-902 #2 HF settler, piping circuit CL-18 from the HF Alky truck unloading station to the fresh acid tank, HF regenerator T-903, CL-17 fresh acid piping circuit 18-01DL, and fresh acid pump P-903. The EPA inspection team also selected the cat feed hydrotreater (CFHT) charge

⁴³ VALERO-AR-EPA-RMP-001063 - VALERO-AR-EPA-RMP-001072

⁴⁴ VALERO-AR-EPA-RMP-001035 - VALERO-AR-EPA-RMP-001058

⁴⁵ VALERO-AR-EPA-RMP-001059 - VALERO-AR-EPA-RMP-001062

⁴⁶ VALERO-AR-EPA-RMP-008685 - VALERO-AR-EPA-RMP-008688

⁴⁷ VALERO-AR-EPA-RMP-008685 - VALERO-AR-EPA-RMP-008688

⁴⁸ VALERO-AR-EPA-RMP-008907 - VALERO-AR-EPA-RMP-008908

⁴⁹ See Risk Based Inspection Procedural Manual, QA-GEN-VT34.pdf

pump P-6501 in the FCCU.⁵⁰ The EPA inspection team viewed inspection schedules, inspection reports, and results of previous testing events for this equipment. The EPA inspection team requested specific inspection/testing records for offsite review. At the time of the EPA inspection, the Facility indicated that it did not have any equipment in the HF Alky Unit, FCCU, or LPG Storage West that was overdue for inspection.⁵¹

HF Regenerator, T-903

The EPA inspection team requested inspection and testing records for the HF regenerator (T-903) dating back to 2005, after discussions revealed that this vessel has had ongoing corrosion issues. T-903 was constructed in 1986 of SB-127 (400 Monel) and is in HF acid/isobutane service. During the April 2005 turnaround, the Facility replaced a four-foot section of the vessel, between the center of the shell and the bottom head, due to pronounced corrosion and a hole that was previously lap-patched.⁵² A November 2005 analysis of material removed from the vessel (e.g., corroded tray clips and bolts) indicated that the corrosion was likely related to high temperature excursions (to 350 °F) within the reactor.⁵³

The Facility's HF Alkylation Unit Inspection Corrosion & Cracking Inspection Basic Practice for Zone 1 Pressure Vessels (Phase Change HF) requires on-stream thickness inspections every five (5) years, external visual inspections every five (5) years, and internal inspections every turn around interval.⁵⁴ Internal inspections of T-903 were conducted during the March 2011⁵⁵ and September 2018⁵⁶ turnarounds, and on both occasions the vessel shell was found to be in acceptable condition. External visual inspections were performed in June 2008,⁵⁷ November 2012,⁵⁸ November 2016,⁵⁹ and October 2021.⁶⁰ The November 2012 inspection noted several deficiencies, including deterioration of the foundation grout resulting in the exposure of reinforcing steel elements, missing continuous monitoring location (CML) ports in the insulation jacketing, and loose fasteners on the vessel ladder.⁶¹ The inspection report indicated that work orders had been opened to correct these deficiencies. However, the subsequent November 2016 external inspection indicated that the work orders were never completed and that there

⁵⁰ VALERO-AR-EPA-RMP-008692 - VALERO-AR-EPA-RMP-008694.pdf

⁵¹ Valero's January 10, 2025 response to EPA's November 25, 2024 Information Request Related to EPA's CAA 112r Inspection

⁵² VALERO-AR-EPA-RMP-008916 - VALERO-AR-EPA-RMP-008917

⁵³ VALERO-AR-EPA-RMP-009416 - VALERO-AR-EPA-RMP-009424

⁵⁴ VALERO-AR-EPA-RMP-009396

⁵⁵ VALERO-AR-EPA-RMP-008921 - VALERO-AR-EPA-RMP-008923

⁵⁶ VALERO-AR-EPA-RMP-008943 - VALERO-AR-EPA-RMP-008949

⁵⁷ VALERO-AR-EPA-RMP-008918 - VALERO-AR-EPA-RMP-008920

⁵⁸ VALERO-AR-EPA-RMP-008928 - VALERO-AR-EPA-RMP-008935

⁵⁹ VALERO-AR-EPA-RMP-008937 - VALERO-AR-EPA-RMP-008940

⁶⁰ VALERO-AR-EPA-RMP-008950 - VALERO-AR-EPA-RMP-008954

⁶¹ VALERO-AR-EPA-RMP-008928 - VALERO-AR-EPA-RMP-008935

were continued issues with the vessel foundation, missing CML ports, and loose fasteners.⁶² These issues were resolved prior to the next external inspection in October 2021.

The Facility conducted external ultrasonic thickness (UT) testing on T-903 in April 2011,⁶³ June/July 2012,⁶⁴ August 2015, May/June 2017,⁶⁵ May 2022,⁶⁶ and January 2024.⁶⁷ Records show four CMLs on the previously replaced bottom half of the shell and four CMLs on the top half of the shell, although all CMLs were not tested during every UT inspection.

In July 2024, the Facility conducted an RBI revalidation for T-903 as part of a broader revalidation effort for the HF Alkylation Unit ahead of the planned unit turnaround in 2025. The initial RBI for T-903 considered one circuit, consisting of the shell, heads, and nozzles. All applicable damage mechanisms and monitoring locations were assigned to that one circuit. During the revalidation, the Facility split T-903 into two circuits consistent with updated API RP 751 corrosion zones: a top circuit (warm acid regenerator overhead and regenerator acid feed) and a bottoms circuit. This split increased the number of shell data points and prompted an automated ultrasonic testing (AUT) inspection.⁶⁸

In November 2024, the Facility engaged with a third-party contractor to complete an AUT examination of T-903 to evaluate wall loss in a six-foot area near the bottom of the vessel, after technicians identified some low readings in this area.⁶⁹ AUT readings revealed significant wall loss in the bottom portion of the vessel. The Facility conducted fitness for service calculations using PlantManager, an asset lifecycle assessment and management tool, and derated the vessel pressure safety valve (PSV) from 200 psi to 160 psi to protect the vessel in the event of additional wall loss. The Facility also ordered a bolt-on clamp to enclose the damaged area and plans to monitor local areas on a weekly basis until repairs can be made during the 2025 outage.⁷⁰

Alky Flare Line #R2 off T-901

The EPA inspection team requested inspection and testing records for alky flare line #R2 off T-901, dating back to 2005, after discussions revealed that the line has had ongoing corrosion issues. The Facility indicated that PCMS data for 2005-2008 had been archived, but inspections from 2009-2016 did not reveal any issues and no line repairs were made during this time. The Facility identified corrosion in the line during a 100% component verification in 2017, but determined it was acceptable to operate the line until the 2018 turnaround. The line was

