

Region 6 - Enforcement & Compliance Assurance Division

INSPECTION REPORT

Inspection Date(s):	March 25-29, 2024		
Media:	Air		
Regulatory Program(s)	Clean Air Act Section 112(r) and 40 C.F.R. Part 68 Chemical Accident Prevention Provisions - Risk Management Program (RMP)		
Company Name:	Marathon Petroleum Corporation		
Facility Name:	Marathon Petroleum Company LP, Louisiana Refining Division		
Facility Physical Location:	Highway 61 at Marathon Avenue		
(city, state, zip code)	Garyville, Louisiana 70051-0849		
Mailing address:	Highway 61 at Marathon Avenue		
(city, state, zip code)	Garyville, Louisiana 70051-0849		
County/Parish:	St. John the Baptist Parish		
Facility Contact:	Jeremy Beasley	Environmental, Safety & Security Manager	
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FRS Number:			
Identification/Permit Number:	1000 0010 5726		
NAICS:	32411 Petroleum Refineries		
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SECTION I - INTRODUCTION

PURPOSE OF THE INSPECTION

United States Environmental Protection Agency (EPA), Region 6 inspectors I, Howard Cole, Aimee Boss, and Kristen Latiolais visited the Marathon Petroleum Company LP, ("Marathon") facility in Garyville, Louisiana on March 25-29, 2024. We met with Casey Berniard, Process Safety Management Supervisor, for an opening meeting. Glen Jenkins from the Louisiana Department of Environmental Quality (LDEQ), Chemical Accident Prevention Program arrived at the site on March 25, 2024, and participated in the inspection.

I presented my credentials and informed Marathon 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 (PCE), which included an evaluation of the facility's compliance with the Clean Air Act (CAA) Section 112(r) and the Chemical Accident Prevention Provisions in 40 C.F.R. Part 68. Marathon's Risk Management Plan (RMP) is listed as a Program Level Three (3), Title V process facility. I inquired if an employee representative was available pursuant to section 112(r)(6)(L) of the CAA to participate in this inspection and was informed that the Marathon site is a non-union facility. Marathon Garyville employs approximately 960 employees and 18,180 corporate-wide.

FACILITY DESCRIPTION

Marathon is located at Highway 61 at Marathon Avenue, Garyville, Louisiana 70051-0849. The facility description given for this report is derived from information directly conveyed by the company. Marathon Garyville Refinery is a full range refinery and petroleum products. The Marathon Garyville Refinery uses crude oil as the feed material and makes a variety of petroleum-based products, including gasoline, diesel fuel, and liquefied petroleum gases such as propane and butane. Many of these products are flammable RMP regulated substances and are present in the process units above the EPA threshold quantity. The covered units are listed in the RMP data included with this summary (Section 1.17 of the RMP Data Elements). The Marathon Garyville Refinery also handles two toxic RMP regulated substances above the threshold quantities; hydrofluoric acid and hydrogen sulfide.

SECTION II - OBSERVATIONS

On Monday, March 24, 2024, accompanied by Marathon staff, we received a driving tour of the facility. On March 27, 2024, we conducted a walkthrough inspection of the facility, with Marathon staff, which included

a discussion of the process, a visit to the areas where previous incidents had occurred and interviews with employees.

Incident Summary

The facility has reported three incidents involving a fire since 2022. An incident occurred on September 24, 2022, involving a fire from Platform A inside Unit 12. The incident was caused by a leak due to atypical oxidation, causing a flange gasket to fail and a release of benzene to the atmosphere.

Another incident occurred on October 5, 2022, involving a fire at the Alky Fractionator pump, in Unit 27. The incident was caused by a leak on the pump releasing hydrocarbon vapors which found an ignition source.

This inspection was prompted by an incident that occurred on August 24, 2023, involving a fire that occurred at the tank farm. On Thursday, August 24, 2023 at 6:38 PM a liquid leak, which contained naphtha, was discovered at storage tank 150-11. Naphtha is a fractional component of crude oil, and a flammable hydrocarbon liquid mixture which includes pentane. Storage Tank 150-11 is surrounded by a secondary dirt containment dike. According to Marathon, vapor suppression and tank de-inventorying of naphtha from the storage tank began immediately.

On Friday, August 25, 2023 at 6:35 AM a fire began outside of the tank in the secondary containment dike around Tank 150-11. At 8:30 AM Tank 150-11 caught fire, prompting St. John the Baptist Parish's precautionary, mandatory evacuation. At 2:00 PM the fire primarily was extinguished, risks diminished; and the evacuation lifted by St. John the Baptist Parish. Intermittent pop-up fires were completely extinguished within the diked area by Monday, August 28, 2023. There were no serious significant injuries resulting from the fire.

The naphtha leaked through the concrete floor of atmospheric storage tank 150-11. It is speculated that the ignition source for the liquid naphtha were electrical lines located underground in the diked area, adjacent to storage tank 150-11. The estimated quantity of naphtha released was 22,013 barrels (924,546 gallons or 5,968,092 lbs). At the time of this inspection, the final incident investigation report has not yet been completed.

Subpart A - General

40 C.F.R. § 68.10 Applicability - Marathon is the owner/operator of a stationary source that has more than a threshold quantity of the RMP regulated chemicals, methane, ethane, propane, butane, butene, isobutane, pentane, pentene, isopentane, ethylene, propylene, and hydrogen and toxics, hydrogen sulfide and hydrogen fluoride, as listed in 40 C.F.R. § 68.130, and as such is subject to the provisions of the Chemical Accident Prevention requirements. Marathon has a Clean Air Act (CAA) Title V Operating Permit, No. 2580-00013-V-28 and a North American Industry Classification System (NAICS) code of 32411-Petroleum Refinery. Marathon also is subject to the Occupational Safety and Health Administration (OSHA) process safety management standard, 29 C.F.R. § 1910.119, and is an EPA RMP Program Level 3 facility.

