

Region 6 - Enforcement & Compliance Assurance Division

INSPECTION REPORT

Inspection Date(s):	April 24-April 28, 2023	
Media Program:	Air	
Regulatory Program(s)	Clean Air Act Section 112(r) and 40 C.F.R. Part 68 Chemical Accident Prevention Provisions - Risk Management Plan (RMP)	
Company Name:	Pasadena Refining System, Inc.	
Facility Name:	Pasadena Refinery	
Facility Physical Location:	111 Red Bluff Road	
(city, state, zip code)	Pasadena, Texas 77506	
Mailing address:	Same as above	
(city, state, zip code)		
County/Parish:	Harris County	
Facility Phone Number	713-472-4051	Community Concerns – Odors, Emissions, Operations
Facility Contact:	Matt Postage	Health, Safety and Environmental Manager
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FRS Number:	110000462703	
Identification/Permit Number:	TX0000004820100006	
Media Identifier Number:	RMP 100000038274	
NAICS:	324110 (Petroleum Refineries)	
SIC:	2911	
Personnel participating in inspection:		
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EPA Lead Inspector Signature/Date		
	Howard Cole	Date
Supervisor Signature/Date		
	Samuel Tates	Date

SECTION I – INTRODUCTION

PURPOSE OF THE INSPECTION

United States Environmental Protection Agency (EPA) Region 6 inspectors Howard Cole and Sam Tates arrived at the PASADENA REFINING SYSTEM INC. (Pasadena Refinery) facility at 9:00 AM on Monday, April 24, 2023, for an announced inspection. We met with Nathan Kangas (Senior Process Safety Engineer-PSM Manager), Celina O'Connor (Environmental Manager), and other Pasadena Refinery employees for an opening conference. I presented my credentials and informed Pasadena Refinery personnel that this was an EPA inspection to determine compliance with the federal Chemical Accident Prevention Program. The scope of the inspection was a partial compliance evaluation, which included an evaluation of the facility's compliance with the Clean Air Act (CAA) Section 112(r), the Chemical Accident Prevention Provisions in 40 C.F.R. Part 68, and the General Duty Clause. Pasadena Refinery's RMP is listed as a Program Level Three (3), Title V facility.

FACILITY DESCRIPTION

Pasadena Refinery Refining is a full conversion fuels refinery. The refinery has blending facilities for gasoline, caustic treating units, and various utility systems. The facility currently has the following operational units: Crude, Light Oils, Merox, Sodium Hydrosulfide (NaSH)-Caustic Scrubber, Benzene Stripper, Diesel Hydrotreater, Naphtha Hydrotreater, Depropanizer, Reformer, Sour Water, and the Reformate Splitter.

An Alkylation Unit operating in a distillation-only configuration without acid present for reactions was also in operation. The facility is capable of processing heavy, high-sulfur crude oil into light petroleum products, including conventional gasoline, diesel, propane, butane, and light naphthas. The regulated substances are contained within the covered process units and tank farm. The facility operates 24 hours a day, 7 days a week and employs approximately 348 full-time employees. This is a union facility, United States Steel Workers 106, which was represented by Tavares Pullard during the inspection.

SECTION II – OBSERVATIONS

This inspection focused on determining RMP compliance in four units at the Pasadena Refinery facility.

Crude Unit: The Crude Unit uses fractional distillation to split crude oil into several fractions with varying boiling point ranges. Any fraction of the crude oil is referred to as a hydrocarbon. The initial fractionation takes place in a distillation tower, referred to as the Atmospheric Tower. Lighter hydrocarbons with the lowest boiling point rise into the overhead section condensers. From there, liquids are routed to the Debutanizer and Dehexanizer for additional separation. Heavier hydrocarbons with a higher boiling point range, such as heavy naphtha, kerosene, and atmospheric gas oils, are separated at various stages lower within the tower. The hydrocarbon stream with highest boiling range is pumped out of the bottom for additional fractionation. Additional fractionation takes place in a distillation tower referred to as the Vacuum Tower. Heavier hydrocarbons with a higher boiling point range than the Atmospheric Tower, such as vacuum gas oils, are separated at various stages within the tower. The hydrocarbon stream with highest boiling range is pumped out of the bottom to storage.

Reformer #3 Unit: The Reformer #3 Unit includes hydro-processing, naphtha hydrotreating, reforming, and associated equipment. Naphtha from the Crude Unit and from storage is fed to the Naphtha Hydrotreater to remove contaminants such as sulfur, nitrogen, and metals via a catalytic reaction in the Hydrotreater Reactor. Treated, hydrogen-rich vapors are compressed and reused in the Reformer #3 Unit and Hydrotreater #2 Unit. Treated liquids are routed to a stripper for additional contaminant removal, such as ammonia, water, and light hydrocarbons. Stripper bottoms are fed to processing equipment and then to Reforming Reactors to convert naphtha and straight run gasoline to high-octane reformate. The Reforming Reactor effluent liquid is sent to a Debutanizer for additional separation. The overhead liquids from the Debutanizer are routed to the propane/butane treating process, and the Debutanizer bottoms are routed to the Reformate Splitter Unit.

Sour Water Unit: The Sour Water Unit includes a sour water accumulator with associated pumps, and filters. Sour water is routed from various sources in the refinery, including the Crude Unit, the fluidized catalytic conversion (FCC) Unit, the S Zorb Unit, the Reformer #3 Unit, and the Hydrotreater #2 Unit, to the sour water accumulator to remove light hydrocarbons, acid gases, ammonia vapors, and other contaminants from the water. Collected vapors are routed to a flare, light hydrocarbon liquids are routed to storage, and the residual water is routed to storage for reuse in the Crude Unit.

NaSH Unit: The NaSH Unit treats all refinery sour hydrocarbon gas streams in a two-stage system. A sodium hydroxide (NaOH) solution is mixed with sour hydrocarbon vapors in a packed bed reactor to generate a chemical reaction in which hydrogen sulfide (H_2S) is converted to sodium hydrosulfide (NaSH). Treated hydrocarbon vapors are routed to the refinery fuel gas system, and the resulting NaSH solution is routed to storage.

Subpart A – General

40 C.F.R. § 68.10 Applicability – Pasadena Refinery, located in Pasadena, Texas, is the operator of a stationary source that has more than threshold quantities of regulated flammable substances, including chlorine, hydrogen, methane, ethane, ethylene, propane, propylene, butane, butene, 2-butene-cis, 2-butene-trans, isobutane, 1,3 butadiene, pentane, pentene, isopentane, and flammable mixtures listed in 40 C.F.R. § 68.130. Therefore, Pasadena Refinery is subject to Part 68 Chemical Accident Prevention Provisions. Pasadena Refinery is classified under North American Industrial Classification System (NAICS) code 324110 (Petroleum Refineries). Pasadena Refinery's refinery operates a variety of processes to produce petroleum products (e.g., gasoline and fuel oil) from raw crude oil. In addition, the refinery uses chlorine for biological growth control in cooling towers. An Alkylation Unit was not in operation at the time of the inspection and this unit and its equipment will be re-purposed in the future. The facility is also subject to the Occupational Safety and Health Administration (OSHA) process safety management (PSM) standard, 29 C.F.R. § 1910.119. Chlorine is the only RMP regulated toxic substance that the facility handles at or above the threshold quantity.

40 C.F.R. § 68.10 Program Eligibility – Pasadena Refinery re-submitted an RMP registration (5-year update) under 40 C.F.R. § 68.190 on July 29, 2021. The next registration re-submittal is due on July 29, 2026, unless an update or correction is required by 40 C.F.R. § 68.190 or 40 C.F.R. § 68.195 prior to the five-year renewal date.

40 C.F.R. § 68.12 General requirements – The re-submitted RMP plan requires the facility to: develop

and implement a management system; conduct a hazard assessment; implement the prevention requirements of 40 C.F.R. § 68.65 - § 68.87; develop and implement an emergency response program; and include the data elements from 40 C.F.R. § 68.175 in their RMP.

40 C.F.R. § 68.15 Management – Pasadena Refinery has developed a management system to oversee the implementation of the risk management program elements and provided an organizational chart that documents responsibility for the RMP program elements.

Subpart B – Hazard Assessment

40 C.F.R. § 68.20 Applicability –The facility is required to prepare an off-site consequence analysis and complete the five-year accident history. The most recent accident meeting the conditions for reporting in the standard occurred in July 2016.

40 C.F.R. § 68.22 Off-Site Consequence Analysis (OCA) Parameters – Pasadena Refinery uses RMP*Comp™ as the technique for modeling the release scenarios. For analyses of the offsite consequences for toxics, Pasadena Refinery has used the toxic endpoints provided in Appendix A of Part 68. For analyses of the off-site consequences for flammables, Pasadena Refinery has used as the endpoint, an explosion where the distance to an overpressure of 1 pounds per square inch (psi) occurs. For both the worst-case and alternative case scenarios involving flammables, the facility used the appropriate wind speeds and stability classes, ambient temperatures and humidity values, values for height of the release, and surface roughness values for the release scenario analyses, as provided in the standard.

40 C.F.R. § 68.25 Worse-Case Toxics and Flammable Release Scenario Analysis – Pasadena Refinery analyzed one toxic worst-case release scenario for hydrogen fluoride, estimated to create the greatest distance to endpoint, resulting from an accidental release of a regulated toxic substance from a covered process under worst-case conditions. Pasadena Refinery provided the analysis of one flammable worst-case release scenario for butane, estimated to create the greatest distance to endpoint, resulting from an accidental release of a regulated flammable substance from a covered process under worst-case conditions.

40 C.F.R. § 68.28 Alternative Toxics Release Scenario Analysis – Pasadena Refinery identified and analyzed chlorine as its alternative toxic release scenario. Pasadena Refinery identified and analyzed isobutane as its alternative flammable release scenario. Pasadena Refinery represents that hydrogen fluoride and chlorine are the only RMP-regulated toxic chemicals on site.