⁶² VALERO-AR-EPA-RMP-008937 - VALERO-AR-EPA-RMP-008940

⁶³ VALERO-AR-EPA-RMP-008924 - VALERO-AR-EPA-RMP-008927

⁶⁴ VALERO-AR-EPA-RMP-008936

⁶⁵ VALERO-AR-EPA-RMP-008941 - VALERO-AR-EPA-RMP-008942

⁶⁶ VALERO-AR-EPA-RMP-008955

⁶⁷ VALERO-AR-EPA-RMP-008956

⁶⁸ VALERO-AR-EPA-RMP-009822 - VALERO-AR-EPA-RMP-009826

⁶⁹ VALERO-AR-EPA-RMP-009397 - VALERO-AR-EPA-RMP-009412

⁷⁰ VALERO-AR-EPA-RMP-009413 - VALERO-AR-EPA-RMP-009415

replaced during the 2018 turnaround. The line developed a leak in 2019 and the Facility installed a wrap as a temporary repair.⁷¹ The Facility encapsulated the line in 2020 and the line is scheduled to be replaced during the 2025 turnaround.⁷² The Facility indicated that the flare line corrosion was caused by various operational upsets that were corrected in March 2021, including increased load to the flare due to non-condensables in the purchased isobutane feed, insufficient neutralization of the acid in the flare line due to scrubber tray failure and poor potassium hydroxide circulation, and poor drainage of the flare line.⁷³

The Facility's Hydrofluoric (HF) Alkylation Unit Inspection Corrosion & Cracking Inspection Best Practice indicates that alky flare line #R2 off T-901 should be subject to external visual inspections every five years and on-stream thickness measurements every five years.⁷⁴ The Facility provided documentation of external visual inspections conducted in December 2009⁷⁵ and August 2014.⁷⁶ The 2009 external visual inspection noted that the dummy leg supporting the line did not have a weep hole and that the line had 50% coating failure. The inspection report made recommendations to correct these deficiencies.⁷⁷ However, the subsequent 2014 external inspection found that these recommendations had not been completed.⁷⁸ The Facility did not provide any external visual inspection records after 2014 at the time of the inspection.

The Facility provided documentation of external thickness testing conducted in October 2009,⁷⁹ March-October 2013,⁸⁰ and March 2017-March 2018.⁸¹ The Facility did not provide any external thickness testing records after 2017-2018. Valero's policy is to conduct visual inspections after a temporary repair, such as a clamp, is in place. Valero stated that the line was replaced during the 2025 turnaround, however, documentation of the line replacement was not provided.

Rotating Equipment

The Facility maintains the Predictive Maintenance Monitoring Programs standard for vibration, compressor, and lube oil analysis of its rotating equipment to increase reliability and reduce the risk of operating failures.⁸² The Facility has continuous vibration monitoring systems for four critical compressors – the two FCCU main air blowers, the FCCU wet gas compressor, and the cat feed recycle compressor. Vibration readings for all other rotating equipment at the Facility,

⁷¹ VALERO-AR-EPA-RMP-009413 - VALERO-AR-EPA-RMP-009315

⁷² VALERO-AR-EPA-RMP-009413 - VALERO-AR-EPA-RMP-009315

⁷³ Valero's February 21, 2025 Response to EPA's January 29 and 30, 2025 Information Requests

⁷⁴ VALERO-AR-EPA-RMP-009396

⁷⁵ VALERO-AR-EPA-RMP-009303 - VALERO-AR-EPA-RMP-009306

⁷⁶ VALERO-AR-EPA-RMP-009309 - VALERO-AR-EPA-RMP-009313

⁷⁷ VALERO-AR-EPA-RMP-009303 - VALERO-AR-EPA-RMP-009304

⁷⁸ VALERO-AR-EPA-RMP-009309 - VALERO-AR-EPA-RMP-009313

⁷⁹ VALERO-AR-EPA-RMP-009307

⁸⁰ VALERO-AR-EPA-RMP-009308

⁸¹ VALERO-AR-EPA-RMP-009314

⁸² VALERO-AR-EPA-RMP-008685 - VALERO-AR-EPA-RMP-008688

including the pumps in the HF Alky Unit, are collected on a bi-weekly to monthly basis during unit rounds. Based on the continuous monitoring practices currently employed by Valero, the Facility does not appear to follow the API RP 751 recommendation to use remote monitoring on high-risk pumps in the HF Alky Unit. Specifically, Section 6.5.7 of API RP 751 (2021) states that, “Pumps in rich HF, fresh HF, and phase change HF services shall have monitoring for early indication of bearings and seal failures. This monitoring should be performed remotely.”

Detailed vibration analyses are conducted by a third-party contractor, CSI Emerson.⁸³ The Facility also tracks bad actors, defined as rotating equipment with more than two identified failures in a twenty-four-month period.

Instrumentation and Electrical

The Facility uses Valero’s Corporate Process Safety Standard for the Maintenance of Critical Instrumentation.⁸⁴ The standard defines “how” and “when” critical instruments are to be tested and includes information on instrument calibration, calibration checks, function checks, testing, internal inspection, and visual inspection.

The Facility’s SAP maintenance plan for the ten (10) HF point source detectors within the HF Alky Unit specifies a quarterly (i.e., 12-week) maintenance cycle. Quarterly preventative maintenance (PM) for the HF point source detectors includes a visual inspection and instrument calibration.⁸⁵ The EPA inspection team requested the last five years of calibration and testing records for the HF point source detectors. The Facility provided calibration records for calendar year 2024. Records for the first quarter of 2024 (records dated to January 23, 2024 and 25, 2024) indicate that the Facility did not perform the required PM because the Facility was ordering a new analyzer that would enable the Company to conduct calibration on the newer model.⁸⁶ The Facility provided calibration records for the second quarter of 2024 (July 17, 2024) for four (4) of the ten (10) point source detectors (AI-906063, AI-906064, AI-906066, and AI-906067).⁸⁷ These records indicate that the Facility was once again unable to perform the required PM due to an analyzer fault and was ordering a new analyzer. Calibration records indicate that the point source detectors were successfully calibrated during the third and fourth quarters of 2024 (records dated to October 10, 2024 and 17, 2024 and December 27, 2024) when the sensors were replaced with a technology capable of being calibrated.⁸⁸

The Facility’s SAP maintenance plan for its five (5) Boreal laser gas cell HF perimeter detectors specifies a quarterly preventative maintenance cycle. Preventative maintenance on the perimeter detectors includes visual inspection, calibration, and functional testing.⁸⁹ The EPA

⁸³ VALERO-AR-EPA-RMP-008685 - VALERO-AR-EPA-RMP-008688

⁸⁴ VALERO-AR-EPA-RMP-008685 - VALERO-AR-EPA-RMP-008688

⁸⁵ VALERO-AR-EPA-RMP-008859

⁸⁶ VALERO-AR-EPA-RMP-008350 - VALERO-AR-EPA-RMP-008359

⁸⁷ VALERO-AR-EPA-RMP-008360 - VALERO-AR-EPA-RMP-008363

⁸⁸ VALERO-AR-EPA-RMP-008365 - VALERO-AR-EPA-RMP-008404

⁸⁹ VALERO-AR-EPA-008864

inspection team requested the last five years of calibration and testing records for the HF perimeter detectors. The Facility did not provide any records for calendar years 2020 and 2021. The Facility provided quarterly calibration and testing records for calendar years 2022 and 2023 and the third quarter of 2024 (dated August 13, 2024). It did not provide calibration records for the first, second, and fourth quarters of 2024.⁹⁰

The EPA inspection team identified potential **AOCs 11 through 16** at the end of this inspection report for this program element.