40 C.F.R. § 68.12 General requirements - Marathon re-submitted their 5-year updated Risk Management Plan as is required by 40 C.F.R. 68.190(b)(1) on February 26, 2024. This re-submission listed the covered processes containing the regulated chemicals. This requires Marathon to implement the program requirements of 40 C.F.R. 68.65 - 68.87, develop and implement an emergency response program, and submit the data elements from 40 C.F.R. 68.175.

40 C.F.R. § 68.15 Management – Marathon has overall responsibility for the development and implementation of the risk management program for EPA-regulated processes. However, the specific responsibilities for certain aspects of that program have been delegated to other personnel who report either directly, or through other management personnel, to the Division Manager. Those relationships are depicted on the division RMP/PSM Organization Chart. Specific responsibility for the implementation of the division Process Safety Management (PSM) and accident prevention programs has been delegated to the Environmental, Safety & Security Manager (ES&S Manager). Similarly, responsibility for the RMP hazard assessment and risk management plan, and the emergency response program, including compliance with the RMP aspects of that effort, is the responsibility of the ES&S Manager.

Subpart B - Hazard Assessment

40 C.F.R. § 68.20 Applicability - Marathon is a RMP Program Level 3 process stationary source subject to this subpart. Marathon is required to prepare an offsite consequence analysis and complete the five-year accident history. The offsite consequence analysis included flammables and toxics, hydrogen sulfide and hydrogen fluoride.

40 C.F.R. § 68.22 Offsite Consequence Analysis Parameters - I reviewed Marathon's offsite consequence analysis and supporting documentation. Marathon used 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. These values are within parameters specified by EPA for the regulated toxic chemicals. Marathon uses "Aloha" as the technique for modeling the release scenarios.

40 C.F.R. § 68.25 Worst-case Release Scenario Analysis - Marathon analyzed and reported in the RMP the worst-case scenario, estimated to create the greatest distance to an endpoint from an accidental release of a regulated toxic substance from a covered process under worst-case conditions. This was determined by analyzing all regulated toxic chemicals and choosing the chemical with the greatest distance to endpoint.

40 C.F.R. § 68.28 Alternative Release Scenario Analysis - Marathon identified and analyzed at least one alternative release scenario for each regulated toxic substance stored in a covered process, using a scenario that is more likely to occur, and which will reach an endpoint off-site.

40 C.F.R. § 68.30 Defining Offsite Impacts - Population - Marathon's off-site impacts documentation did identify the presence of institutions, parks, and recreational areas, major commercial, offices, or industrial buildings in the RMP. The maps provided identified the receptors within a circle. The original RMP hazard assessment documentation provided during the 2019 RMP inspection included the distance to endpoint based on a circle with the release point at the center.

40 C.F.R. § 68.33 Defining Offsite Impacts - Environment - Marathon's off-site impacts documentation did identify the presence of affected environmental receptors.

40 C.F.R. § 68.36 Review and Update - Marathon's most recent off-site consequence analyses were completed in February 2024 during the last RMP re-submission. Marathon ensures that this documentation is reviewed and updated at least once every five years.

40 C.F.R. § 68.39 Documentation - For the worst-case and alternate release scenarios, a description of the vessel or pipeline, the substance selected as worst-case, and the rationale for selection was included;

likewise, assumptions included use of any administrative controls and any passive mitigation that were assumed to limit the quantity that could be released, estimated quantity released, release rate, and duration of release. The "Aloha" methodology was used to determine distance to endpoint. RMP*Comp™ was used to verify the distance to endpoint for each scenario.

40 C.F.R. § 68.42(a)/68.168 Five-year accident history – Marathon reported four accidents from a covered process within the last five years in their February 26, 2024, Risk Management Plan resubmission:

- On August 23, 2023, a flammable mixture of hydrocarbons leaked from a storage tank resulting in a fire.
- On October 5, 2022, during maintenance there was an isobutane leak from piping that formed a vapor cloud which ignited causing a fire and injuring two employees.
- On September 24, 2022, hydrogen released from pressure vessel piping igniting a fire.
- On February 21, 2022, a release of hydrogen gas from piping resulted in a fire.

There was an also an accidental release reported in the latest RMP which occurred on October 31, 2017, and involved the release of 1 pound of hydrogen.

Subpart D - Program 3 Prevention Program

40 C.F.R. § 68.65 Process Safety Information – Marathon keeps a variety of technical documents that are used to help maintain safe operation of the processes. These documents address chemical properties and associated hazards, limits for key process parameters and specific chemical inventories, and equipment design basis/configuration information. Chemical-specific information, including exposure hazards and emergency response/exposure treatment considerations, is provided in Safety Data Sheets (SDS). This information is supplemented by documents that specifically address known corrosion concerns and any known hazards associated with the inadvertent mixing of chemicals. For specific process areas, Marathon has documented safety-related limits for specific process parameters (e.g., temperature, pressure, level, composition) in the operation manuals for each process unit. The Marathon ensures that the process is maintained within these limits by using process controls and monitoring instruments, operating procedures, highly trained personnel, and safety instrument systems (e.g., automated shutdown systems). Marathon also maintains numerous technical documents that provide information about the materials of construction, design pressure and temperature ratings, electrical rating of equipment, etc.

I reviewed 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.

I reviewed the Safety Data Sheets for the eight RMP regulated chemicals used at the facility: hydrogen fluoride, hydrogen sulfide, butane, propane, isopentane, isobutane, propylene, and ethylene to confirm 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. Marathon documented information pertaining to the technology of the process, including block flow diagrams, process chemistry, maximum intended inventory inside the process, safety information procedures, safe upper and lower limits, and an evaluation of consequences of deviation from operating parameter limits.

I reviewed information that contained materials of construction, piping, and instrumentation diagrams (P&IDs), electrical classification, relief system design and design basis, ventilation system design, design codes and standards employed, and safety systems.