40 C.F.R. § 68.30 Defining Offsite Impacts - Population – Pasadena Refinery used the MARPLOT mapping program to define the affected off-site population, based on a circle with the point of release at the center. The facility used the most recent U.S. Census data, estimated to two significant digits, as referenced in the OCA documentation.

40 C.F.R. § 68.33 Defining Off Site Impacts - Environment – Pasadena Refinery has identified environmental receptors in the OCA, as determined by the distance to endpoint using methods such as local U.S. Geological Survey (U.S.G.S.) maps or any other data source containing U.S.G.S. data to identify environmental receptors.

40 C.F.R. § 68.36 Review and Update - If changes in processes, quantities stored or handled, or any other aspect of the stationary source might reasonably be expected to increase or decrease the distance to the endpoint by a factor of two or more, Section 68.36(b) requires the owner or operator to complete a revised analysis within six months of the change and submit a revised risk management plan as provided in § 68.190. In this regard, Pasadena Refinery shut down their Alkylation Unit prior to 2023. The unit employed hydrogen fluoride, and Pasadena Refinery plans to return the unit to operation in the future. Hydrogen fluoride is an RMP-regulated chemical and was previously used by Pasadena Refinery as the chemical evaluated in their off-site consequence analysis worst-case scenario.

40 C.F.R § 68.190 Updates: Section 68.190(b)(6) requires the owner or operator of a stationary source to revise and update the RMP submitted under § 68.150 within six months of a change that requires a revised off-site consequence analysis, as provided in §68.36. Pasadena Refinery failed to revise and update their RMP when they discontinued operation of the Alkylation Unit and the use of hydrogen fluoride prior to 2023, as this chemical was used for the worst-case off-site consequence analysis. As of August 11, 2023, no revised RMP had been submitted with an updated worst-case toxics release scenario. **[AOC-17 68.190(b)(6)]**

40 C.F.R. § 68.39 Documentation – For the worst-case and alternative release scenarios, a description of the vessel or pipeline and substance selected, assumptions and parameters used, the rationale for selection, the anticipated effect of the administrative controls and passive mitigation on the release quantity, and the release rate was performed and provided for EPA’s review.

40 C.F.R. § 68.42 Five-year accident history – Pasadena Refinery did not have any reportable accidents listed in their five-year accident history in their July 29, 2021, RMP registration. The most recent previous reportable accident occurred in July 2016.

Subpart D – Program 3 Prevention Program

40 C.F.R. §68.65 Process Safety Information (PSI) – Pasadena Refinery compiled written process safety information, which includes information pertaining to the hazards of the regulated substances used or produced by the process, information pertaining to the technology of the process, and information pertaining to the equipment in the process.

The Pasadena Refinery RMP program manual addressed process safety information as follows. The available Process Safety Information provides specific information to the refinery work force to enable them to make appropriate operational, technical, and maintenance decisions. It provides the basis for identifying and understanding the hazards of a covered process and is necessary in developing and supporting several provisions of this program, such as Process Hazard Analysis, Management of Change, and Incident Investigation. The written Process Safety Information ensures all personnel involved in operating and managing a covered process identify and understand the hazards posed by those processes involving highly hazardous chemicals.

I reviewed the Safety Data Sheets for RMP regulated process chemicals which contain the following data for the hazards of each substance: toxicity information, permissible exposure limits, physical data, reactivity data, corrosivity data, thermal and chemical stability data, and the hazardous effects of inadvertent mixing of materials that could foreseeably occur. I reviewed documentation concerning the

technology of the covered processes, which included block flow diagrams, process chemistry, maximum intended inventory, safe upper and lower limits for such items as temperatures, pressures, flows, or compositions and an evaluation of the consequences of deviation. I reviewed documentation pertaining to the equipment of each covered process, including, pressure vessels, piping, piping and instrumentation diagrams (P&IDs), electrical classification, pressure safety valves (PSV), relief system design, design basis, design codes and standards employed, and other safety systems.

The 2021 compliance audit identified seven (7) PSVs that did not have accurate design calculations. EPA reviewed a 2008 pressure relief study conducted by Invensys, which was provided to EPA by Pasadena Refinery. The study identified numerous scenarios which would potentially not allow pressure relief valves (PRVs) and the pressure relief system to correctly operate as designed. This was the only PRV study provided by Pasadena Refinery during the inspection. The executive summary of the study conducted by Invensys identified the following deficiencies in the pressure relief system:

“The East Flare system has eight units, and the West Flare system has eight units, with a total of 214 relief valves. The key findings from this study included undersized relief valves, relief valves with high back pressures, lateral sub-header replacements to prevent high back pressures on relief valves, and relief valves with undersized outlet piping. The Invensys 2008 study at the time of completion was the most comprehensive and accurate of all the studies Pasadena Refinery had completed to that point. The previous studies had assumed battery limit pressure and ignored the inlet and outlet piping pressure drop calculations. The previous studies also did not report any critical flow in the PRV outlet piping and headers which can cause significantly higher back pressures on the relief valves.”

Pasadena Refinery did not provide additional information to indicate that the findings identified in the 2008 study have been corrected, nor any information from its most recent relief study, currently in progress, to document, current status, calculation accuracy, and functioning of pressure relief valves, and the pressure relief system design.

I interviewed a Pasadena Refinery process engineer who is most familiar with the status of the facility's relief system. The engineer indicated that discussions with company management regarding addressing the relief system study findings began in the summer of 2022, and that a capital budget request for funding of this project to address the Reformer Unit relief system was submitted in early April 2023, but had not yet been approved. The engineer indicated that there were approximately 700-800 pressure relief valves at the facility, and that at least 50 percent (%) have had an engineering evaluation performed. However, no field modifications have been completed so far. I asked the Pasadena Refinery staff for supporting information regarding progress made so far on the actions to address the relief valve and relief system deficiencies, but no documentation with this data has been provided. The process engineer indicated that Pasadena Refinery's corporate staff have since taken the lead for the relief valve and system project, and they were in the process of reviewing information to develop their own study, conclusions, and action items.

The 2020 Crude Sour Water process hazard analysis (PHA) Finding 1 and the 2020 Reformer #3 PHA findings 15, 17, and 20 also identified areas of concern regarding failure to document pressure relief accurate design and design basis. **[AOC-1 68.65(d)(1)(iv)]**

40 C.F.R. §68.65(d)(1)(v) PSI – Ventilation system design.

Pasadena Refinery identified a finding in the December 2021 compliance audit which indicated there was no documentation of ventilation system design or maintenance information available for three shelter-in-place buildings finding 3.2.8: the Administration Building #1, the Operations Building #18, and the Refinery Lab Building #19. Pasadena Refinery also did not document that building pressurization systems were adequately maintained, as evidenced by active pressure alarms on six of eight buildings located in Class 1 Division 2 areas¹. The 2020 Sour Water PHA Facility Siting Checklist indicates that there is a need for enhanced heating, ventilation and air conditioning (HVAC) design for occupied buildings, and the 2020 Reformer #3 PHA contains a finding recommending a condition evaluation of the Refinery Control Center (RCC) existing pressurization system to determine if modifications are required. **[AOC-2 68.65(d)(1)(v)]**

40 C.F.R. §68.67 Process Hazard Analysis (PHA) – Pasadena Refinery performed initial PHAs that identified, evaluated, and controlled the hazards involved in the processes. The facility completes revalidation of each PHA based on the five-year cycle from the previous PHA, as they are divided among the covered process units. All PHAs reviewed were completed within the five-year cycle. The PHAs performed use the Hazard and Operability Study (HAZOP) methodology to identify hazards.

40 C.F.R. §68.67 (c)(5) Stationary Source Siting

In December 2012, Pasadena Refinery contracted Aon Energy Risk Engineering (AERE), a subsidiary of Aon Fire Protection Engineering (AFPE), to perform a five-year update to the stationary source siting study at the Pasadena, Texas Plant that was originally performed in August 2006. This updated study was a joint effort between AERE and Pasadena Refinery. Some hazardous materials at the refinery are vapors at room temperature, while many others are present at temperatures above their boiling points in the covered processes. Many of the materials handled at the facility are toxic and/or flammable. Occupants of buildings at the Pasadena plant can potentially be exposed to three types of process hazards: Vapor Cloud Explosions (VCE) resulting from release and ignition of flammable materials; fires resulting from the release and ignition of flammable materials; and intrusion of toxic vapor into the buildings.

The December 2012 AERE study included the following statement:

“Note: Per client request, permanent and portable occupied buildings located outside the security fence were not considered in this facility siting evaluation. See Figure 6 marked area with red dotted line for buildings present that are not considered. Per client, these buildings will be studied in phase 2 of this project.”