40 CFR § 68.75 – Management of Change (MOC)

The Facility maintains a Management of Change (MOC) Compliance Policy (PSM-010) that defines the requirements for managing changes to process chemicals, process technologies, process equipment, and procedures that affect processes at the Facility.⁹¹ The Facility tracks MOCs electronically using SAP-based software developed specifically for Valero. MOCs are initiated by a MOC champion. A MOC review team, consisting of a qualified representative from operations supervision and a technical representative, reviews the change and approves or rejects it. If approved, the MOC review team identifies the hazard review team. The hazard review consists of subject matter expert (SME) review and completion of either a what-if, checklist, or a formal HAZOP analysis for affected PHA nodes depending on the MOC class. The MOC review team also identifies appropriate SME reviewers, based on the type of change that is being reviewed, and a pre-startup safety review (PSSR) team leader. Required pre-startup actions include training and operating/maintenance procedure updates. The MOC champion is responsible for entering the required information into the Valero eMOC system, tracking the MOC to completion, and closing out the MOC.⁹²

The Facility's MOC program also delineates a process for temporary changes, through the temporary MOC process. All temporary changes have an expiration date of one year from the initiation of the change, which can be extended with approval from a person one level higher than the original change authorizer, following an engineering review to confirm that the temporary change is suitable for longer service.⁹³ The Facility also has an emergency MOC process for emergency changes necessary to prevent imminent safety or environmental impacts, equipment damage, or unit shutdown. In the event of an emergency MOC, the shift supervisor contacts the unit superintendent, or appropriate designee, for approval.⁹⁴

The Facility discusses temporary MOCs or actions items that are coming due within 30 days at routine PSM meetings. The PSM Manager also tracks MOCs that have been open for more than one year and audits its MOC process annually to improve the process.

⁹⁰ VALERO-AR-EPA-RMP-008342 - VALERO-AR-EPA-RMP-008364

⁹¹ VALERO-AR-EPA-RMP-001073 - VALERO-AR-EPA-RMP-001107

⁹² VALERO-AR-EPA-RMP-001073 - VALERO-AR-EPA-RMP-001107

⁹³ VALERO-AR-EPA-RMP-001073 - VALERO-AR-EPA-RMP-001107

⁹⁴ VALERO-AR-EPA-RMP-001073 - VALERO-AR-EPA-RMP-001107

The EPA inspection team did not identify any potential AOCs in relation to this program element.

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

As part of the Facility's MOC process, the PSSR team is responsible for reviewing and field verifying that changes were installed as approved in the MOC and sending the MOC back to the MOC champion if there are deviations from the original design. The PSSR team also verifies that the pre-startup action items are complete, post-startup action items are documented, training requirements are complete, and affected personnel (e.g., operations, maintenance, technical) have been notified. Once all post-startup action items have been completed, the MOC can be closed.⁹⁵

The EPA inspection team did not identify any potential AOCs in relation to this program element.

40 CFR § 68.79 – Compliance Audits

The Facility completed their most recent compliance audits in October 2021 and August 2024.^{96,97} Both compliance audits were conducted by an on-site team of Valero corporate employees and owners or operators of other Valero refineries with remote support from a third-party contractor, AcuTech Consulting Group. The 2021 compliance audit identified six (6) findings, two (2) pertaining to MI program elements, one (1) pertaining to MOC program elements, two (2) pertaining to Operating Procedure program elements, and one (1) pertaining to PSI program elements.⁹⁸ All findings and associated actions were completed before their assigned due date. The 2024 compliance audit identified nine (9) findings, four (4) pertaining to MI program elements, two (2) pertaining to MOC program elements, two (2) pertaining to PSI program elements, and one (1) pertaining to PSSR program elements. At the time of the inspection, the Facility indicated that all nine (9) actions are open. All nine (9) actions have due dates assigned with the latest completion date set for December 2025.⁹⁹ The Facility has determined and documented an appropriate response to each of the findings of the compliance audit along with appropriate personnel assigned to each action item.

The EPA inspection team did not identify any potential AOCs in relation to this program element.

40 CFR § 68.81 – Incident Investigation

The Facility maintains an Incident Reporting, Investigation, and Closure Safety & Health Guideline (SHG C-6) that defines the work process for incident and near miss reporting, incident

⁹⁵ VALERO-AR-EPA-RMP-001073 - VALERO-AR-EPA-RMP-001107

⁹⁶ VALERO-AR-EPA-RMP-001152 - VALERO-AR-EPA-RMP-001170

⁹⁷ VALERO-AR-EPA-RMP-001174 - VALERO-AR-EPA-RMP-001184

⁹⁸ VALERO-AR-EPA-RMP-001185 - VALERO-AR-EPA-RMP-001187

⁹⁹ VALERO-AR-EPA-RMP-001171 - VALERO-AR-EPA-RMP-001173

investigation, identification and implementation of corrective actions, analysis of incident trends, and communication to prevent reoccurrence. This guideline covers fires/explosions, injury/illness, loss of containment, process upsets, and unit shutdowns.¹⁰⁰ The Facility uses the Environmental, Health, and Safety Management (EHSM) electronic system for incident reporting and tracking. All incidents are evaluated by either a field review team or a formal incident investigation team. Incidents are categorized as either “near miss” or Category I, II, III, or IV, using a matrix that considers different incident types.¹⁰¹ Unless upgraded, all near miss and Category I incidents are investigated by a field team, while Category II, III, and IV incidents are evaluated by an incident investigation team using the ThinkReliability Cause Mapping Methodology. The Facility’s guideline requires investigations for Category II, III, IV and upgraded incidents be initiated within 48 hours of the incident and completed within 45 calendar days.¹⁰²

Section 2.8.2 of the Facility’s incident investigation guidelines states that incidents at Category II and above shall be investigated by the contractor; and a Valero site representative will be provided to the investigation team as deemed necessary. Additionally, all OSHA Process Safety Incidents involving contractors are led by a Valero employee with participation from the contractor company involved. Appendix G to the Facility’s incident investigation guidelines provides the Investigation Team Matrix and Guidelines. Section 2.3.2.3, which specifies the steps of the Refinery Leadership Team (RLT) to assign the investigation team leader and team, refers to Appendix G for investigation team requirements. Appendix G specifies the inclusion of the employee or contractors involved for near misses and category I events, but does not explicitly include contractors for applicable Category II, III, or IV incidents.¹⁰³ Information from incidents and near miss investigations are communicated to the Facility via email.