A diesel-powered light tower, which was unclassified electrical equipment, was determined to be the ignition source of a flammable vapor cloud. Marathon placed unclassified electrical equipment in a Class 1 Division 2 area. There were several other potential ignition sources located around the area where the leak of flammable vapors occurred. Marathon's electrical classification maps for areas in Unit 215, Unit 12, and Unit 27 did not accurately reflect/depict the appropriate electrical classification based on the hazards of the process and the hazardous chemicals present. **[AOC 1 § 68.65(d)(1)(iii)]**

Marathon failed to document that pressure safety valves and associated pressure relief equipment complied 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
- RSP-1131 and API 520 Part II section 13.1
- ASME Section VIII, Division 1, UG-135
- ASME Section I requirements
- Marathon's guideline RSP-1131-000 Rev.9, Section 6.2.2, evaluated based on Appendix B, Section B.1.7 Figure 6 (High Inlet Pressure Losses). **[AOC 2 § 68.65(d)(2)]**.

40 C.F.R. § 68.67 Process Hazard Analysis (PHA) – Marathon has a comprehensive PHA program to help ensure that hazards associated with the various processes are identified and controlled. Within this program, each existing covered process and future processes are systematically examined to identify hazards and ensure that adequate controls are in place to manage those hazards. Marathon primarily uses the hazard and operability (HAZOP) analysis technique to perform these evaluations. The analyses are conducted using a team of people who have operating and maintenance experience as well as engineering expertise. Consideration of potential offsite effects has been incorporated into all PHA updates completed after August 19, 1996.

The PHA facility siting checklists were not appropriate for the complexity of the process in that they do not address the hazards identified in the ABS Consulting Facility Siting study. **[AOC 3 - 40 C.F.R. § 68.67(a)]**

Marathon completed a compilation of written process safety information when it conducted a facility siting study in 2020. However, Marathon failed to consider and address the results of this facility siting study in PHAs conducted between 2020-2024. Marathon has failed to address or mitigate the hazards of the process involving the flammable and toxic risks to occupied buildings and employees present inside and outside of buildings, as identified in the ABS Consulting, 2020 facility siting study. **[AOC 4 - 40 C.F.R. § 68.67(c)(1) and (c)(5)]**

Marathon failed to develop a mitigation plan based on the findings and recommendations of the facility siting study and as required (Section 5, Remediation) by the ABS Consulting Group. Marathon's established recommendation policy states *"A recommendation can be modified when it can be documented in writing and based on adequate evidence. An approved form must be attached before changing status."* Some PHA recommendations that have been modified or changed did not have an approved recommendation modification form.

The RMP standard requires Marathon to promptly assure that recommendations addressing the hazards are resolved in a timely manner and actions abating these hazards be completed as soon as possible. While additional studies are often necessary to determine the best way to resolve a hazard; a study does not represent closure of a PHA recommendation; and the recommendation must continue in subsequent PHAs until there is mitigation of

the hazard. The PHA must document what actions are to be taken and develop a written schedule of when these actions are to be completed. Marathon has instances in which the process hazard analysis has not promptly assured that recommendations addressing the hazards are resolved in a timely manner and that actions abating these hazards are completed as soon as possible. **[AOC 5 - 40 C.F.R. § 68.67(e)]**

40 C.F.R. § 68.69 Operating Procedures - Marathon has developed and implemented written operating procedures that provide instructions or steps for conducting activities associated with each covered process. Marathon maintains written procedures that address various modes of process operations, such as (1) unit startup, (2) normal operations, (3) temporary operations, (4) emergency shutdown, (5) normal shutdown, and (6) initial startup of a new process. These procedures can be used as a reference by experienced operators and provide a basis for consistent training of new operators. Procedures are periodically reviewed and annually certified by the Area Process Specialist as current and accurate. In addition, the operating procedures provide guidance on how to respond to exceeding safe operating limits for specific process or equipment parameters.

Marathon's written operating procedures did not provide the steps necessary to close the valve that isolates the low-pressure line from high-pressure equipment in Unit 215. **[AOC 6 - 40 C.F.R. § 68.69(a)(1)(vii)]**

Marathon Unit 215 operating procedures were incorrectly certified as being accurate in 2020, 2021, and 2022 when an update to the Unit 215 startup procedure in 2020 removed steps to close the valve from the highpressure line to the low-pressure line and Startup Ejector. **[AOC 7 - 40 C.F.R. § 68.69(c)]**

Marathon failed to develop and implement safe work practices for the maintenance and opening and closing of process equipment; pump (1509-2), and emergency isolation valve (HV-4137). **[AOC 8 - 40 C.F.R. § 68.69(d)]**

40 C.F.R. §68.71 Training – To complement the written procedures for process operations, Marathon has implemented a training program for all employees involved in operating a process. New operations employees receive basic training, known as "Basic Operator Training." After successfully completing this classroom and field training program, a new operator is paired with a senior operator to learn process specific knowledge, process-specific equipment & instrumentation, duties, and tasks (skills). After operators demonstrate (e.g., through tests, skills demonstration, shadowing, walkthroughs) adequate knowledge, understanding, and ability to perform the duties and tasks in a safe manner on their own, they can work independently. In addition, all operators periodically receive refresher training to ensure that their skills and knowledge are maintained at an acceptable level.

40 C.F.R. §68.73 Mechanical Integrity – Marathon has well-established practices and procedures to maintain pressure vessels, piping systems, relief and vent systems, controls, pumps and compressors, and emergency shutdown systems in a safe operating condition. The basic aspects of this program include: (1) conducting training, (2) developing written procedures, (3) performing inspections and tests, (4) correcting identified deficiencies, and (5) applying quality assurance measures. In combination, these activities form a system that maintains the mechanical integrity of the process equipment. Marathon's mechanical integrity inspection group supports inspections and preventative maintenance on tanks, pressure vessels, pressure relief devices, and piping. Marathon manages its inspection and testing using a time-based inspection program. Marathon has selected American Petroleum Industry (API) standards API 510, 521, 570, and 653 as their designated Recognized and Generally Accepted Good Engineering Practices.