Pasadena Refinery has not provided EPA a copy of the referenced Phase 2 study which includes permanent and portable occupied buildings located outside the security fence; therefore, completion of the Phase 2 study cannot be confirmed. Pasadena Refinery, therefore, has failed to evaluate and control the hazards of explosion, fire, and toxic vapors to permanent and portable occupied buildings located

¹ Per 29 CFR 1910.307. See <https://www.osha.gov/laws-regs/regulations/standardnumber/1910/1910.307> for applicable requirements, and 1910.399 <https://www.osha.gov/laws-regs/regulations/standardnumber/1910/1910.399> for Class and Division definitions.

outside of the security fence, including office trailers and office buildings. The AERE stationary source siting study further indicated that extensive toxic vapor dispersion modeling studies were not part of the screening evaluation. Alternatively, as allowed by American Petroleum Institute (API) Standard 752, the facility can assume that all permanently occupied buildings at Pasadena Refinery have the potential for a hazardous toxic vapor concentration of at least Emergency Response Planning Guideline (ERPG)²-Level 3 in the event of an accidental release. Pasadena Refinery did not include a toxics hazard evaluation as part of a PHA siting study from May 2019 to the time of EPA's inspection in April 2023. Pasadena Refinery has not provided any information documenting that the resolutions of findings have been completed in response to the AERE siting study, or that another updated facility siting study has been completed which reflects changes that have occurred at the facility since 2012 involving operations, processes, equipment, or chemical inventory. **[AOC-3 68.67(c)(5)]**

40 C.F.R. §68.67(e) Recommendations are resolved in a timely manner. The 2021 compliance audit identified 85 of 115 PHA recommendations that were still open, with several dating back to 2010. The findings and recommendations from the following PHAs were reviewed during this RMP inspection:

- Crude Unit - October 2020 and August 2015
- NaSH Unit (Sulfur Recovery Unit - SRU) - August 2019 and September 2014
- Reformer #3 and Reformate Splitter - September 2020 and July 2015
- Sour Water System - October 2020

The EPA further reviewed PHA findings and recommendations that have remained open since 2015 and 2020. For these open findings, there was no indication of the corrective actions to be taken, and no written schedule was developed of when corrective actions would be completed. These open findings included the numerous stationary source siting findings which had not been addressed. The open recommendations that have been tracked since 2015 indicate that Pasadena Refinery has failed to establish a system to promptly address the PHA team's findings and recommendations, to assure that the recommendations are resolved in a timely manner, and to complete corrective actions as soon as possible. **[AOC-4 68.67(e)]**

40 C.F.R. § 68.69 Operating Procedures—Pasadena Refinery has developed and implemented written operating procedures that provide clear instructions for safely conducting most activities involved in each covered process, consistent with the process safety information, and which address the required elements. The procedures consisted of steps for each operating phase: initial startup; normal operations; temporary operations; normal shut down; emergency shutdown; emergency operations; and, start-up following a turnaround. Pasadena Refinery did not have hard copies of emergency shut down or emergency operating procedures in the control room to refer to in the event of a power failure. **[AOC-5 68.69(b)]**

Pasadena Refinery failed to ensure that Finding 3 of the 2018 compliance audit, indicating that operating procedures were not being reviewed annually, had been corrected. The failure to annually

² ERPGs are exposure guidelines developed by the Emergency Response Planning committee of the American Industrial Hygiene Association and are designed to anticipate health effects from exposure to certain airborne chemical concentrations. See <https://response.restoration.noaa.gov/oil-and-chemical-spills/chemical-spills/resources/emergency-response-planning-guidelines-erpgs.html>.

certify operating procedures was also identified as a finding in the 2021 compliance audit. Failure to annually review operating procedures continues to be an Area of Concern for this inspection. In accordance with requirements of §68.69, operating procedures must be certified annually. EPA requested the annual operating procedure certifications for the Crude Unit, Sour Water Stripper Unit, Reformer #3, and the NaSH Unit for calendar years 2020-2023. Pasadena Refinery staff indicated during the inspection that one third of the operating procedures were being reviewed over a three-year interval cycle. This does not meet the requirements of the standard, which specifies that operating procedure review and certification must be performed annually. The intent of the requirement is to assure that procedures reflect current operating practices, including any changes to the covered process. This is extremely important for the safe operation of covered processes to ensure that outdated or inaccurate operating procedures are corrected or removed. A three-year interval for review and certification would potentially allow incorrect and inaccurate operating procedures to exist for two-years or more.

During the inspection, Pasadena Refinery provided documents to me representing the annual certification for the operating procedures for the Zone 3 Units. The documents include a certification page and a spreadsheet denoting the specific operating procedures which are included in the annual certification. When viewing the spreadsheet in Excel, all the certified operating procedures (except for four procedures stating “read and acknowledge”) had a status column indicating if the review had been completed. However, some of the operating procedures displayed indicated that the review and certification of the operating procedures had not been completed. I verbally requested the spreadsheet listing all the operating procedures which had not been completed at the time of the inspection; but this document has not been provided. Pasadena Refinery represented to EPA that the signed annual certification statement provided indicated that all operating procedures listed had been reviewed, when, in fact, all the reviews of the operating procedures in the Zone 3 Units had not been completed. **[AOC-6 68.69(c)]**

40 C.F.R. §68.71 Training – Pasadena Refinery provided information regarding their operator training program. The site uses a variety of training methods, which include instructor-led classroom sessions, on-the-job training with experienced personnel, and job specific trainings (JSTs). The facility provides new operators initial training, which includes an overview of the process and the operating procedures, as specified in § 68.69. The training includes specific safety and health hazards, emergency operations including shut down, and safe work practices applicable to the employee's job tasks. Refresher training is required at least every three years for each employee involved in operating a process to assure that the employee understands and adheres to the current operating procedures.

EPA requested training records for six operators in the Crude Unit and Hydrotreater Unit. Pasadena Refinery did not ensure that one operator completed initial qualification training for the Hydrotreater Unit. **[AOC-7 §68.71(a)(1)]** Pasadena Refinery did not ensure that one operator completed refresher qualification training for the Crude Unit (or any other unit) between 2017-2022. **[AOC-8 §68.71(b)]**

40 C.F.R. §68.73(b) Mechanical Integrity

During this inspection, EPA requested for review the inspection and test records (internal and external inspection, and test plans), and ultrasonic testing (non-destructive examination) for fourteen pressure vessels (heat exchangers, towers, reactors, knockout-drum, etc.) and nineteen piping circuits in the

Crude, NaSH, Sour Water, and Reformer #3 Units. EPA also requested a list of current active instream pipe and pressure vessel leak repair devices (clamp, engineered clamp, wrap, or other) in place at the facility, and a list of leak repair devices that were removed in 2021, 2022, and 2023.

Pasadena Refinery failed to implement its mechanical integrity program by not ensuring that isometric drawings accurately reflect the ultrasonic non-destructive examination (NDE) testing performed for process piping. Pasadena Refinery also failed to ensure that ultrasonic NDE was performed on Reactors 100 and 101, in accordance with the Pasadena Refinery mechanical integrity program. Pasadena Refinery failed to develop and implement written procedures requiring ultrasonic testing and external inspections for the chemical injection 1.5-inch piping line segment P-2069 A2A2. Additionally, Pasadena Refinery failed to provide ultrasonic testing at condition monitoring locations on pressure vessels at intervals meeting the requirements of recognized and generally accepted good engineering practices, such as API 510, and failed to adhere to their mechanical integrity program's calculated next inspection due dates.

The 2021 compliance audit included a finding that the Mechanical Integrity program did not include all control systems and devices that prevent or mitigate process safety incidents. These trip switches, interlocks, alarms, indicators, and other control devices should be periodically tested in accordance with the manufacturer's recommendations, or in a way that provides assurance that the system or device will function as intended when activated. Examples of control systems and devices that did not have documented maintenance activities included the following equipment items:

- LAL 6401
- TAHH-131
- MD P1/1B check valve
- AI 38043 area ¾LEL
- FSL-0404
- Deluge system in the P-2NB area

The Reformer #3 2020 PHA has a finding (Item 5) requiring the facility to develop a program which documents inspection and testing for control system devices and interlocks responsible for system executive actions, based on measured process conditions in the Reformer #3 Unit. This is a unit-wide finding that includes compressors, heaters, and the regeneration tower. This finding was also identified in the 2010 PHA as Recommendation #13 and in the 2015 PHA as Recommendation #12. **[AOC-9 68.73(b)]**

68.73(d)(1) Inspections and tests shall be performed on process equipment-Pasadena Refinery failed to develop or implement a written inspection and testing program to document that building pressurized ventilation systems were operating in accordance with intended design and function for three shelter-in-place buildings: Administration Building (#1), Operations Building (#18), and the Refinery Lab (#19). Pasadena Refinery also failed to develop or implement an inspection and testing program to document that the building pressurization ventilation systems were operating in accordance with its intended design and function for the following other buildings, located in Class 1 Division 2 areas **[AOC-10 68.73(d)(1)]**:

- 73 Boiler House #3 Lab
- 76 Boiler House #3 Control Room
- 82 FCC Unit MCC

- 93 Complex 2400V substation
- 88A Complex UPS room
- 88B Complex battery room

68.73(d)(2) - Inspection and testing procedures shall follow recognized and generally accepted good engineering practices - Pasadena Refinery failed to perform ultrasonic inspection and testing every five years for Class 1 piping, at the condition monitoring locations (CMLs) on piping circuits, in accordance with API Standards 570 and 574, including but not limited to, Sections 6.3.3 and 6.5, respectively. Pasadena Refinery failed to conduct an external inspection on a 16-inch piping circuit F-303-15A (the D-2 flare piping), in accordance with API 570, Section 6.33, Table 1, which requires that an external inspection be performed at five-year intervals. An external inspection was performed on piping circuit F-303-15A on December 1, 2016, and the next inspection was due by December 1, 2021. At the time of the EPA inspection, no external inspection had been performed. Pasadena Refinery also failed to perform ultrasonic NDE testing for small bore piping segments, such as but not limited to, a two-inch piping circuit P-8210-1CB4S01, in accordance with API 570, Section 5.7. Pasadena Refinery failed to perform external inspections and ultrasonic NDE for piping circuits which are overdue, in accordance with API 570³, Section 6.33, Table 1. As of April 24, 2023, some inspections and NDE were not performed in the Sour Water Unit, Crude Unit 50, "SZORB" Unit 37, LPG Unit 32, Sulfur Plant Unit 35, Reformer #3 Unit 63, Light Oil Treating Unit 30. Pasadena Refinery also failed to conduct external inspections of pressure vessels every five years in accordance with API 510⁴, Section 6.4.1. As of April 24, 2023, Pasadena Refinery failed to perform ultrasonic NDE for piping segments, piping circuits, pressure vessels, and over 1000 other equipment components which are overdue for inspection and testing. Numerous piping segments and piping circuits have most recently documented thickness measurements that are below the nominal thickness for operation of the pipe, and at least 80 segments or circuits are below their calculated retirement thicknesses as of April 24, 2023. **[AOC-11 §68.73(d)(2)]**

§68.73(e) Equipment Deficiencies-Pasadena Refinery failed to ensure that equipment inspections were conducted, and equipment deficiencies were corrected, before further use or in a safe and timely manner. The 2021 compliance audit identified at least 683 incomplete fixed equipment inspection recommendations which had not been completed. Pasadena Refinery also failed to correct the deficiencies in the pressure relief valves and pressure relief system between May 2019 and May 2023 that were outside acceptable limits, as defined by the April 2008 Invensys Relief Systems Documentation Study. Pasadena Refinery did not provide any documentation that field modifications of these deficiencies had been completed, or management of change documentation finalized, which addressed the changes.