The EPA inspection team reviewed the incident investigation reports for several incidents, including a November 10, 2020 Category I incident involving a leak on E-032 (Incident ID 438378);¹⁰⁴ an April 22, 2022 Category III incident involving a CFHT charge pump area fire (Incident ID 456664);¹⁰⁵ a May 19, 2023 release from the PSV on Tanks 1, 2, and 3 in the HF Alky Unit (Incident ID 471426);¹⁰⁶ and a December 7, 2023 Category I incident involving fluoride scale on pump P-903 in the HF Alky Unit, indicating a release from the pump (Incident ID 479100).¹⁰⁷ None of the reviewed incident investigations included the date the investigation began. However, the Cause Map Template (Version 2.7), dated April 13, 2023, includes the investigation start date and time, and Facility personnel indicated that the template was recently updated to include this information.¹⁰⁸

¹⁰⁰ VALERO-AR-EPA-RMP-001188 - VALERO-AR-EPA-RMP-001209

¹⁰¹ VALERO-AR-EPA-RMP-001253 - VALERO-AR-EPA-RMP-001257

¹⁰² VALERO-AR-EPA-RMP-001188 - VALERO-AR-EPA-RMP-001209

¹⁰³ VALERO-AR-EPA-RMP-001258 - VALERO-AR-EPA-RMP-001259

¹⁰⁴ VALERO-AR-EPA-RMP-008334 - VALERO-AR-EPA-RMP-008335

¹⁰⁵ VALERO-AR-EPA-RMP-008336

¹⁰⁶ VALERO-AR-EPA-RMP-008338

¹⁰⁷ VALERO-AR-EPA-RMP-008340 - VALERO-AR-EPA-RMP-008341

¹⁰⁸ VALERO-AR-EPA-RMP-001265

The EPA inspection team identified potential **AOCs 17 and 18** at the end of this inspection report for this program element.

40 CFR § 68.83 – Employee Participation

The Facility maintains a policy for employee participation in all elements of the Facility's RMP and PSM programs.¹⁰⁹ This policy details employee responsibilities for the development and implementation of each program element. Interviews with personnel during the EPA inspection, including union representation, verified that operators are encouraged to participate in RMP elements relevant to their operating unit. Completed PHAs are available to all operations employees through the refinery intranet system. Operators are also able to directly request changes to operating procedures. All employees participate in periodic safety meetings, and operators are encouraged to identify and report any identified issues.

The EPA inspection team did not identify any potential AOCs in relation to this program element.

40 CFR § 68.85 – Hot Work Permits

The Facility has developed and implemented a hot work safety procedure for any work that involves welding, cutting, grinding, drilling, buffing, sand blasting, soldering, and creating or generating sparks in areas where flammable or combustible materials may be present.¹¹⁰ This procedure is applicable to all Facility employees, contractors, and visitors. The procedure delineates the different types of hot work permits, pre-requisites and procedures for conducting hot work, and duties of the fire watch, supervisor, operator, and shift superintendent. The procedure delineates the two (2) different types of hot work permits, high energy and low energy, and pre-requisites and procedures for conducting hot work. The hot work permit indicates the date the permit was issued. Permits are only valid for one shift. Permits are completed and handled as hard copies to be displayed at the jobsite and are kept on file for up to one year. As of March 11, 2024, there is a new RMP requirement that requires all hot work permits be retained and kept on file for up to three (3) years, effective May 10, 2024.

The EPA inspection team did not identify any potential AOCs in relation to this program element.

40 CFR § 68.87 – Contractors

The Facility maintains a Safety and Health Guideline with General Rules for Contract Work that provides guidelines, requirements, and safety qualifications for all new and existing contractors that perform work at the refinery.⁶⁵ Additionally, the guideline details the roles and responsibilities of the Valero project engineers/contractor sponsors, site procurement, site safety, and the business unit manager/authorized designee/leadership team in onboarding contractors and assuring safe contractor operations.⁶⁶ The Facility requires that contractors

¹⁰⁹ See RFI Response #16, VALERO-AR-EPA-RMP-001280 – VALERO-AR-EPA-RMP-001284

¹¹⁰ See RFI Response #17, VALERO-AR-EPA-RMP-001286 – VALERO-AR-EPA-RMP-001308

meet certain safety criteria, including an ISNetworld (ISN) dashboard grade of a B or better, Training Review and Verification Services (T-RAVS) submissions for onsite employees, and a comprehensive safety/health program with industrial hygiene components as needed. However, a contractor not meeting all the general criteria for qualification can work with a Variance, a Contractor Exemption/Variance Request Form, completed by the Valero sponsor and approved by the refinery vice president.⁶⁷

Additionally, each contract employee is required to have a certificate in Basic Operator Plus or Safety Essentials and complete the Valero-Ardmore Refinery Site Specific/HF Alky Orientation. The contractor guideline also provides PPE requirements, procedures for emergency/evacuations, requirements for confined space entry, and requirements for safe work permits, including hot work permits.⁶⁸ The Facility maintains a Short Service Worker Program, which contains information on the emergency alarm system, emergency reporting, and an emergency evacuation map with muster points.⁶⁹

All contractors are expected to participate in Valero's Contractor Safety Council monthly audits. These audits evaluate whether contractors have appropriate training and follow the Facility safety rules. Areas to audit are selected at the monthly Safety Council meeting.⁷⁰ The Facility also tracks several Key Performance Indicators (KPIs) related to contractor safety, including year-to-date reportable injuries, ISNet Company Grade, and monthly job audits completed.⁷¹

The EPA inspection team requested contractor paperwork for one of the Facility's largest embedded contractors, Turn2 Specialty Companies, LLC (Turn2). The Facility provided paperwork for calendar years 2021, 2022, and 2023. KPIs provided as of June 2024 indicate that Turn2 has an ISNet Company Grade of C/D/F. Additionally, the PSM Onsite Contractor Assessment Questionnaires for Turn2 conducted on February 2, 2023⁷² and February 21, 2024⁷³ indicate that Turn2 did not have an ISNet score of B or better during the 2023 and 2024 contractor assessment and was working under a variance. At the time of the inspection, the Facility did not provide a Contractor Exemption/Variance Request Form, nor did it provide documentation that the refinery vice president (or designee) had reviewed and approved an explanation of the contractors' unacceptable ISNet score. Further, the Facility did not provide documentation of a corrective action plan for Turn2, as required by the Facility's contractor Safety and Health Guideline.⁷⁴

Per the Facility's Safety and Health Guideline, contractor employees are required to have a certificate in Basic Operator Plus or Safety Essentials and complete the Valero-Ardmore Refinery Site Specific/HF Alky Orientation.⁷⁵ Turn2's training requirements also specify annual Basic Plus Safety Training.⁷⁶ The Facility only provided detailed training history for two Turn2 employees: [REDACTED], dated February 2024,⁷⁷ and [REDACTED], dated January 23, 2023.⁷⁸ In contrast, the January 2024 Toolbox Safety Meeting attendance sheet indicates that more than ten Turn2 contractors were onsite at this time. Mr. [REDACTED]'s training records indicate that he completed the required Safety Essentials training course in September 2023; however, these records do not indicate that he completed the Valero-Ardmore Refinery Site Specific/HF Alky Orientation program. Similarly, Mr. [REDACTED]'s training records indicate that he completed

his Basic Plus Refresher Training on January 23, 2023, but do not indicate that he completed the Valero-Ardmore Refinery Site Specific/HF Alky Orientation program.⁷⁹

The EPA inspection team identified potential **AOCs 19 and 20** at the end of this inspection report for this program element.