I conducted interviews with employees who manage Marathon's mechanical integrity program. Inspection and testing history for pressure vessels, pressure relief valves, storage tanks, and piping were requested to include

U1, external and internal inspections, ultrasonic testing events, and floor evaluations. Inspection and testing files for the following equipment were reviewed:

- **Storage Tanks:**
150-11
- **Pressure Vessels:**
215-1106, 215-1207, 215-1102, 215-1210,
12-302, 12-1208, 12-2501/2502/2503
27-1105, 27-1101, 27-1104, 27-1105, 27-1106, 27-1108, 27-1109, 27-1207
- **Piping Circuits:**
34"-CB2H—12-302-1-SR, 34"-CB2H—12-10-lh, 1"-CH2F-27-1318 IS
6"-CH2F-27-821-lh, 4"-C2-27-763-lh, 6"-CH2F-27-172-lh

12"-A2—27-253, 12"-CH2F-27-1401(MA), 2"CH2F-27-171 (TA), 4"-C2-27-847-lh,
10"-C2-27-217-ls, 4"-CH2F—27-155 (MA), 4"-CH2F—27-191, 3"-CH2F-27-213,
8"-CH2F-27-188 , 6"-CH2F-27-239, 4"-C1-28-828, 2"-A2-27-837
- **Pressure Safety Valves**

PSV 4007, PSE 7052/PSV7047, PSV 4037, PSV 4045, PSV 4054,
PSV 4052, PSV 4050, PSV 4072, PSV 7016

Marathon failed to establish a written mechanical integrity procedure that addresses the identification and replacement of outdated or potentially defective flange gaskets in the Hydrogen Fluoride (HF) Alkylation Unit 27. **[AOC 9 – 40 C.F.R. § 68.73(b)]**

As identified in a compliance audit, Marathon failed to ensure that 14 instrument components identified as an independent protection layer, were included in the mechanical integrity inspection and testing program. **[AOC 10 – 40 C.F.R. § 68.73(d)(1)]**

Marathon did not ensure that piping circuits and pressure vessels received external inspections every 5 years as is required by API 510 and API 570. Marathon did not ensure all inspection and testing were performed on storage tanks in accordance with API 653. **[AOC 11 – 40 C.F.R. § 68.73(d)(2)]**

Marathon did not ensure that equipment deficiencies were corrected before further use or in a safe and timely manner for the following equipment:

- 24" suction emergency isolation valve HV-4137 and pump 1509-2 motor operated emergency isolation valves located at the bottom of spheres 10-1, 25-3, 25-5, 26-6, and 25-7 had damaged and missing fireproofing from March 2020-June 2021.
- Seven instances where field modifications of pressure safety valves/pressure relief system are required in order for a pressure safety valve/pressure relief system to function properly as designed given various scenarios. **[AOC 12 – 40 C.F.R. § 68.73(e)]**

As identified in their 2021 compliance audit, Marathon's failed to implement its Positive Material Identification program (QA/QC Procedure Document # RMP-3025-GV, Revision 5) in that alloy components and alloy weld consumables did not undergo positive material identification analysis as required by corporate procedure Positive Material Identification (PMI) of New and Existing Process Piping Systems (Document #SP-90-20, Revision 12) Section 6.5. **[AOC 13 – 40 C.F.R. § 68.73(f)(3)]**

40 C.F.R. §68.75 Management of Change (MOC) - Marathon has a comprehensive system to manage changes to processes. This system requires that changes to items such as process equipment, chemicals, technology (including process operating conditions), procedures, and other facility changes be properly reviewed and authorized before being implemented. Changes are reviewed to (1) ensure that adequate controls are in place to manage any new hazards and (2) verify that existing controls have not been compromised by the change. Affected chemical hazard information, process technology information, equipment information, and procedures are updated to incorporate these changes. In addition, operating and maintenance personnel are provided with any necessary training on the change.

Marathon failed to implement a management of change to address a material change and installation of updated flange gaskets which were not susceptible to thermal oxidation. **[AOC 14 - 40 C.F.R. § 68.75(a)]**

Marathon failed to implement the management of change process when in 2020 a startup operating procedure was modified to include a "huff and puff section." The modification of the procedure removed steps to close the valve from the high-pressure line to the low-pressure line and Startup Ejector. The vacuum steps were replaced to avoid potential air ingress to the reactor system. Paragraph 68.75(e) requires that changes in operating procedures be managed in accordance with the management of change policy. **[AOC 15 – 40 C.F.R. § 68.75(e)]**

40 C.F.R. §68.77 Pre-startup Safety Review – Marathon conducts a pre-startup safety review (PSSR) for any new facility or facility modification that requires a change in the process safety information (not required for replacement in kind). The purpose of the review is to ensure that safety features, procedures, personnel, and the equipment are appropriately prepared for startup prior to placing the equipment into service. This review provides one additional check to make sure construction is in accordance with the design specifications and that supporting systems are operationally ready. The review team uses checklists to verify all aspects of readiness. A review involves field verification of the construction and serves a quality assurance function. EPA reviewed selected PSSR's.

40 C.F.R. § 68.79 Compliance Audits – To help ensure that the accident prevention program is functioning properly, Marathon periodically conducts compliance audits every three (3) years to confirm the procedures and practices required by the accident prevention program are being implemented. These audits are led by a third-party contractor with assistance by the Marathon Garyville employees as required. The two most recent compliance audit reports, 2021 and 2023, were reviewed.

The 2021 compliance audit failed to address as a compliance audit finding that "the capability of the fixed firewater system, most recently evaluated in a 2019 hydraulic study, noted a deficiency of firewater system pressure in certain tank farm areas."

The 2021 compliance audit failed to address as a compliance audit finding that "a recent internal audit determined many post-startup MOC action items involving PSI updates had been going past the oneyear due date specified by the refinery's procedures."