Pasadena Refinery failed to document that atmospheric pressure relief valves in the Crude Unit, PSVs 1322 and 1332, relieve to a safe location in accordance with recognized and generally accepted good

³ API 570 Section 1.1.1 states that-abandoned in place piping may still need inspection and/or risk mitigation to assure that it does not become a process safety hazard because of continuing deterioration.

⁴ API 510 (Definitions) indicates that-*in-service*-designates a pressure vessel that has been placed in operation as opposed to new construction prior to being placed in service or retired vessels. A pressure vessel not in operation because of a process outage is still considered an in-service pressure vessel. It also includes pressure vessels that are temporarily out of service but still in place at an operating site. *In-service inspection* means all inspection activities associated with a pressure vessel once it has been placed in service, but before it is permanently retired from service.

engineering practices such as, but not limited to, API 521 Section 5.8, and the Center for Chemical Process Safety (CCPS) Guidelines for Pressure Relief and Effluent Handling Systems⁵. Pasadena Refinery failed to document that there were accurate design calculations for atmospheric pressure safety valves (PSVs) 50-PSV-1302 (Crude Unit) and 62-PSV-3303 (Hydrotreater Unit 62), and that these PSVs relieve to a safe location in accordance with recognized and generally accepted good engineering practices such as, but not limited to, API 521 Section 5.8 and the CCPS Guidelines for Pressure Relief and Effluent Handling Systems. **[AOC-12 68.73(e)]**.

40 C.F.R. §68.75 Management of Change (MOC)— Pasadena Refinery provided management of change documents which EPA reviewed. The facility provided the Management of Change and Pre-Start-Up Safety Review Procedure with supporting appendices. Pasadena Refinery also provided procedures for how the facility manages changes (except for “replacements in kind”) to process chemicals, technology, equipment, and procedures, and changes to stationary sources that affect a covered process.

EPA also reviewed the 2021 compliance audit which identified findings indicating that the MOC procedures were not being managed in accordance with Pasadena Refinery policy or the RMP standard. The MOC PSSR procedure contains a requirement to update operating procedures also. The Pasadena Refinery 2021 compliance identified as an audit finding that 88 temporary MOCs and 8 emergency MOCs reviewed, dated from 2016-2021, were overdue based on the target completion dates. The MOC PSSR procedure contains requirements for completing temporary and emergency MOCs by their target date. The Pasadena Refining compliance audit also found that temporary and emergency MOCs were not consistently revised to reflect a new target completion date, or to indicate that the equipment was either returned to its original service or the MOC changed to permanent. **[AOC-13 68.75(b)(4)]**

The Pasadena Refinery 2021 compliance audit also identified as an audit finding that operating procedures were not updated when required due to a management of change. The Pasadena Refinery MOC-PSSR procedure refers to a requirement to update operating procedures in conjunction with MOCs and PSSRs. The audit finding indicated that 10 MOCs dated from 2016-2021 needed operating procedures to be updated, yet no modifications to the operating procedures were actually completed. **[AOC-14 68.75(e)]**

During the inspection, EPA determined that (The 2021 audit also found that) MOCs were not created for equipment abandonment and/or decommissioning, or for a change in operating service. The RMP rule requires development and implementation of a management of change process to address equipment changes.

40 C.F.R. §68.77 Pre-startup Safety Review (PSSR) – Pasadena Refinery provided the PSSR form used by the facility and the PSSR procedure for review. The facility provided pre-startup safety review records which were also reviewed. The Pasadena Refinery 2021 compliance audit identified as an audit finding that PSSRs were not being completed when the facility significantly modified an existing source affecting a covered process. The Pasadena Refining compliance audit indicated that the Pasadena Refinery MOC PSSR procedure states that all MOCs require “some form of PSSR evaluation.” The Pasadena Refining compliance audit team found that none of the 52 MOCs reviewed during the audit were identified with

⁵ See <https://www.aiche.org/resources/publications/books/guidelines-pressure-relief-and-effluent-handling-systems>.

MOCs. Fourteen (14) of the 52 MOCs reviewed were marked as "PSSR required" but no PSSR was attached, and the documents were not found following staff interviews. Eight of the 52 PSSRs that did contain MOCs either did not identify the MOC number, did not address the change identified in the MOC, or were not fully completed. [AOC-15 68.77(a)]

68.79 Compliance Audits – Pasadena Refinery certified that they evaluated compliance with the provisions of this subpart at least every three years to verify that procedures and practices developed under this subpart are adequate and are being followed. The compliance audits were conducted by at least one person knowledgeable in the process. EPA reviewed the two most recent reports for the audits conducted in December 2018 and in December 2021.

The 2021 compliance audit indicates that only 1 of 4 findings in the 2018 compliance audit, and several from 2015, had been closed, and that three 2018 findings remained open. Pasadena Refinery failed to complete the following corrective actions for two of the past 2015 findings identified in the 2018 audit, which then again identified as repeat findings in the 2021 compliance audit:

- Pasadena Refinery did not annually certify operating procedures were current and accurate, and,
- PHA recommendations were not addressed in a timely manner.

The 2021 compliance audit found that PHA recommendations were not promptly addressed with adequately documented action plans based on target due dates. In addition, corrective action plans did not document how the status of the recommended actions was communicated to operations and maintenance personnel, or other employees whose work assignments were in the process and who may have been affected by the actions. Pasadena Refinery failed to promptly determine and document an appropriate response to each of the open findings of the previous 2015-2018 compliance audits, and document that deficiencies have been corrected. [AOC- 16 68.79(d)]

40 C.F.R. § 68.81 Incident Investigation – Pasadena Refinery provided an incident investigation spreadsheet. The facility has investigated incidents which resulted in, or could reasonably have resulted in, a catastrophic release. EPA reviewed several incident reports and each of these incidents had investigations initiated no later than 48 hours following the incident. For each investigation reviewed, the investigation team consisted of at least one person knowledgeable in the process involved, including a contract employee if the incident involved work of the contractor, and other persons with appropriate knowledge and experience, who thoroughly investigated and analyzed each incident.

40 C.F.R. § 68.83 Employee Participation – Pasadena Refinery has developed a written plan of action regarding the implementation of the employee participation required by this section. All refinery employees are encouraged to participate in a broad spectrum of activities associated with the PSM and RMP programs, including involvement in the design, implementation, and ongoing management of the programs. The objective of Employee Participation within the refinery organization is to consult with employees and their representatives, where applicable, on the development of the various elements contained within 29 CFR 1910.119 and 40 CFR Part 68, and to provide employees and their representatives, where applicable, access to the information developed under the programs. Pasadena Refinery ensures that employees have appropriate involvement in helping to ensure that management understands and addresses the safety concerns of employees.

40 C.F.R. § 68.85 Hot Work Permit – Pasadena Refinery has an internal procedure that requires the

facility to issue general work permits for hot work operations conducted on or near a covered process. Hot work permits were reviewed, and no deficiencies were identified.

40 C.F.R. § 68.87 Contractors – Pasadena Refinery provided a Contractor Host and Contractor Safety procedure and uses *ISNET World* to select and evaluate contractors. Contractors on site include Brand (scaffolding), ICS (electrical), and Ohmstede (mechanical). Contractor procedures were discussed with Pasadena Refinery facility staff, and no deficiencies were identified.

Subpart E – Emergency Response

40 C.F.R. § 68.90 Applicability – Pasadena Refinery is designated as a responding stationary source and is subject to the requirements of 68.93 to 68.95.

40 C.F.R. § 68.93 Emergency Response Coordination Activities – Pasadena Refinery has coordinated response needs with the local emergency planning commissions (LEPCs) and other response organizations, such as the Channel Industries Mutual Aid (CIMA) to determine how the covered processes at the facility are addressed in the community's emergency response plan.

40 C.F.R. § 68.95 Emergency Response Program – Pasadena Refinery provided the Emergency Action Plan which was reviewed by EPA. For operators joining the emergency response team, the training includes hazardous waste operations (HAZWOPER), equipment, and emergency response. Rescue and emergency medical services training is separate for selected employees. There are 52 employees trained to the HAZWOPER Technician Level, including up to 46 operators. The Medical Department staff are on site from 7:30 am - 3:30 pm daily, and a physician's assistant is available 2-3 days per week. Response equipment includes a fire truck with 3 pumping apparatus, 2 Rescue Trucks, and 2 Quick Attack Trucks for water deluge. Vallen Inc. performs inspections of fire monitors and the deluge system.

40 C.F.R. § 68.96 Emergency Response Exercises – Pasadena Refinery conducts emergency response drills in coordination with the local emergency planning and CIMA.

Subpart G – Risk Management Plan

40 C.F.R. § 68.190 Updates - Pasadena Refinery re-submitted an RMP registration (5-year update) under 40 C.F.R. § 68.190 on July 29, 2021. The next registration re-submittal is due on July 29, 2026.

40 C.F.R. § 68.195 Required corrections –Pasadena Refinery's next registration re-submittal is due on July 29, 2026, unless an update or correction is required by 40 C.F.R. § 68.190 or 40 C.F.R. § 68.195 prior to the five-year renewal date.

Section III – AREAS OF CONCERN (AOC)

On the last day of the inspection, April 28, 2023, I conducted a closing conference, during which I presented several of the Areas of Concern identified during the inspection. I also mentioned there were some Areas of Concern associated with previous compliance audit findings. I indicated that additional Areas of Concern may be identified once all the documents requested were submitted and then reviewed.