40 CFR § 68.95 – Emergency Response

The Facility is a responding facility and has the capability to address emergency situations including fires, chemical releases, and medical emergencies involving Facility employees and on-site contractors. The Facility maintains an Integrated Contingency Plan (ICP), which includes the Facility's Emergency Response Action Plan (ERAP). The ICP includes internal and external notification procedures in the event of an emergency.¹¹¹

The ICP does not provide any information specific to HF emergencies, including first aid and/or emergency medical treatment necessary for HF exposure, nor does it reference other emergency response procedures for HF emergencies. API RP 751 (2021), Section 4.1.4.2 states that the emergency response plan shall include, "the need for, and location of, emergency medical treatment for HF exposure, including the location of clinics and hospitals that are familiar with HF burn care." Section 5.9.1 states that, "procedures should outline an appropriate response when personnel are exposed to HF vapor or liquid including inhalation, eye exposure, ingestion, or skin exposure." Additionally, the ICP does not contain information on the "scope and frequency of emergency response drills for LPG, HF-containing LPG, or HF releases," as required in Section 4.1.4.2 of API RP 751 (2021).

The Facility's Emergency Response Team (ERT) is comprised of an emergency response superintendent and approximately 63 volunteers that are trained in firefighting, hazardous materials (HAZMAT), rope rescue, and medical emergency response. Emergency response equipment includes two fire trucks, two pickup trucks equipped with Quick Attack systems, several foam trailers, a HAZMAT trailer, and a medical aid trailer. This equipment is housed at the fire station near the western edge of the Facility and guard station. Fire monitors, SCBAs, and other emergency equipment are located throughout the Facility. The Facility also maintains HF response kits that include calcium gluconate in the HF Alky Unit change room, HF Alky Unit lab, shift superintendent's office, and at the local hospital.

The Facility maintains a standard for its Fire & Safety Inspection Testing and Maintenance Program, dated December 31, 2024. This standard includes safety showers, fire hoses, fire pumps, fire monitors, breathing air equipment, Level A suits for the HF Alky Unit, and the HF Alky Unit water curtain and fixed monitor deluge systems.¹¹² The Facility's ICP indicates that testing records are maintained onsite for a minimum of five (5) years. The EPA inspection team requested and reviewed records of water curtain, fire monitor, and rapid acid dump (RAD)

¹¹¹ VALERO-AR-EPA-RMP-001571 - VALERO-AR-EPA-RMP-001997

¹¹² VALERO-AR-EPA-RMP-002007 - VALERO-AR-EPA-RMP-002052

system testing in the HF Alky Unit for calendar year 2024.¹¹³ The inspection team also requested and review the last two years of fire hose inspection and replacement records.¹¹⁴

The Fire & Safety Inspection Testing and Maintenance Program indicates that the Facility's contractor, Total Safety, inspects the Self-Contained Breathing Apparatus (SCBAs) monthly basis and flow tests the SCBAs annually. During the walkthrough of the HF Alky Unit, the EPA inspection team observed two (2) SCBAs that were more than a month overdue for flow testing. One (1) of the overdue SCBAs was located in the operator shelter, while the other was located in the change room. The flow test sticker on both SCBAs indicated that the equipment was due for testing on December 4, 2024, after having been previously tested on December 11, 2023 (see photographs 2, 3, 6 and 8 of Attachment 4). The EPA inspection team also observed several safety showers in the HF Alky Unit that were overdue for testing (see photographs 10 and 14 of Attachment 4). The inspection sticker on the showers indicated that the showers were last inspected in October 2024. The Fire & Safety Inspection Testing and Maintenance Program indicates that Total Safety tests the safety showers monthly.¹¹⁵ However, ANSI Z358.1 (2014) Section 4.6.2 requires weekly inspection and testing of emergency showers.

The Facility has a mutual aid agreement with the City of Ardmore Fire Department. Additionally, the Facility does quarterly notification exercises, annual response team tabletop exercises, and annual equipment deployment exercises.¹¹⁶ The Ardmore Fire Department and nurses from two (2) local hospitals participated in onsite HF Acid emergency response training on October 2, 2024. The Ardmore Fire Department participated in a tabletop exercise on June 4, 2024.¹¹⁷

The EPA inspection team identified **AOCs 21 and 22** at the end of this inspection report for this program element.

40 CFR § 68.195 – Risk Management Plan

The Facility most recently submitted an RMP to EPA in April 2020 (resubmission), following its previous submission in May 2016 (resubmission). The resubmissions were all within the 5-year timeframe, with the upcoming resubmission and/or 5-year update is due in April 2025.

The EPA inspection team did not identify any potential AOCs in relation to this program element.

CLOSING CONFERENCE

Inspector Brook McKeown initiated the closing conference at 1:00 pm on Thursday, January 30, 2025. She reviewed three (3) initial AOCs identified during the inspection and stated that

¹¹³ VALERO-AR-EPA-RMP-008413 - VALERO-AR-EPA-RMP-008655

¹¹⁴ VALERO-AR-EPA-RMP-009711 - VALERO-AR-EPA-RMP-009725

¹¹⁵ VALERO-AR-EPA-RMP-002007

¹¹⁶ VALERO-AR-EPA-RMP-001571 - VALERO-AR-EPA-RMP-001997

¹¹⁷ VALERO-AR-EPA-RMP-002003, VALERO-AR-EPA-RMP-002004, VALERO-AR-EPA-RMP-002005

additional AOCs may be identified once EPA and ERG reviews the documentation provided by the Facility in detail.

Inspectors Elizabeth Pham and Brook McKeown discussed the estimating timing for delivery of the inspection report to the Facility and expected coordination between U.S. EPA Region 6 and the Facility. There were no questions from the Facility personnel, and the EPA inspection team adjourned the closing conference around 1:15 pm.

AREAS OF CONCERN (AOCs)

[AOC 1] Documentation, 40 CFR § 68.39(e) – *Data used to estimate population and environmental receptors potentially affected.*

The Facility did not provide accurate documentation of the data it used to estimate affected offsite population for its toxic WCS in its most recent RMP submission, dated April 15, 2020. Specifically, the Facility provided its Risk Management Plan Documentation, dated August 2021, which indicated that the Facility defined offsite populations using EPA's MARPLOT and 2010 Census data. This documentation, dated approximately sixteen months after the Facility's April 2020 RMP submission, lists the affected residential population for the toxic WCS as 43,354 people. Conversely, the April 2020 RMP submission lists the affected offsite residential population as 39,507 people for its toxic WCS. Valero updated its RMP OCS on April 7, 2025, and included a population total of 39,507.

[AOC 2] Process Safety Information (PSI), 40 CFR § 68.65(d)(1)(ii) – *(d) Information pertaining to the equipment in the process. (1) Information pertaining to the equipment in the process shall include: (ii) Piping and instrument diagrams (P&ID's).*

During the field verification of equipment noted on P&IDs, the EPA Inspection Team observed inaccuracies in the facility's PSI. Specifically, the acid storage drum (V-902) P&ID (drawing number D-90-0033, revision 26¹¹⁸) and the TK-104 butane sphere P&ID (drawing number D-100-0122, revision 16¹¹⁹) were inaccurate. Therefore, Valero failed to maintain accurate PSI for the documentation stated above.