The 2023 compliance audit failed to address as a compliance audit finding that “the refinery had waves of backlogged MOC post-startup action items after large projects and turnarounds that sometimes were not completed within the one-year post-startup corporate requirement.” **[AOC 16 - 40 C.F.R. § 68.79(c)]**

Marathon failed to promptly determine an appropriate response to a compliance audit finding addressing that no Positive Material Identification (PMI) was being performed on alloy weld consumables. The 2023 compliance audit was completed in November 2023. As of the date of this inspection, March 25-29, 2024, no process had been developed and implemented to ensure that PMI was being performed on alloy weld consumables in accordance with the corporate procedure. The target date for completion is January 2025. **[AOC 17 - 40 C.F.R. § 68.79(d)]**

40 C.F.R. § 68.81 Incident Investigation - Marathon assembles an investigation team depending on the initial assessment of the event. A risk ranking matrix is used to determine the level of investigation. Marathon has "Operational Excellence" meetings periodically to discuss past due action items. Marathon investigates all incidents that resulted in, or reasonably could have resulted in, a fire/explosion, toxic materials release, major property damage, environmental loss, or personal injury. The goal of each investigation is to discover the facts and develop corrective actions to prevent a recurrence of the incident or a similar incident. The investigation team develops recommendations to prevent a recurrence and presents these results to management for resolution. Corrective actions taken in response to the investigation team's findings and recommendations are tracked in the electronic recommendation tracking system until they are complete. The final resolution of each finding or recommendation is documented. Incident investigation reports are retained for at least 5 years so that the reports can be reviewed during future PHA revalidations.

I reviewed selected incident investigations to ensure that: investigations were initiated no later than 48 hours following the incident, there was a description of the incident, the factors that contributed to the incident; any recommendations resulting from the investigation and the findings and recommendations were addressed and resolved promptly.

Marathon failed to establish a system to promptly address and resolve the report findings and recommendations associated with the flange gasket failure on September 24, 2022, in the Unit 12 Reactor Structure fire (incident #350697). Recommendation number 288315 to “identify and replace any reactor circuit gaskets in U12 and U212 that may be susceptible to thermal oxidation during the 4Q23 turnaround.” At the time of this inspection Marathon had not identified or replaced any reactor circuit gaskets and postponed the target date until October 31, 2025. **[AOC 18 - 40 C.F.R. § 68.81(e)]**

40 C.F.R. § 68.83 Employee Participation - Marathon encourages employees to participate in all facets of Process Safety Management and accident prevention. Examples of employee participation range from updating and compiling technical documents and chemical information to participating as a member of a Process Hazard Analysis (PHA), incident investigation, and compliance audit teams. Employees have access to all information created as part of the accident prevention program. Specific ways that employees can be involved in the accident prevention program are documented in an employee participation plan that is maintained at Marathon and addresses each accident prevention program element.

I reviewed Marathon's "Process Safety Management Employee Participation" procedure regarding the implementation of the employee participation required by this subpart. All documentation met the requirements of the RMP rule.

40 C.F.R. §68.85 Hot Work Permit - I reviewed Marathon's hot work procedure. Before hot work begins, an operation's representative inspects the equipment that will be used prior to sign-off. The facility issues hot work permits for hot work operations conducted on or near a covered process for the duration of the current shift. The following shift can revalidate a hot work permit if the work must continue, and the scope of work has not changed.

Some of the hot work permits had not been entirely completed and were missing information. **[AOC 19 40 C.F.R. § 68.85(a) and (b)].**

40 C.F.R. §68.87 Contractors - Marathon uses contractors to supplement its work force throughout the year, as well as during periods of increased maintenance or construction activities. Because some contractors work on or near process equipment, Marathon has procedures in place to ensure that contractors (1) perform their work in a safe manner, (2) have the appropriate knowledge and skills, (3) are aware of the hazards in their workplace, (4) understand what they should do in the event of an emergency, (5) understand and follow site safety rules, and (6) inform Marathon personnel of any hazards that they find during their work. This is accomplished by providing contractors with (1) a process overview, (2) information about safety and health hazards, (3) emergency response plan requirements, (4) safe work practices, and (5) a work permit process (i.e., for hot work, confined space, etc.) prior to their beginning work. In addition, Marathon evaluates contractor safety programs and performance during the selection of a contractor. Marathon personnel periodically monitor contractor performance to ensure that contractors are fulfilling their safety obligations.

Subpart E - Emergency Response

Marathon is designated as a "first responder" in case of an accidental release of regulated substances. In the event of a release, the refinery has well-trained emergency response teams to contain, mitigate, monitor, and stop the release. The refinery has staffed and trained emergency response teams for:

- 1) Firefighting [including the Shift Emergency Response Team (SERT) and the Volunteer Emergency, response Team (VERT)],
- 2) medical emergencies, and
- 3) ambient air monitoring (Air Monitoring Team).

In addition to handling the release, the refinery has also established a wide variety of communication systems through the Local Emergency Planning Commission (LEPC) to alert the community in the event of a significant release. Marathon advises the LEPC, as needed, to notify the local community through cable override systems, radio broadcasts, and/or through an automated telephone notification system (Marathon Alerts).

CAA § 112(r)(1) General Duty Clause -

At the time of the incident, the Fractionator and the Reboiler Pumps were being isolated and de-inventoried for blinding. Three reboiler pumps were isolated and being drained in preparation for blinding. One of the reboiler pumps, Pump 27-1509-02, was found to have the drain lines plugged-up. In the process of attempting to drain the pump, a release of flammable hydrocarbons occurred, subsequently igniting a vapor cloud, causing an explosion and fire which injured two workers. One of the injuries required evacuation by helicopter to a medical facility.

Alky Unit operators reported frequent plugging in the ¾" Reboiler Pump drain lines, caused by iron fluoride which would be a typical corrosion product in this area of the Alky Unit. The operators described the plugging material as very hard "coke." The plugging phenomena had been ongoing for many years. No evidence was found that this plugging phenomenon had been investigated. Operators have unplugged the lines over the years with techniques such as steaming out the lines, rodding out the lines, and replacement of plugged lines with new piping.

The Fractionator Reboiler pumps when being prepared for maintenance are drained to the sewer. Two of the reboiler pumps, 1509-1 and 1509-2, were being drained through temporary tubing attached at the seal flush ystrainer. The installed drain lines have a history of plugging, and this is a means used for draining the reboiler pumps when they are plugged.