AOC 1– 40 C.F.R. §68.65 Process Safety Information

The owner or operator shall complete a compilation of written process safety information before conducting any process hazard analysis required by the rule. The compilation of written process safety information is to enable the owner or operator and the employees involved in operating the process to identify and understand the hazards posed by those processes involving regulated substances.

68.65(d)(1)(iv) This process safety information shall include information pertaining to the equipment in the process; relief system design and design basis.

As of April 24, 2023, Pasadena Refinery failed to provide the EPA a copy of its most recent relief study which documents the current status, calculation accuracy, and functioning of pressure relief valves and the pressure relief system design. Pasadena Refinery failed to document that it corrected the following deficiencies in pressure relief valves and the pressure relief system design between 2018-2023. The 2008 Invensys study found that the following deficiencies in the pressure relief valves and the pressure relief system had not been corrected:

- 13 relief valves are undersized and need to be replaced;
- 9 relief valves have high back pressures and need to be replaced by bellows valves;
- 2 lateral sub-headers need to be replaced to prevent high back pressures on the relief valves; and,
- 18 relief have undersized outlet piping, causing line velocities to exceed 90% of critical flow velocity limits.

As of April 2023, and as identified in the 2021 compliance audit, Pasadena Refinery failed to document that accurate design calculations had been completed for the following seven (7) pressure safety valves:

- 50-PSV-1302
- 50-PSV-1305
- 50-PSV-1306
- 62-PSV-3301
- 62-PSV-3303
- 80-PSV-3301
- 80-PSV-3304

As of April 2023, and as identified in the 2020 Crude Sour Water PHA and the 2020 Reformer #3 PHA, Pasadena Refinery failed to document the accurate design and design basis for the following equipment areas:

- Crude Sour Water System
Item 1 - Potential 51-E-2 Overhead Condenser overpressure scenario and the potential need for overpressure protection if the 51-E-2 shell side outlet is blocked, resulting in potential overpressure and hydrocarbon release.
- Reformer #3
 - ⊖ Item 15 - Evaluate the PSV and associated piping relief considerations for PSV-1319 on the D-591 Deaerator Feed Drum vapor outlet routed to the flare. PSV-1319 may not be adequately sized for potential reverse flow through pumps P-007 and P-008 due to pump failure.
 - ⊖ Item 17 - Evaluate relief considerations for PSV-1310 on the T-553 Hydrotreater Stripper vapor outlet routed to the flare for potential two-phase flow, consistent with Pasadena Refinery Hydroprocessing best practices.

- Item 20 - Evaluate the potential for the E-202 Light Reformate Cooler overpressure scenario to evaluate the potential need for overpressure protection. Flow valve FV-7008 between E-202 and the T-201 Reformate Splitter can malfunction in a closed position and block the relief path of E-202 on the shell side to PSV-1134 on the vapor outlet of T-201. Unable to risk rank this scenario.

AOC 2– 40 C.F.R. §68.65 Process Safety Information

68.65(d)(1)(v) This process safety information shall include information pertaining to the equipment in the process: Ventilation system design.

As of April 2023, and as identified in the 2021 compliance audit, Pasadena Refinery failed to document ventilation system design and maintenance information for three shelter-in-place buildings: Administration Building (#1), Operations Building (#18), and the Refinery Lab (#19). Additionally, Pasadena Refinery failed to document that the building pressurization systems were adequately maintained, as evidenced by active pressure alarms on 6 of 8 buildings during the audit. The following buildings, located in Class 1 Division 2 areas, had active alarms: 73 Boiler House #3 Lab, 76 Boiler House #3 Control Room, 82 FCC Unit MCC, 93 Complex 2400V substation, 88A Complex UPS room, and 88B Complex battery room.

The 2020 Sour Water Facility Siting Checklist indicated that there is a need for enhanced HVAC design for occupied buildings. The checklist stated the following: *“For occupied buildings that could be subjected to toxic materials, does the HVAC design prevent toxic material ingress to the building interior? Do personnel receive an alarm if the HVAC system is not functioning as designed? (Answer is: No, currently under evaluation for the need for enhanced HVAC design).”*

The 2020 Reformer #3 PHA contains a finding recommending an evaluation of the Refinery Control Center (RCC) existing pressurization system condition to determine whether pressurization system modifications are required. The concern is that the age of the RCC pressurization system may result in potential inadequate protection during emergency scenarios.

AOC 3 – 40 C.F.R. §68.67(c)(5)) Process Hazard Analysis Stationary Source Siting

The owner or operator shall perform an initial process hazard analysis (hazard evaluation) on processes covered by this part. The process hazard analysis shall be appropriate to the complexity of the process and shall identify, evaluate, and control the hazards involved in the process.

Pasadena Refinery failed to evaluate and identify controls for the potential hazards of explosion, fire, and toxic vapors to occupied buildings located outside of the security fence including office trailers and office buildings. Pasadena Refinery also failed to conduct a hazard analysis appropriate to the complexity of the process by not performing a toxics evaluation addressing hydrogen fluoride or chlorine from May 2019 to April 2023. The Pasadena Refinery PHA facility siting checklists are not adequate for the complexity of the process in that they do not include fields to address the recommendations from the 2012 AERE Facility Siting Evaluation, nor do they take into consideration or reflect the following: the current configuration of the facility (e.g., units that are now not operational, units that will change operation, etc.); significant changes to operations, processes, or equipment; the construction of new buildings; modification of an existing building; or, changes in a building's occupancy status. The 2012 AERE study is also obsolete, and there has been no update or facility siting re-evaluation that reflects the changes that have occurred since 2012 involving operations, processes,

equipment, or chemical inventory.

AOC 4 – 40 C.F.R. §68.67(e) Process Hazard Analysis

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.

As of April 2023, Pasadena Refinery failed to ensure that Finding 1 in the 2018 compliance audit, indicating that PHA recommendations were not promptly addressed, was corrected. The failure to promptly address PHA recommendations was also identified in the 2021 compliance audit as a deficiency. The 2021 compliance audit identified the following PHA findings that were open:

- 24 open recommendations dating back 2010;
- 85 of 115 recommendations for 2021 were still open; and,
- 72 of 85 recommendations did not have any documentation of an action plan.

EPA's inspection identified the following open PHA recommendations from the most recent two process hazard analyses for the Reformer #3 Unit, Crude Unit, NaSH Unit, and Sour Water Unit. Pasadena Refinery failed to promptly address, to document what actions were taken, to develop a written schedule and target date for when the actions were to be completed:

- Reformer #3 and Reformate Splitter – For the September 2020 PHA, 21 of 23 recommendations remain open. For the July 2015 PHA, 6 of 21 recommendations remain open.
- Crude Unit #50 – For the October 2020 PHA, 22 of 31 recommendations remain open. For the August 2015 PHA, 1 recommendation remains open.
- Crude Sour Water Unit #51 – For the October 2020 PHA,

These recommendations remained open and have not been resolved in a timely manner.

Pasadena Refinery failed to promptly address the PHA findings, to document what actions would be taken, and to develop a written schedule of when the actions would be completed for the following findings identified in the 2020 Crude Sour Water Facility Siting Checklist:

- Determine if the structural design is sufficient to withstand blast overpressures resulting from accidental incident events (vapor cloud explosions, dust explosions, pressure valve ruptures, boiling liquid expanding vapor explosions, etc.) in nearby processing facilities without serious personnel injury or damage to safety critical equipment. This was also a finding in the 2015 Crude Sour Water Facility System Siting Checklist [*Block house needs upgrade. See Recommendation #14 from 2011 Reformer #3 PHA*].
- Determine if the building meets current company, industry, or insurance siting criteria relative to the hazards of nearby processing or storage facilities.
- Determine for occupied buildings if there are potential adverse impacts to occupants from a nearby release of toxic material.
- Determine for occupied buildings that could be subjected to adverse effects of toxic materials, if the HVAC design is adequate to prevent toxic material ingress to the building interior, and if personnel

receive an alarm if the HVAC system is not functioning as designed.

- Determine if the building is equipped with a fire suppression system appropriate to the building function and the materials and equipment located in the building. There is no apparent fire suppression system in zones 1 and 2 at the blockhouse. This was also identified as a finding in the 2020 Reformer #3 Facility Siting Checklist.

Pasadena Refinery failed to promptly address PHA findings, to document what actions would be taken, and to develop a written schedule of when the actions would be completed for the following findings identified in the 2019 NaSH Facility Siting Checklist:

- Determine if fire monitors and other alarms are sufficient to reach all areas, if they are accessible during a fire, and if firefighting response time is adequate.
- Identify the capabilities needed to handle all contingency situations.
- Determine how vulnerable the fire water system is to the hazards the system is intended to mitigate.
- Evaluate the need for a deluge water system on C3/C4 absorber and coalescer and review the previous LPG deluge assessment. This was also a finding in the 2014 NaSH Facility Siting Checklist.
- Determine if fireproofing is adequate. This was also a finding in the 2014 NaSH Facility Siting Checklist.

Pasadena Refinery failed to promptly address PHA findings, to document what actions would be taken, and to develop a written schedule of when the actions would be completed for the following findings identified in the 2020 Reformer #3 PHA:

- Determine for normally unoccupied buildings, where a hazardous atmosphere could develop (such as analyzer buildings), if the buildings are equipped with gas analyzers, detectors, or some other means to alert personnel entering these buildings that a hazard exists.
- Determine whether building modifications are required to address unsafe conditions at the Zone 3/4 Blockhouse and communicate the findings to the QRS/BSA team lead. Previous studies (e.g., August 2006 RRS Facility Siting Report) identified a potential risk to the Zone 3/4 Blockhouse above the Pasadena Refinery acceptable risk threshold of 1E-04. The PHA team was unable to risk rank the building conditions. This recommendation superseded the 2010 PHA Recommendation #14 and the 2015 PHA Recommendation #13.
- Determine if all buried equipment (e.g., process lines, fire water lines, electrical conduit, and sewers) have been identified on drawings and by aboveground markers as appropriate.