[AOC 3] Process Safety Information (PSI), 40 CFR § 68.65(d)(2) – *(d) Information pertaining to the equipment in the process. (2) The owner or operator shall ensure and document that the process is designed and maintained in compliance with recognized and generally accepted good engineering practices.*

The EPA Inspection Team identified refinery process piping, particularly in the HF Alky unit (see photograph 18 of Attachment 4), that was not labeled or color coded to indicate contents, direction of flow, and/or potential hazard per ASME A13.1 (2023). As a result, this equipment does not comply with RAGAGEP.

¹¹⁸ VALERO-AR-EPA-RMP-002173

¹¹⁹ VALERO-AR-EPA-RMP-002186

[AOC 4] Process Safety Information (PSI), 40 CFR § 68.65(d)(2) – *(d) Information pertaining to the equipment in the process. (2) The owner or operator shall ensure and document that the process is designed and maintained in compliance with recognized and generally accepted good engineering practices.*

The Facility's most recent two API RP 751 audits of its HF Alky Unit were conducted in December 2019 and on January 21, 2023. API RP 751 (2021), Section 4.2.2 states that "each operating unit shall be audited at least every 3 years." As a result, the January 21, 2023 API RP 751 audit was approximately one month overdue per RAGAGEP.

[AOC 5] Process Hazard Analysis (PHA), 40 CFR § 68.67(f) – *At least every five (5) years after the completion of the initial process hazard analysis, the process hazard analysis shall be updated and revalidated by a team meeting the requirements in paragraph (d) of this section, to assure that the process hazard analysis is consistent with the current process. Updated and revalidated process hazard analyses completed to comply with 29 CFR 1910.119(e) are acceptable to meet the requirements of this paragraph.*

The Facility did not complete the LPG Storage West PHA within the required five-year interval, as the two most recent PHAs reports that the Facility provided for this unit were dated August 19, 2019 and March 14, 2025. As a result, the Facility did not complete the revalidation reports for the 2024 LPG Storage West PHA within the five-year interval as required under 40 CFR § 68.57(f).

[AOC 6] Process Hazard Analysis (PHA), 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; document what actions are to be taken; complete actions as soon as possible; develop a written schedule of when these actions are to be completed; communicate the actions to operating, maintenance and other employees whose work assignments are in the process and who may be affected by the recommendations or actions.*

One (1) of the in-process action items (AI 467801) from the 2023 HF Alky Unit PHA has not been completed by the due date of January 14, 2025, established in the Facility's recommendation tracking table. As a result, the Facility failed to ensure that PHA recommendations were resolved in a timely manner.

[AOC 7] Operating Procedures, 40 CFR § 68.69(a)(1)(iv) – *Steps for each operating phase: emergency shutdown including the conditions under which emergency shutdown is required, and the assignment of shutdown responsibility to qualified operators to ensure that emergency shutdown is executed in a safe and timely manner.*

Some of the Facility's emergency operating procedures do not state the specific steps required to activate key safety systems in the HF Alky Unit. Operating procedure ALKY-EP-0711, Alky Unit Fire, Leak, or Rupture, instructs the operator to activate safety systems such as the emergency

response system, the water curtain, and the RAD system.¹²⁰ However, the procedure does not provide details on how to activate these systems, nor does it refer to additional operating procedures that specify the steps required to activate these safety systems.

[AOC 8] Operating Procedures, 40 CFR § 68.69(a)(2) – Operating limits: Consequences of deviation; and steps required to correct or avoid deviation.

The Facility's emergency operating procedures do not directly provide safe operating limits for emergency situations. Specifically, operating procedures ALKY-EP-0706, Loss of Cooling Water, ALKY-EP-0731, HF Alkylation Unit Rapid Acid Dump Emergency Procedure, and ALKY-EP-07677, Propane Defluorinators/KOH Treater Temperature Excursion (Exotherm), fail to directly provide safe operating limits for the HF Alky Unit, such as the safe operating temperatures and pressures, during an incident.^{121,122,123} Valero maintains consequence of deviation information separately from operating procedures.

[AOC 9] Operating Procedures, 40 CFR § 68.69(a)(3)(ii – iii) – Safety and health considerations: Precautions necessary to prevent exposure, including engineering controls, administrative controls, and personal protective equipment; Control measures to be taken if physical contact or airborne exposure occurs;

Operating procedures ALKY-EP-0752, V-906 Condensate Drum Emergency Operating Procedure, and ALKY-EP-0760, Checking Alky Unit Cooling Water Exchangers for Hydrocarbon/HF Acid Leaks, include information about potential HF exposure but do not specifically identify the exact level of PPE required, medical treatment procedures, or the local clinic or hospital for treatment of HF acid exposure.^{124,125} Additionally, these procedures do not refer to the Facility's operating procedure ALKY-EP-0768, HF Acid Release and Response. The operating procedure ALKY-EP-0768, HF Acid Release and Response, does include information on the level of PPE required and the name of the local clinic and hospital. However, ALKY-EP-0768 does not specify the medical treatment required in the event of an HF acid exposure and does not state the contact information for Valero Medical or Mercy Memorial Hospital.¹²⁶

[AOC 10] Training, 40 CFR § 68.71(b) – Refresher training shall be provided at least every three years, and more often if necessary, to each employee involved in operating a process to assure that the employee understands and adheres to the current operating procedures of the process. The owner or operator, in consultation with the employees involved in operating the process, shall determine the appropriate frequency of refresher training.

¹²⁰ VALERO-AR-EPA-RMP-007892 - VALERO-AR-EPA-RMP-007893

¹²¹ VALERO-AR-EPA-RMP-007887 - VALERO-AR-EPA-RMP-007888

¹²² VALERO-AR-EPA-RMP-007914 - VALERO-AR-EPA-RMP-007932

¹²³ VALERO-AR-EPA-RMP-007966 - VALERO-AR-EPA-RMP-007968

¹²⁴ VALERO-AR-EPA-RMP-007935 - VALERO-AR-EPA-RMP-007936

¹²⁵ VALERO-AR-EPA-RMP-007944 - VALERO-AR-EPA-RMP-007946

¹²⁶ VALERO-AR-EPA-RMP-007972 - VALERO-AR-EPA-RMP-007984

The Facility requires operators to complete refresher training every three years. However, operator, [REDACTED], completed his initial training for Complex III – ALKY – Treaters Operator on May 4, 2018, but did not complete his three-year refresher training by May 3, 2021, as required.¹²⁷

[AOC 11] Mechanical Integrity (MI), 40 CFR § 68.73(b) – *Written Procedures. The owner or operator shall establish and implement written procedures to maintain the on-going integrity of process equipment.*

The Facility has not followed its written procedures for the inspection of HF Alky Unit piping for the Alky Flare Line #R2 off Tank, T-901. The Facility's procedures indicate that piping (trace HF service) should be subject to visual external inspections every five years and on-stream thickness measurements every five years.¹²⁸ EPA requested inspection and testing data for the Alky Flare Line dating back to 2005. Based on the provided documentation, the last external visual inspection of the Alky Flare Line was conducted more than 10 years ago in August 2014.¹²⁹ As a result, the Alky Flare Line is approximately five years overdue for external visual inspection. The last UT thickness measurements of the Alky Flare Line were conducted in March 2018, approximately seven years ago.¹³⁰ As a result the Alky Flare Line is approximately two years overdue for external thickness testing.