When these pumps are prepared for maintenance and drained to the sewer, the local hydrocarbon detectors normally alarm while they are being drained. The hydrocarbon detectors alarming while the reboiler pumps are drained was "normalized" by the operators and not considered a significant hazard. The detector nearest the 1509-2 pump showed 30-50% Lower Explosive Limit (LEL) this entire period. The detector nearest the sewer hub where the pumps were draining, began recording levels as high as 90% LEL. The ignition source for the fire was determined to be a diesel-powered light plant nearly 160 ft from the leak source.

Storage tank 150-11, containing naptha, developed a leak at the tank floor. Naptha leaked outside of the tank, on to the ground surrounding the tank and then seeped beneath the ground. Naptha continued to pool around the storage tank and eventually found an ignition source. Speculation is that the ignition source was a live electrical wiring located beneath the ground. **[AOC - 20 (CAA) § 112(r)(1) General Duty Clause]**

Subpart G - Risk Management Plan

40 C.F.R. § 68.190 Updates - Marathon's RMP was re-submitted as a 5-year update on February 26, 2024.

40 C.F.R. § 68.195 Required corrections - Marathon's next RMP re-submission is due by February 26, 2029, unless an update or correction is required by 40 C.F.R. 68.190 and 40 C.F.R. 68.195.

EPA Region 6 inspectors I, Howard Cole, Aimee Boss, and Kristen Latiolais, conducted a closing conference on March 29, 2024, at which time a few of the findings resulting from the inspection were mentioned; and we indicated additional Areas of Concern may be identified once the team was able to review all the documents provided. Confidential Business Information criteria were explained and a list of all copies of documents that were collected from the site was prepared.

SECTION III - AREAS OF CONCERN

AOC 1 – 40 C.F.R § 68.65 (d)(1)(iii) Process safety information

Information pertaining to the equipment in the process shall include electrical classification.

1. Marathon placed a diesel-powered light tower, which was unclassified electrical equipment, in a Class 1 Division 2 area. Employees while draining a pump of petroleum alkylate and butane released flammable vapors to the ambient environment resulting in a vapor cloud, which was ignited by the diesel-powered light tower.

2. Marathon failed to document the correct electrical classification for areas in Unit 215 EAC215E0001D. The drawing does not accurately reflect/depict the appropriate electrical classification based on the hazards of the process and the hazardous chemicals present (hydrogen, hydrogen sulfide, ammonia, methane, ethane, propane, butane and pentane). The EAC drawing has categorized some areas within Unit 215 as unclassified.
3. Marathon failed to document the correct electrical classification for areas in Unit 12 EAC11E0041D. The drawing does not accurately reflect/depict the appropriate electrical classification based on hazards of the process and the hazardous chemicals present (hydrogen, methane, ethane, propane, butane and pentane).
 - a. There is no legend for Class 1 Division 1 areas.
 - b. Note 4 areas are not depicted on the EAC drawing. Based on the Note 4 definition, Class 1 Division 1 areas do exist for this map: *"A Class 1 Division 1 area exists around each relief valve and tank vent that handles hazardous material. This area extends 5' in all directions from the vent or relief valve opening."*
 - c. The EAC drawing has categorized some areas within Unit 12 as unclassified.
4. Marathon failed to document the correct electrical classification for areas in Unit 27 EAC27E0123D. The drawing does not accurately reflect/depict the appropriate electrical classification based on hazards of the process and the hazardous chemicals present (propane, ethane, butane, isobutane, butene, propylene, pentane, isopentane, and isopentene).
 - a. There is no legend for Class 1 Division 1 areas.
 - b. Note 4 areas are not depicted on the EAC drawing. Based on note definition, Class 1 Division 1 areas do exist for this map: *"A Class 1 Division 1 area exists around each relief valve and tank vent that handles hazardous material. This area extends 5' in all directions from the vent or relief valve opening."*
 - c. The EAC drawing has categorized some areas within Unit 27 as unclassified.

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

The owner or operator shall document that equipment complies with recognized and generally accepted good engineering practices.

- 1) Marathon failed to document that 26 atmospheric pressure safety valves in Units 10, 63, and 66, 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. The facility has pressure safety valves (PSV) that would release flammable gases to the atmosphere, and in and throughout the facility, if activated, such as butane, propane, propylene, and liquid petroleum gases at pressures up to 250 PSIG.
- 2) Marathon failed to install Pressure Safety Valves in a vertical/upright position with their inlets below their springs in accordance with RSP-1131 and API 520 Part II section 13.1 The following PSV were installed in a horizontal position:
 - a. 12-PSV-6137-1 and 12-PSV-6137-2
 - b. 05-PSV-7037
 - c. 10-PSV-7008
 - d. 26-PSV-3611, 26-PSV-3643, 26-PSV-3647, 26-PSV-3648, 26-PSV-7016 (all in cooling water service)
- 3) Marathon failed to ensure that the nominal size of the nozzle is less than the relief valve inlet size in accordance with ASME Section VIII, Division 1, UG-135: *The opening through all pipe, fittings, and non-*

reclosing pressure relief devices (if installed) between a pressure vessel and its pressure relief valve shall have at least the area of the pressure relief valve inlet."

- a. Off Gas Dryer 26-1211-01/02 and 26-PSV-7011 and PSV-7012
 - b. cross-sectional area of 27-PSV-7025 inlet piping/fitting (1" SCH 160) is less than the area of 27-PSV-7025 inlet (1 ½" nominal size).
- 4) Marathon failed to ensure as per ASME Section I requirements: ASME Section I relief devices are required to provide protection for ASME Section I vessels.

10-PSV-6126 and 10-PSV-6130 are Teledyne-Farris 26JA11-130 conventional relief valves providing relief for Vacuum Heater Steam Drum 10-1225, an ASME Section I Coded vessel.