AOC 5– 40 C.F.R. §68.69(b) Operating procedures.

Operating procedures shall be readily accessible to employees who work in or maintain a process.

Pasadena Refinery failed to ensure that paper copies of the emergency shut down and emergency operating procedures were readily accessible to employees who work in the control rooms or maintain a covered process in the event of a power failure at the facility.

AOC 6– 40 C.F.R. §68.69(c) Operating Procedures

The operating procedures shall be reviewed as often as necessary to assure that they reflect current operating practice, including changes that result from changes in process chemicals, technology, and equipment, and changes to stationary sources. The owner or operator shall certify annually that these operating procedures are current and accurate.

Pasadena Refinery failed to certify annually the following operating procedures are current and accurate for the following:

- Zone 3 operating procedures, which include the Reformer units, NaSH, liquefied petroleum gas unit (LPG), Flare Gas Recovery unit, and the Sulfur Recovery Unit.
- The operating procedures for the Reformer Unit were certified 12/16/2021 and 2/23/2023. No annual certifications were provided for 2020 or 2022.
- Procedures for the NaSH Unit were certified 2/23/2023. No annual certifications were provided for 2020-2022.
- Procedures for the Flare Gas Recovery Unit were certified 2/23/2023. No annual certifications were provided for 2020-2022.
- Procedures for the Crude Unit and Hydrotreater Unit were certified 12/31/2021 and 2/8/2023. No annual certifications were provided for 2020 or 2022.
- The LPG unit procedures were certified 12/16/2021. No annual certifications were provided in 2020, 2022-2023.
- Sulfur Recovery Unit were certified in 12/16/2021; no annual certifications were provided for 2020, 2022 or 2023.
- Pasadena Refinery also failed to review the operating procedures to ensure they are current and accurate.

AOC 7– 40 C.F.R. §68.71(a)(1) Initial Training

Each employee presently involved in operating a process, and each employee before being involved in operating a newly assigned process, shall be trained in an overview of the process and in the operating procedures as specified in § 68.69. The training shall include emphasis on the specific safety and health hazards, emergency operations including shutdown, and safe work practices applicable to the employee's job tasks.

Pasadena Refinery did not ensure that an operator had received the initial qualification training for the Hydrotreater Unit.

AOC 8– 40 C.F.R. §68.71(b) Refresher Training

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.

Pasadena Refinery did not ensure that an operator completed the refresher qualification training from 2017-2022 for the Crude Unit.

AOC 9– 40 C.F.R. §68.73(b) Mechanical Integrity Written Procedures

The owner or operator shall establish and implement written procedures to maintain the on-going integrity of process equipment.

1. Pasadena Refinery failed to implement its written mechanical integrity program by not ensuring that isometric drawings are developed or that they accurately reflect the ultrasonic NDE testing performed

for the following piping circuits:

- Piping circuit 12"-FG-5020-A (D-596 Fuel Gas Knockout Drum).
- Piping circuit 12"-FG-5020-A, depicting condition monitoring locations for CMLs 1-29.
- Piping circuit 12"-FG-5019-A (D-596 Fuel Gas Knockout Drum).
- Piping circuit 12"-FG-5019-A, depicting CMLs 9-14.
- Piping circuit 6" P-0112-A (Desalter).
- Piping circuit 6" P-0112-A, which identifies CMLs 7-9, 26-29, and 50-52. The data from these test points are not included in the ultrasonic testing data spreadsheet.
- Piping circuit 16" F-303-15A (D-2 Flare Knockout Drum).
- Piping circuit 16" F-303-15A, depicting CMLs 1-10.
- Piping circuit 36" P-5019-1CB1.
- Piping circuit 36" P-5014-1CB1, depicting CMLs 1-12.

2. Pasadena Refinery failed to implement its written mechanical integrity program by not ensuring that ultrasonic NDE was performed on Reactors 100 and 101 in accordance with API 510 and API 570.

3. Pasadena Refinery also failed to develop and implement written procedures requiring ultrasonic testing and external inspections for chemical injection piping line 1.5"-P-2069 A2A2. Pasadena Refinery failed to provide documentation of ultrasonic testing data for some pressure vessels included in the mechanical integrity program that conforms to the requirements of recognized and generally accepted good engineering practices such as API 510.

4. CMLs located on the following pressure vessels were due for ultrasonic NDE and thickness measurement testing prior to EPA's inspection; however, testing has not been performed:

- E-8 LGO Crude Product Exchanger - CMLs 1.01-1.05, 2.11-2.14, 2.42-2.44, were due for ultrasonic testing on 10/6/2021 and 2.51-2.54 were due for ultrasonic testing on 12/7/2021.
- D-554 HydroStripper Receiver (Treater Tower)
 - CMLs 5.01 was due for ultrasonic testing on 1/19/2023.
 - CMLs 9.01 was due for ultrasonic testing on 7/23/2022.
 - CMLs 10.01 was due for ultrasonic testing on 9/10/2022.
- D-2 Flare Knockout Drum
 - CMLs 2.25 was due for ultrasonic testing on 12/11/2022.
 - CMLs 2.31 was due for ultrasonic testing on 2/24/2023.
 - CMLs 2.41 was due for ultrasonic testing on 4/13/2023.
 - CMLs 2.42 was due for ultrasonic testing on 1/1/2023.
 - CMLs 2.43 was due for ultrasonic testing on 12/2/2022.
- D-200 Flare Knockout Drum
 - CMLs 5.01 was due for ultrasonic testing on 2/25/2023.
 - CMLs 11.01 was due for ultrasonic testing on 3/27/2022.
 - CMLs 14.01 was due for ultrasonic testing on 4/13/2023.
 - CMLs 18.01 was due for ultrasonic testing on 9/20/2022.
 - CMLs 20.01 was due for ultrasonic testing on 7/3/2022.
 - CMLs 21.01 was due for ultrasonic testing on 4/26/2023.
- The following CMLs missed their next inspection due date, and have passed their projected

retirement date:

32c-D-2

- CML 2.45 was due for ultrasonic testing on 3/13/2022 and the projected retirement date (9/23/2022) has been exceeded.
- CML 2.32 and 2.36 were due for ultrasonic testing on 7/7/2022 and the projected retirement date (5/13/2023) has been exceeded.
- CML 2.44 was due for the next inspection on 8/1/2021 and the thickness of the piping is already less than the thickness predicted for its projected retirement date of 8/1/2021.

32b-D-200

- CML 3.03 was due for ultrasonic testing on 8/14/2021 and the projected retirement date (9/15/2022) has been exceeded.
- CML 7.01 was due for ultrasonic testing on 2/26/2019 and the projected retirement date (2/26/2019) has been exceeded.
- CML 9.01 was due for ultrasonic testing on 8/28/2021 and the projected retirement date (10/13/2022) has been exceeded.
- CML 10.01 was due for ultrasonic testing on 1/22/2021 and the projected retirement date (8/2/2021) has been exceeded.
- CML 13.01 was due for ultrasonic testing on 6/8/2008 and the projected retirement date (6/8/2008) has been exceeded.
- CML 15.01 was due for ultrasonic testing on 11/2/2021 and the projected retirement date (2/21/2023) has been exceeded.
- CML 23.01 was due for inspection 9/6/2021 and the thickness of the piping is already less than the thickness predicted for its retirement date of 10/30/2022.

5. Pasadena Refinery failed to develop a written inspection and testing program for control system components, including trip switches, interlocks, alarms, indicators, and other control devices. These control devices were not periodically tested in accordance with the manufacturer's recommendations, or using another established protocol, to verify instrumentation integrity and to provide assurance that the system or device will function as intended upon demand. The information and data derived from such inspections and tests must also be documented in a record system. This deficiency was identified in the 2020 Reformer #3 Unit PHA and the 2021 compliance audit, which indicated that the following equipment components had not been tested:

- LAL 6401;
- TAHH-131;
- MD P1/1B check valve;
- AI 38043 area at $\frac{3}{4}$ LEL;
- FSL-0404; and,
- Deluge system in P-2NB area.

AOE 10– 40 C.F.R. §68.73(d)(1) Mechanical Integrity Inspection and Testing.

Inspections and tests shall be performed on process equipment.

As of April 2023, Pasadena Refinery failed to develop or implement a written inspection and testing program to document that the building pressurized ventilation systems operated in accordance with intended design and function for three shelter-in-place buildings: Administration Building (#1), Operations Building (#18), and the Refinery Lab (#19). Additionally, Pasadena Refinery failed to develop

or implement a written inspection and testing program to document that the building pressurization ventilation systems were operating in accordance with intended design and function for the following buildings, located in Class 1 Division 2 areas:

- 73 Boiler House #3 Lab;
- 76 Boiler House #3 Control Room;
- 82 FCC Unit MCC;
- 93 Complex 2400V substation;
- 88A Complex UPS room; and,
- 88B Complex battery room.

AOC 11-40 C.F.R. §68.73(d)(2) Mechanical Integrity

Inspection and testing procedures shall follow recognized and generally accepted good engineering practices.