[AOC 12] Mechanical Integrity (MI), 40 CFR § 68.73(b) – *Written Procedures. The owner or operator shall establish and implement written procedures to maintain the on-going integrity of process equipment.*

The Facility has not followed its written procedures for the inspection and calibration of HF point detectors in the HF Alky Unit. The Facility's SAP Maintenance Plan for the ten HF point source detectors in the HF Alky Unit specifies a quarterly (12 week) maintenance cycle, which includes visual inspection and instrument calibration.¹³¹ Records for the first quarter of 2024 (January 23 and 25, 2024) indicate that the Facility did not perform the required PM the Facility was "ordering a new analyzer" in order to be able to conduct calibration on the newer model.¹³² The Facility provided calibration records for the second quarter of 2024 (July 17, 2024) for four (4) of ten (10) point source detectors in the HF Alky Unit (AI-906063, AI-906064, AI-906066, and AI-906067).¹³³ These records indicate that the Facility was once again unable to perform the required and was ordering a new analyzer that was capable of being calibrated. As a result, the Facility failed to implement its written producers for the calibration of its HF point detectors during the first and second quarters of 2024 because the prior sensors were not

¹²⁷ See RFI Response #2-27, VALERO-AR-EPA-RMP-009327

¹²⁸ VALERO-AR-EPA-RMP-009396

¹²⁹ VALERO-AR-EPA-RMP-009309 - VALERO-AR-EPA-RMP-009313

¹³⁰ VALERO-AR-EPA-RMP-009314

¹³¹ VALERO-AR-EPA-RMP-008859

¹³² VALERO-AR-EPA-RMP-008350 - VALERO-AR-EPA-RMP-008359

¹³³ VALERO-AR-EPA-RMP-008360 - VALERO-AR-EPA-RMP-008363

compatible with calibration testing, and the calibration was only carried out when the sensors were replaced with a technology capable of being calibrated.

[AOC 13] Mechanical Integrity (MI), 40 CFR § 68.73(d)(2) – Inspection and Testing. *Inspection and testing procedures shall follow recognized and generally accepted good engineering practices.*

The Facility failed to follow RAGAGEP in selecting CMLs for the HF regenerator vessel, T-903, given vessel service and history of accelerated corrosion, dating back to at least 2005. After the Facility patched and replaced a corroded section at the bottom of the vessel shell in 2005, it used UT testing to monitor wall thickness at four (4) CMLs in this section of the vessel shell. However, the four (4) CMLs were not sufficient to detect localized thinning. In November 2024, the Facility contracted an AUT examination of the bottom portion of the tank shell, following a RBI revalidation that split the tank into two (2) circuits and increased the number of required shell data points. The AUT inspection revealed significant wall loss in the bottom portion of the tank.

Several standards, including API RP 751 and API 510, provide guidance for on-stream thickness monitoring and CML selection in cases where localized corrosion may occur.

API RP 751 (2021), Section 6.4.3.2 states that, *“The number and location of thickness measurements shall, in part, be based on results of previous inspections and unit operating history.”* Additionally, *“Volumetric measurements of thickness monitoring [e.g., ultrasonic testing (UT) scanning and profile radiography] as described in API 510 and API 570 should be used for HF services, especially where the corrosion specialist determines that localized corrosion may occur. Spot UT measurements can miss highly localized corrosion.”*

API 510 (2014), 5.6.2.2 states that, *“Pressure vessels with high potential consequences if failure should occur, and those subject to higher corrosion rates, localized corrosion, and high rates of damage from other mechanisms, will normally have more CMLs and be monitored more frequently.”*

As a result, prior to the RBI revalidation in July 2024, the Facility failed to follow RAGAGEP in establishing an appropriate number of representative CMLs on the bottom portion of the vessel. Additionally, prior to November 2024, the Facility failed to use an appropriate thickness monitoring technique, such as AUT examination, to identify localized corrosion and wall loss, given the vessel service and history of accelerated corrosion.

[AOC 14] Mechanical Integrity (MI), 40 CFR § 68.73(d)(2) – Inspection and Testing. *Inspection and testing procedures shall follow recognized and generally accepted good engineering practices.*

The Facility’s inspection and testing procedures for the collection of vibration monitoring data for pumps in the HF Alky Unit do not follow RAGAGEP. Section 6.5.7 of API RP 751 (2021) states that, *“Pumps in rich HF, fresh HF, and phase change HF services shall have monitoring for early*

indication of bearings and seal failures. This monitoring should be performed remotely.” The Facility does not employ remote, continuous vibration monitoring for any of the pumps in the HF Alky Unit. Instead, vibration readings for the HF Alky Unit pumps are collected on a bi-weekly to monthly basis during unit rounds.

[AOC 15] Mechanical Integrity (MI), 40 CFR § 68.73(d)(4) – *The owner or operator shall document each inspection and test 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 Facility failed to consistently document the inspection and testing of its HF point and perimeter detectors in its HF Alky Unit. The EPA inspection team requested the last five (5) years of calibration and testing records for the HF point source detectors and HF perimeter detectors. Both the point and perimeter detectors are calibrated and inspected quarterly, per their respective SAP Maintenance Plans. The Facility provided calibration records for the point detectors for calendar year 2024, but not for 2020 through 2023. The Facility provided calibration and testing records for its perimeter detectors for 2023 and the third quarter of 2024. The Facility did not initially provide calibration records for the perimeter detectors for calendar years 2020 and 2021, nor did it provide calibration records for the first, second, and fourth quarters of 2024. The Facility indicated that it would provide additional calibration records, once identified.

As a result, the Facility has failed to document the inspection and testing of its HF point detectors for 2020 through 2023 and has failed to document the inspection and testing of its HF perimeter detectors for 2020 through 2021 and three (3) quarters of 2024.

[AOC 16] Mechanical Integrity (MI), 40 CFR § 68.73(e) – *Equipment deficiencies. The owner or operator shall correct deficiencies in equipment that are outside acceptable operating 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.*

The Facility failed to correct deficiencies noted during external visual inspections of its HF Regenerator Tank T-903 and the Alky Flare Line (#R2) off Tank T-901 in a safe and timely manner.