- 5) Marathon failed to ensure that the inlet pressure loss of 25-PSV-3031-1 thru 17 protecting the FCCU Main Fractionator 25-1101 are in accordance with Marathon's guideline RSP-1131-000 Rev.9, Section 6.2.2, evaluated based on Appendix B, Section B.1.7 Figure 6 (High Inlet Pressure Losses). The acceptable inlet pressure loss of the PSVs is less than 5% of the PSV set pressure. Since the inlet pressure drop at device capacity is greater than 5% of the PSV set pressure, the inlet pressure drop is not acceptable based on Marathon's risk criteria.

AOC 3 - 40 C.F.R. § 68.67(a) Process Hazard Analysis

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.

The PHA facility siting checklists are not appropriate for the complexity of the process in that they do not address the hazards identified in the ABS Consulting Facility Siting study.

AOC 4 - 40 C.F.R. § 68.67(c)(1) and (c)(5) Process Hazard Analysis

The process hazard analysis shall address: (1) The hazards of the process; including (2) the identification of any previous incident which had a likely potential for catastrophic consequences; and (5) stationary source siting.

1. Marathon has failed to address or mitigate the hazards of the process involving the flammable and toxic risks to occupied buildings and employees present inside and outside of buildings, as referred to in the ABS Consulting 2020 facility siting study.

In the ABS Consulting 2020 facility siting study, key elements of the study were to assess hazards to onsite personnel associated with operation of the plant and evaluate the resulting vulnerabilities for potential fire, toxic, and explosion hazards associated with the facility's operation. The report summarized maximum predicted consequences for onsite buildings for each release size category assessed.

- a. The explosion analysis indicates:
 - 26+ buildings are predicted to be vulnerable to permanent building structural damage.
 - 10 buildings are predicted to experience window damage.
 - 4 buildings are vulnerable to door damage.
 - 67 buildings and 26 Portable Blast Resistant Modules (PBRMs) will undergo internal debris damage.
 - 76 buildings may endure internal explosion damage.

b. The fire hazards (buildings for evacuation):

- 40 buildings and 23 PBRMs have Jet Fire Exposure.
- 24 buildings and 15 PBRMs have pool fire exposure.

c. The toxic hazard (buildings for evacuation):

- 50 buildings and 26 PBRMs should have respiratory protection appropriate for the hazard to use during evacuation.

2. Marathon failed to identify and address in the 2022, U215 Hydrocracker Unit Process Hazard Analysis, the February 21, 2022, incident which had a likely potential for catastrophic consequences.

3. Marathon failed to identify and address in the 2022 or 2023, U27 HF Alkylation-Hydrocracker Unit Process Hazard Analysis, the October 5th, 2022 incident, which had a likely potential for catastrophic consequences.

AOC 5 - 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.

1. Marathon failed to develop a mitigation plan based on the findings and recommendations of the facility siting study and as required (Section 5, Remediation) by the ABS Consulting Group. Marathon failed to document what actions were to be taken, prepare a written schedule of when these actions are to be completed; assure that the recommendations are resolved in a timely manner and that the actions are completed as soon as possible; and ensure the resolution is documented;
2. Marathon's established recommendation policy states "A recommendation can be modified when it can be documented in writing and based on adequate evidence. An approved form must be attached before changing status." PHA recommendations that have been modified or changed that do not have an approved recommendation modification form per Marathon's recommendation policy are as follows:
 - Unit 215: Recommendation Numbers 130623, 280816, and 280828.
 - Unit 20 and Unit 21: Recommendation Numbers 242268 and 242275.
 - Units 16, 17, 25, 16, & 30 FCCU (CAT): Recommendation Number 27389.
 - GCL-29-General Operations: Recommendation Number 150586.

3. Unit 27-2023 PHA #4 Recommendation Number 274978.

Mitigate the risk of the hydrocarbon volume in 27-1206 Splitter accumulator feeding a fire (pump seal) at the Splitter Reflux pump.

Comment: "Follow up - 2022 - Current safeguards flow deviation alarm & dual tandem seals. EIV driven by "large volume" & borderline "12" evaluation. This was originally found in 2017 but recommendation was rejected stating alternate means protected **but 2022 team could not find the alternate means**. EIV determined not required by technologist at the time but change in guard has different opinion.

2022 PHA team was ok with not doing EIV but wanted to see something done. E&I investigated a lot and ultimately put in PRF for EIV - why not on other pumps? Size!" **Due date 12/15/2028; status is open.**

Hazard has gone unabated for since 2017.

AOC 6 - 40 C.F.R. § 68.69(a)(1)(vii) Operating Procedures

The owner or operator shall develop and implement written operating procedures that provide clear instructions for safely conducting activities involved in each covered process consistent with the process safety information and shall address (vii) startup following a turnaround, or after an emergency shutdown.

Marathon failed to develop written operating procedures that provided clear instruction for safely conducting startup activities following a turnaround in Unit 215. Marathon failed to ensure that the operating procedure included the steps to close the valve that isolates the low-pressure line from the high-pressure equipment.

AOC 7 - 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.

Marathon failed to ensure that the Unit 215 operating procedures were reviewed as often as necessary to assure that they reflect current operating practice. The operating procedures were incorrectly certified as being accurate in 2020, 2021, and 2022. When the Unit 215 startup procedure was modified in 2020, to include the "huff and puff" section, the update unintentionally removed steps to close the valve from the high-pressure line to the low-pressure line and Startup Ejector.

AOC 8 - 40 C.F.R. § 68.69(d) Operating Procedures

The owner or operator shall develop and implement safe work practices to provide for the control of hazards during operations such as lockout/tagout; confined space entry; opening process equipment or piping; and control over entrance into a stationary source by maintenance, contractor, laboratory, or other support personnel. These safe work practices shall apply to employees and contractor employees.

Marathon failed to develop and implement safe work practices to control hazards during the opening of process piping, pump (1509-2), and an emergency isolation valve (HV-4137). In the process of attempting to drain the pump and close the emergency isolation valve, a release of flammable hydrocarbons occurred, producing a vapor cloud, which ignited resulting in an explosion and fire. Marathon placed a diesel-powered light tower, which was unclassified electrical equipment, in a Class 1 Division 2 area. The flammable vapors released to the ambient environment were ignited by the diesel-powered light tower.