1. Pasadena Refinery failed to perform ultrasonic inspection and testing every five years for Class 1 piping at identified CMLs on the following piping circuits, in accordance with API 570 and API 574 :

- 6" P-0112-A (Desalter) - This is Class 1 piping, which requires a 5-year ultrasonic testing schedule.
 - CMLs 42.00 and 46.00 were due for ultrasonic testing on 9/22/2021, but testing had not been performed.
 - CMLs 42.01 was due for ultrasonic testing on 5/5/2019, but testing had not been performed.
- Piping 10" P-0108-B (Desalter) - This is Class 1 piping, which requires a 5-year ultrasonic testing schedule.
 - CMLs 81.01, 81.03, 85.01, 103.01-137.01, and 139 are on a ten-year ultrasonic testing schedule.
 - CMLs 81.01, 81.03, 85.01, 103.01-137.01, and 139 - testing was not performed at the required 5-year intervals.
 - CML 85.01 and 106.01 were not tested by the 10-year scheduled due date of 3/1/23.
- 8"-P-0502-A Flare line relief (T-4 Debutanizer Tower) - The isometric drawing indicates that this is Class 1 piping, which requires inspections at 5-year intervals.
 - For CMLs 4.01-7.01, ultrasonic testing was last performed 4/16/2015, and the next inspection due date was 4/16/2020; however, testing was not performed.
 - For CMLs 8.01-20.01, ultrasonic testing was last performed 1/25/2017, and the next inspection due date was 1/25/2022; however, testing was not performed.
- 12"-P-0601-A (T-5 Dehexanizer Tower) - This is Class 1 piping, which requires a 5-year ultrasonic testing schedule.
 - CML 1.30 and 3.01 were due for ultrasonic testing on 6/15/2022, but testing had not been performed.
 - CML 4.01 was due for ultrasonic testing on 6/20/2021, but testing had not been performed.
 - CMLs 5.01-11.01 were due for ultrasonic testing on 2/2/2022, but testing had not been performed.
- Piping 4"-P-6003-15K (V-1 Sour Water Accumulator) - CMLs 16-18 were due for ultrasonic testing on 5/18/2022, but testing was not performed by the due date.
- Piping 10"-P-2009-E5B2 (R-599 Hydrotreater) - Ultrasonic testing was not performed by the due date of 7/24/2022 for CMLs 1-25.
- Piping 4"-P-2068-A2A2 (T-553 Hydrotreater Stripper) - Ultrasonic testing for CMLs 1-19, 12, and 14-25 were not completed by the 5-year due dates of 2/26/2023 or 3/25/2023, respectively.

- 6"-P-2021-A2B2 (T-553 Hydrotreater Stripper) - This is Class 1 piping, which requires a 5-year ultrasonic testing schedule.
 - For CML 3, ultrasonic testing was last performed 8/5/2015, and the next inspection due date was 8/5/2020; however, testing was not performed.
 - For CMLs 4, 8, 12, and 13, ultrasonic testing was last performed 8/4/2016, and the next inspection due date was 8/4/2021; however, testing was not performed.
 - For CMLs 1, 5, 9-11, and 16-18, ultrasonic testing was last performed 4/3/2017, and the next inspection due date was 4/3/2022; however, testing was not performed.
- Piping 26"-P-1004 E2B1 and Piping 20"-P-1004 E2B1 (R-560/561/562)
 - CMLs 3 and 7 were due for ultrasonic testing on 5/12/2019; however, testing was not performed.
 - CML 9 was due for ultrasonic testing on 2/4/2021; however, testing was not performed.
 - CML 6 was due for ultrasonic testing on 3/13/2023; however, testing was not performed.
 - CMLs 2 and 8 were due for ultrasonic testing on 4/3/2023; however, testing was not performed.
- Piping 1"-P-2073 B4B2 (D-554 Hydrostripper Receiver)
 - Ultrasonic testing was not performed by the due date of 2/9/2023 for CMLs 1-13.
 - Ultrasonic testing was not performed by the due date of 3/26/2022 for CMLs 3, 4, 6, 7, 11-15, and 17-22.
 - Ultrasonic testing was not performed by the due date of 3/9/2023 for CMLs 27-30.
- Piping 36"-P-5014-1CB1 (D-200 Flare Knockout Drum)
 - Ultrasonic testing was not performed by the due date of 2/4/2023 for CML 40.01.
 - Ultrasonic testing was not performed by the due date of 3/14/2022 for CML 43.01.
 - Ultrasonic testing was not performed by the due date of 3/26/2022 for CMLs 3, 4, 6, 7, 11-15, and 17-22.
- Piping 3" NSH-1011-15N (D-104 Degassing Drum)
 - CMLs 4.01 and 13.0 were due for ultrasonic testing on 8/21/2022; however, testing was not performed.
 - CMLs 1-3, 5-7, 14-20, and 24-26 were due for ultrasonic testing on 3/4/2023; however, testing was not performed.

2. Piping 16" F-303-15A (D-2 Flare Knockout Drum)

Pasadena Refinery failed to calculate short-term and long-term corrosion rates, and next inspection dates or a retirement date for piping circuit 16" F-303-15A (D-12 flare piping) in accordance with API 570 and API 574. Pasadena Refinery also failed to conduct ultrasonic testing thickness measurements on this piping circuit in accordance with API 570 Section 6.33, Table 1, which requires that thickness measurements be performed at 5-year intervals. Thickness measurements were performed in November 2017 on this piping circuit, and the next inspection was required by November 2022. However, at the time of EPA's RMP inspection, no thickness measurements had been performed. Pasadena Refinery failed to conduct an external inspection on this same piping circuit in accordance with API 570 Section 6.33, Table 1, which requires that an external inspection be performed at five-year intervals. An external inspection was performed on this piping circuit on 12/1/2016, and the next inspection was required by 12/1/2021. However, at the time of EPA's RMP inspection, no external inspection had been performed.

3. Pasadena Refinery failed to conduct ultrasonic NDE testing for small bore piping such as, but not limited to, piping circuit 2"-P-8210-1CB4501 in accordance with API 570 Sections 5.7.

4. The facility also failed to perform external inspections for the following piping circuits, which were all overdue for inspection as of April 24, 2023, in accordance with API 570, Section 6.33, Table 1 or API 510.

- Piping circuits in the LTO Unit 30, which are required to have external inspections every five years, were not inspected by their respective due dates:
 - CRUDENAP L002, FUELGAS L001, GASOLINE L004 and L005, HEAVYNAP L001 and L002, REGENNAOH L001-L004, and VENTGAS L001, were due for inspection by November 10, 2022;
 - FLARE L001 and L002 were due for inspection by October 4, 2022;
 - RICH OIL L001 and L002 were due for inspection by October 4, 2022; and,
 - LSR L001 was due for inspection by October 10, 2022.
- Piping circuits in the LPG-2 Unit 32, which are required to have external inspections every five years, were not inspected by their respective due dates:
 - C3 Products: L001-L003 were due for inspection by August 5 and 6, 2014;
 - COLD FLARE: L001 and L002 were due for inspection by August 4 and 8, 2014;
 - DEC1FEED: L001-L005 were due for inspection by August 6-8, 2014;
 - DEHYD GAS: L001-L004, L006 L009, and L010 were due for inspection by August 5-7, 2014;
 - EXPGAS: L001 and L002 were due for inspection by August 3-4, 2014;
 - FEED GAS: L001-L009 were due for inspection by August 3, 2014;
 - LEANGAS: L001, L002, L004, and L005 were due for inspection by August 5-6, 2014;
 - LIQUIDS: L001- L003 were due for inspection by August 7 and 10, 2014;
 - NON-ACID: FLARE L001 was due for inspection by August 14, 2014;
 - RECYCLE GAS: L001 was due for inspection by August 3, 2014;
 - REGEN GAS: L001-L004 were due for inspection by August 3, 2014; and,
 - RICH AMINE: L001 was due for inspection by August 10, 2014.
- Piping circuits in the Sulfur Plant Unit 35, which are required to have external inspections every five years, were not inspected by their respective due dates:
 - ACID GAS: L002, L005, L007, L008, and L011 were due for inspection September 2-4, 2014;
 - AMINEREGEN: L001 and L004 were due for inspection September 2-3, 2014;
 - LEANAMINE: L002-L005 were due for inspection September 3, 4, 9, 2014.
 - LEANAMINE: L001 was due for inspection June 23, 2015.
 - RICH SOLVENT: L003 was due for inspection September 2, 2014.
 - SWGAS: L002 was due for inspection September 3, 2014.
 - TAIL GAS: L003 was due for inspection September 2, 2014.
 - TAIL GAS: L001 was due for inspection October 22, 2017.
- Piping circuits in the SZORB Unit 37, which are required to have external inspections every five years, were not inspected by their respective due dates:
 - 37 COLD FEED: L001-L003 were due by August 17, 2022;
 - GAS FEED: L003 was due by August 21, 2022;
 - GAS FEED: L007-L009, and L014-L016 were due by August 23, 2022;
 - GAS FEED: L010 L013, and L017 were due by October 3, 4, 2022;
 - GAS FEED: L009 was due by September 16, 2020;
 - NOHYD RELI: L003-L007 were due by September 29, 2020;
 - RECGASHYD: L002-L017, and L019-L021 were due by September 22, 2014; and,
 - RECGASHYD: L0022 was due by December 10, 2014.

- Piping circuits in Crude Unit 50 which are required to have external inspections every five years, were not inspected by their respective due dates:
 - ATMOHVAP: L001 and ATMTWROH: L001-L009 were due by August 12, 2014;
 - DEC6BTM: L001-L004 were due by August 11, 2014;
 - DEC6OH: L004-L005 were due by August 25, 2014;
 - FLARE-001: was due by April 4, 2022;
 - HVGO: L001-L007 were due by August 27, 2014;
 - HVYNAP: L003-L006 were due by August 24, 2014; and,
 - SOUR WATER: L006 and L007 were due by April 4, 2022.
- Piping circuits in the Sour Water Stripper Unit 50, which are required to have external inspections every five years, were not inspected by their respective due dates:
 - Sour Water: L001-L005, and Flare-L001, were due for inspection in March 2014;
 - SWSGAS: L001, L002, and L003 were due for inspection in March 2014;
 - Stripper SW: L001, L002, L003 were due for inspection on March 15, 2019; and,
 - Sour Water: L006, Flare-L002, Flare L005 and FuelGas L001 were due for inspection on January 25, 2023.
- Piping circuits in the Reformer 3 Unit 63, which are required to have external inspections every five years in accordance with API 510, were not inspected by their respective due date of January 1, 2020: 0063-X003-030; 0063-X011-040; 0063-X011-050; 0063-X011-060; 0063-X011-080; and, 0063-X011-090.