- A November 2012 external inspection of T-903 noted several deficiencies, including deterioration of the tank foundation grout, resulting in the exposure of reinforcing steel elements, and missing CML ports in the insulation jacketing.¹³⁴ The 2012 inspection report indicated that work orders were opened to correct these deficiencies; however, the November 2016 external visual inspection found that these work orders had not

¹³⁴ VALERO-AR-EPA-RMP-008928 - VALERO-AR-EPA-RMP-008935

been completed and noted the same deficiencies identified during the previous external inspection.¹³⁵

- A December 2009 external visual inspection of the Alky Flare Line (#R2) off T-901 noted several deficiencies (i.e., the dummy leg did not have a weep hole and 50% coating failure of the line) and made recommendations to correct these deficiencies.¹³⁶ However, the August 2014 external visual inspection found that the recommendations from the previous inspection had not been completed.¹³⁷

[AOC 17] Incident Investigation, 40 CFR § 68.81(c) – *An incident investigation team shall be established and consist of at least one person knowledgeable in the process involved, including a contractor employee if the incident involved work of the contractor, and other persons with appropriate knowledge and experience to thoroughly investigate and analyze the incident.*

The Facility's incident investigation guidelines do not clearly specify that the incident investigation team shall include a contractor employee, for incidents involving the work of that contractor. The Facility's guidelines in Appendix G of their Incident Investigation Guidelines require the inclusion of the involved contractor for near misses and Category I events, but do not include involved contractors for Category II, III, or IV incidents.¹³⁸

[AOC 18] Incident Investigation, 40 CFR § 68.81(d) – *A report shall be prepared at the conclusion of the investigation which includes at minimum: (2) Date investigation began.*

Incident investigation reports for several incidents reviewed by the EPA inspection team did not include the date the investigation began, including a November 10, 2020 incident involving an alky leak on E-032 (Incident ID 438378);¹³⁹ an April 22, 2022 incident involving a CFHT charge pump area fire (Incident ID 456664);¹⁴⁰ a May 19, 2023 release from the PSV on Tanks 1, 2, and 3 in the HF Alky Unit (Incident ID 471426);¹⁴¹ and a December 7, 2023 incident involving fluoride scale on pump P-903 in the HF Alky Unit, indicating a release from the pump (Incident ID 479100).¹⁴² However, the April 13, 2023 version of the Cause Map Template (Version 2.7) provided to the EPA inspection team included the investigation start date and time, and Facility personnel indicated that the template was recently updated to include this information.¹⁴³

¹³⁵ VALERO-AR-EPA-RMP-008937 - VALERO-AR-EPA-RMP-008940

¹³⁶ VALERO-AR-EPA-RMP-009303 - VALERO-AR-EPA-RMP-009304

¹³⁷ VALERO-AR-EPA-RMP-009309 - VALERO-AR-EPA-RMP-009313

¹³⁸ VALERO-AR-EPA-RMP-001258 - VALERO-AR-EPA-RMP-001259

¹³⁹ VALERO-AR-EPA-RMP-008334 - VALERO-AR-EPA-RMP-008335

¹⁴⁰ VALERO-AR-EPA-RMP-008336

¹⁴¹ VALERO-AR-EPA-RMP-008338

¹⁴² VALERO-AR-EPA-RMP-008340 - VALERO-AR-EPA-RMP-008341

¹⁴³ VALERO-AR-EPA-RMP-001265

[AOC 19] Contractors, 40 CFR § 68.87(b)(1) – *The owner or operator, when selecting a contractor, shall obtain and evaluate information regarding the contract owner or operator’s safety performance or programs.*

The Facility failed to evaluate contractor safety performance as required in its contractor Safety and Health Guideline. The Facility’s contractor Safety and Health Guideline requires contractors to maintain an ISNet grade of a B or better. However, contractors that do not meet all safety criteria can work with a Variance (Contractor Exemption/Variance Request Form) completed by the Valero sponsor and approved by the refinery vice president.⁸⁸ Documentation provided by the Facility indicates that one of the Facility’s largest embedded contractors, Turn2, has had an ISNet grade of C/D/F since at least February 2023. The Facility did not provide a Contractor Exemption/Variance Request Form or other documentation that the refinery Vice President (or designee) had reviewed and approved an explanation of Turn2’s unacceptable ISNet score. Additionally, the Facility did not provide documentation of a corrective action plan as required by the Facility’s contractor Safety and Health Guideline.

[AOC 20] Contractors, 40 CFR § 68.87(b)(2) – *The owner or operator shall inform the contract owner of the known potential fire, explosion, or toxic release hazards related to the contractor’s work and the process.*

The Facility’s Safety and Health Guideline requires contract employees to have a certificate in Basic Operator Plus or Safety Essentials and complete the Valero-Ardmore Refinery Site Specific/HF Alky Orientation program offered at SouthernTech.⁸⁹ Although Facility representatives indicated that Turn2 is one of the Facility’s largest embedded contractors, the Facility only provided documentation that two Turn2 employees had completed the Basic Plus/Safety Essentials Training in 2023-2024, and neither employee had completed the Site Specific/HF Alky Orientation Program. In contrast, other contractor records and the January 2024 Toolbox Safety Meeting attendance sheet indicate that more than ten contractors were onsite at that time. As a result, Valero failed to ensure that the contractor had completed training on the known hazards of the Facility and its HF Alky Unit.

[AOC 21] Emergency response program, 40 CFR § 68.95(a)(1) – *The emergency response plan, which shall be maintained at the stationary source and contain at least the following elements: {...} (ii) Documentation of proper first-aid and emergency medical treatment necessary to treat accidental human exposures; and (iii) Procedures and measures for emergency response after an accidental release of a regulated substance.*

The Facility’s emergency response plan (ICP) does not provide any information specific to HF emergencies, including first aid and/or emergency medical treatment necessary for HF exposure, nor does it contain information on the scope and frequency of emergency response drills for LPG, HF-containing LPG, or HF releases as required in API RP 751, sections 4.1.4.2 and 5.9.1.

[AOC 22] Emergency response coordination activities, 40 CFR § 68.95(a)(2) – *(a) The owner or operator shall develop and implement an emergency response program for the purpose of*

protecting public health and the environment. Such program shall include the following elements: (2) Procedures for the use of emergency response equipment and for its inspection, testing, and maintenance;

Section 3.2.6.7 of Valero's Fire & Safety Inspection Testing and Maintenance Program document, dated December 31, 2024, requires all SCBAs to be tested annually by a third-party contractor.¹⁴⁴ During the inspection walkthrough of the HF Alky Unit, a SCBA in the HF Alky operator shelter and a SCBA in the HF Alky change room were observed to be overdue for flow testing per the December 4, 2024 due dates listed on the equipment tags (see photographs 2, 3, 6 and 8 of Attachment 4). Therefore, the Facility failed to follow their procedures for the inspection, testing, and maintenance of emergency response equipment.

Additionally, three safety showers in the HF Alky unit were overdue for inspection. Inspection tags show that they were last inspected in October 2024 (see photographs 9, 10, 14, 19 and 20 of Attachment 4). Further, the inspection tags observed during the field inspection document inspections on a monthly basis. Valero's Fire & Safety Inspection Testing and Maintenance Program document, dated December 31, 2024, states that safety shower testing will be performed by the Facility's contractor, Total Safety, on a monthly basis.¹⁴⁵ Therefore, the Facility failed to follow their procedures for the inspection, testing, and maintenance of emergency response equipment. Additionally, the ANSI Z358.1 (2014) Section 4.6.2 requires weekly inspection and testing of emergency showers. As a result, the Facility's testing frequency for its safety showers do not follow RAGAGEP.

¹⁴⁴ VALERO-AR-EPA-RMP-002009

¹⁴⁵ VALERO-AR-EPA-RMP-002007

LIST OF ATTACHMENTS

Attachment 1: Notice of Inspection and Right to Claim Confidentiality

Attachment 2: Opening Meeting and Interview Sign-In Sheet

Attachment 3: Document Request List

Attachment 4: Photographs and Photograph Log