5. Pasadena Refinery failed to conduct external inspections of the following pressure vessels every five years (as of April 24, 2023) in accordance with API 510,

- Sulfur Plant Unit 35
 - 35SP01, 35SP02, 35SP01-04, and 35SP01-05 were due for inspection on 3/20/2022; and,
 - 35E720 was due for inspection on 3/11/2022.
- Reformer 3 Unit - 63D568 (by February 2012); 63D582 (by October 2014); 63D585 and 63D589 (by September 2017); 63D599 (by July 2022); and 63D680 (by October 2022).
- SZORB UNIT 37 - 37T01 was not inspected by its due date of February 28, 2023; and, 37D05 was not inspected by its due date of April 10, 2022.
- Sour Water Stripper Unit 51 - 51V1 was not inspected by its due date of July 28, 2022.

6. Pasadena Refinery failed to perform ultrasonic NDE on over 1000 pieces of equipment, piping circuits and pressure vessels which are also overdue for inspection and testing. Numerous piping circuits and pressure vessels have previous thickness measurements which are below the nominal thickness of the pipe or vessel walls, and at least 80 are below their calculated retirement thicknesses as of the date of EPA's inspection. Examples include, but are not limited to, the following:

- Sulfur Plant Unit 35: SOLVEREGEN L001, RICHAMINE L001 and L004, FLAREGAS L003, LEANSOLVENT L004, SPENTNAOH L003, LEANAMINE L002, and SOLVENTSTG L004, and pressure vessels 35TK100 and 35E704;
- Reformer 3 Unit 63: Piping-0063-X007-B03, 0063-X006-B01, and 0063-X008-B10, and Pressure Vessel-63D558SH;
- Depropanizer Unit 80: DEC3FEED-L001;
- Hydrotreater 2 Unit 62: 0062-X980-010, 0062-X940-020, and 0062-X002-020;
- West Flare Unit 32B: SOURWATER-L003, FLAREGAS-L009, and FLAREGAS-L008, and pressure vessel

- 32D200SH-Shell;
- Light Oil Treating Plant Unit 30: 30D50SH-Shell and 30D202A-SH-Shell;
- Reformate Splitter Unit 63A: 0063A-X980-010; and,
- SZORB UNIT 37: 37TK03.

AOC 12– 40 C.F.R. §68.73(e) Mechanical Integrity

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

Pasadena Refinery failed to ensure that equipment inspections were conducted, and equipment deficiencies were corrected, before further use of the equipment, or in a safe and timely manner. The 2021 compliance audit identified at least 683 incomplete fixed equipment inspection recommendations, including:

- 131 which did not have deadlines;
- 586 which were overdue, or which would be if not completed by end of the current calendar year;
- 216 which had no Work Order, or which were not marked for completion during a turnaround or outage; and,
- 20 which did not have assigned risk rankings.

Pasadena Refinery failed to correct the following deficiencies in PRVs and pressure relief systems between May 2019 and May 2023 that were outside acceptable limits, as defined by the April 2008 Invensys Relief Systems Documentation Study. Pasadena Refinery did not provide any documentation that field modifications to address these deficiencies had been completed, or that management of change documentation finalized the changes :

- 21 PSV lines exceed 90% velocity (see Table 1);
- 24 relief valves have high back pressures (see Table 2);
- 14-16 relief valves have inadequate areas (see Table 3); and,
- 41 relief valves have high outlet pressures.

Pasadena Refinery failed to document that atmospheric pressure safety valves in the Crude Unit (50-PSV-1302, PSV 1322 and PSV 1332) and 62-PSV-3303 in the Hydrotreater Unit 62 relieve to a safe location, in accordance with recognized and generally accepted good engineering practices, such as but not limited to, API 521 Section 5.8 and the CCPS Guidelines for Pressure Relief and Effluent Handling Systems. Pasadena Refinery also failed to document that there are accurate design calculations for these atmospheric pressure safety valves in accordance with the same or similar standards. As identified in the 2021 compliance audit, Pasadena Refinery also failed to document that other atmospheric relief valves relieve to a safe location, in accordance with the previously stated recognized and generally accepted good engineering practices and standards. An example of equipment with potential adverse end state consequences included the CRU-OCM-R4 Atmospheric Fractionation Low Atmospheric Tower Bottoms Level: one consequence was "*cavitation and possible damage to Atmospheric Resid (bottoms) Pump*", where the end state that could occur if the operator took no action would be a seal leak and fire. Another example was the High Atmospheric Tower Overhead Temperature: one consequence was "*increase in atmospheric tower pressure*". The end state that could occur if the operator took no action would be the lifting of atmospheric column relief valves to atmosphere, with a potential fire and

environmental release.

AOC 13 - 40 C.F.R. § 68.75(b)(4) Management of Change (MOC)

The procedures shall assure that the following considerations are addressed prior to any change; the necessary time-period for the change.

As identified in the 2021 Compliance Audit, Pasadena Refinery failed to ensure that management of change orders dated from 2015 to 2021 were completed by the specified target dates, and the necessary time periods were not revised to accurately reflect the actual time periods for the changes or indicate when the equipment was returned to original service. The following 15 temporary MOCs and 1 emergency MOC were not completed by the target dates specified in the MOCs:

- Temporary MOCs - 2018-72-189, 2020-14A-206, 2020-14A-89, 2021-14a-174, 2011-25-50, 2020-25-214, 2021-25-105, 2019-32-219, 2019-30-59, 2016-98-80, 2017-14s-178, 2018-14S-209, 2020-63-164, 2021-63-58, and 2015-82-35; and,
- Emergency MOC 2019-14D-45.

AOC 14 - 40 C.F.R. § 68.75(e) Management of Change

If a change covered by this paragraph results in a change in the operating procedures or practices required by §68.69, such procedures or practices shall be updated accordingly.

As identified in the 2021 Compliance Audit, Pasadena Refinery failed to ensure that operating procedures were updated when required by the following MOCs from 2017 to 2021: MOC Nos. 2021-72-78, 2020-14A-206, 2020-50-260, 2021-50-76, 2019-70b-215, 2019-32-219, 2019-14D-248 2016-98-80, 2017-14s-178, and 2020-63-164.

AOC 15 – 40 C.F.R. § 68.77(a) Pre-startup Safety Review (PSSR)

The owner or operator shall perform a pre-start up safety review for new stationary sources and for modified stationary sources when the modification is significant enough to require a change in the process safety information.

As identified in the 2021 Compliance Audit, Pasadena Refinery failed to ensure that a PSSR was attached to fourteen (14) of 52 MOCs dated from 2011 to 2021 which were marked as "PSSR required": MOCs 2019-72-23, 2019-72-35, 2021-72-78, 2020-14A-206, 2020-14a-26, 2011-25-50, 2019-50-276, 2019-70b-215, 2021-70b-27, 2019-32-142, 2019-32-219, 2019-14D-45, 2019-63-205, and 2020-50-166. As also identified in the PRSI 2021 compliance audit, eight (8) of 52 MOCs dated from 2017-2020 that contained PSSRs were inadequate in that the PSSR either did not identify the associated MOC number, did not address the change identified in the MOC, or the PSSR record was not fully completed: MOCs 2019-50-139, 2020-50-77, 2020-62-201, 2019-14D-248, 2017-14s-178, 2020-50-105, 2020-50-118, and 2020-50-159.

AOC 16 - 40 C.F.R. §68.79(d) Compliance Audit

The owner or operator shall promptly determine and document an appropriate response to each of the findings of the compliance audit, and document that deficiencies have been corrected.

Pasadena Refinery did not ensure that findings identified in compliance audits were promptly corrected. As of April 2023, Pasadena Refinery failed to ensure that finding #1 in the 2018 compliance audit,

indicating that PHA recommendations were promptly addressed, had been corrected. The failure to promptly address PHA recommendations was also identified as a finding in the 2021 compliance audit. The 2021 compliance audit identified the following PHA deficiencies:

- 24 open recommendations dating back 2010;
- 85 of 115 recommendations were still open; and,
- 72 of 85 recommendations did not have any documentation of an action plan.

As of April 2023, Pasadena Refinery failed to ensure that finding #3 in the 2018 compliance audit, indicating that operating procedures were not being reviewed annually, had been corrected. The failure to annually certify operating procedures was also identified in the 2021 compliance audit. Pasadena Refinery also failed to promptly determine and document an appropriate response to each of the following findings in the 2021 compliance audit, and that the deficiencies have been corrected: #3.2.6.2, #3.2.7, #3.2.8.1, #3.2.8.2, #3.4.6, #3.8.1, #3.8.2, #3.9.5.1, #3.10.1.2, #3.10.4, #3.10.5.1, and #3.13.5.

AOC 17 - 40 C.F.R. §68.190 Updates

§68.190(b)(6) The owner or operator of a stationary source shall revise and update the RMP submitted under § 68.150 within six months of a change that requires a revised off-site consequence analysis as provided in §68.36.

Pasadena Refinery failed to submit a revised RMP registration with updated worst-case toxics release scenario after they discontinued operation of the Alkylation Unit and discontinued use of hydrogen fluoride, which had been used as the basis for the worst-case off-site consequence analysis. As of August 11, 2023, no revised RMP had been submitted.

Section IV – POST-INSPECTION FOLLOW UP

Additional documents were provided via SharePoint on May 4, 5, 9, and 16, 2023, by Pasadena Refinery following the inspection and after exiting the facility on April 28, 2023. At the closing conference some areas of concern were discussed, along with Confidential Business Information and additional supporting data related to the Areas of Concern. As of the date of this inspection report, Pasadena Refinery has not provided documents requested related to the progress of its latest Pressure Relief Study, or a spreadsheet identifying which operating procedures which were not being reviewed annually.

Section V – LIST OF APPENDICES

There are no appendices to the inspection report.