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 ongoing integrity of process equipment.

1. Marathon failed to establish a written procedure that addresses the identification and replacement of outdated or potentially defective flange gaskets in the Hydrogen Fluoride (HF) Alkylation Unit 27, that have been in place for 25-45 years. Inspection and testing of gaskets in HF service is necessary to maintain the on-going integrity of process equipment to ensure that they have not become degraded or brittle, or in such a condition that makes them susceptible to hydrogen embrittlement cracking or stress corrosion cracking.

2. Marathon failed to include previous ultrasonic testing results in the Inspection and Test Plan for piping circuits: 27-14100, 27-0420, 27-01020, and 27-00807.

AOC 10 - 40 C.F.R § 68.73(d)(1) Mechanical Integrity

Inspection and testing. Inspections and tests shall be performed on process equipment.

Marathon failed to ensure that 14 instrument components identified as an independent protection layer, were included in the mechanical integrity inspection and testing program. Marathon failed to ensure that inspection and testing was performed on the following instruments.

- | | |
|---------------|---------------|
| • 66-PAH-0112 | • 50-AT-6074, |
| • 66-TT-6448 | • 71-PT-6113 |
| • 50-AT-6025 | • 71-PT-6114 |
| • 50-AT-6030 | • 50-PT-6162 |
| • 50-AT-6042 | • 50-PT-6163 |
| • 50-AT-6047 | • 50-PT-6164 |
| • 50-AT-6069 | • 50-PT-6165 |

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

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

1. Marathon failed to perform external and/or NDE/UT inspections every 5 years for Class 1 piping in accordance with API 570 Section 6.3.3 for the following piping circuits:
 - a. 2"-CH2F-27-171 no ultrasonic testing has been performed.
 - b. 3"-CH2F-27-213 (C#27-1080) no external inspection/corrosion under insulation (CUI) were performed.
 - c. 4"-C2-27-847-lh no ultrasonic testing data has been performed.
 - d. 4"-CH2F—27-155 (MA) no external inspection/CUI inspections have been performed.
 - e. 4"-CH2F—27-191 no external inspection/CUI inspections have been performed.
 - f. 8"-CH2F-27-188 no external inspection/CUI inspections have been performed.

- g. 10"-C2-27-217 No ultrasonic data/NDE testing has been performed.
- h. 12"-A2-27-253 No ultrasonic data/NDE testing has been performed.
- i. 12"-CH2F-27-1401 (MA) no external inspection/CUI inspections were performed prior to May 2021 (May 2020-May 2021) and no ultrasonic data/NDE testing has been performed.
- j. piping circuit 14100 no UT inspections on pipe fitting and nipples CMLs 1-47.

2. Marathon failed to perform external inspections every 5 years in accordance with API 510 Section 6.4 and Section 6.5 for the following pressure vessels:

- a. 215-1102 Fractionator external inspection was previously performed in 1/2017 and was due 1/2022. No external inspection was performed between 2/2022-2/2024.
- b. 12-302 Intermittent Blowdown Drum external inspection was previously performed in 10/2013 and was due 10/2018. No external inspection was performed between 5/2013 to 3/14/2023. No external inspection was performed between 10/2018-8/2023.

3. Marathon failed to ensure that pressure safety valves were inspected and tested every five years in accordance with recognized and generally accepted good engineering practices such as API 510, Section 6.6.3.2.

Pressure safety valves PSV-4007, PSV-4045, PSV-4050, PSV-4052, PSV-4054, and PSV-4072 were being inspected at 6 year intervals between 2016 and 2022.

4. Marathon failed to ensure that storage tank 150-11 was inspected monthly in accordance with API 653, Section 6.3, which requires routine In-service Inspections:

6.3.1.1 The external condition of the tank shall be monitored by close visual inspection from the ground on a routine basis.

6.3.1.2 The interval of such inspections shall be consistent with conditions at the particular site, but shall not exceed one month.

6.3.1.3 This routine in-service inspection shall include a visual inspection of the tank's exterior surfaces. Evidence of leaks; shell distortions; signs of settlement; corrosion; and condition of the foundation, paint coatings, insulation systems, and appurtenances should be documented for follow-up action by an authorized inspector.

5. Marathon failed to perform the following tasks as recommended in the 2011 internal inspection:

A complete visual inspection of the tank bottom was not performed due to the coating. i.

a visual inspection should be performed if the bottom coating is removed.

ii. the bottom should be re-inspected for soil side corrosion if the bottom coating is removed. iii.

the gauge pole supports should have pad plates sealed to the internal shell.

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.

Marathon failed to correct deficiencies in the following equipment that were outside acceptable limits before further use or in a safe and timely manner.

1. Marathon did not correct deficiencies where fireproofing was partially or completely removed on motor operated emergency isolation valves located at the bottom of spheres 10-1, 25-3, 25-5, 26-6, and 25-7. A work order to repair the fireproofing was initiated in March 2020; hence, the fireproofing was deficient between March 2020-June 2021.
2. Marathon did not ensure that the correct category relief valve was being used. The "H" Milton Roy "H" series safety valves are designed to discharge to an atmospheric system and currently relieve to the caustic header with constant backpressure.
3. 126-PSV-7104 and 126-PSV-7105 on the Caustic Injection Pump 126-1507-01/02 relieve to the caustic header with constant backpressure of 48 PSIG.
4. Marathon did not ensure that 233-PSV-7050 (3K4, bellows relief valve set at 50 PSIG) protecting the 233-1201 Sour Water Flash Drum will provide adequate relief capacity for 20 identified relief scenarios.
5. Marathon did not ensure that 07-PSV-7029, conventional type relief valve, will open at a pressure that is below the equipment MAWP in overpressure scenarios. The current 07-PSV-7029 Cold Differential Test Pressure (CDTP) is set at 750 PSIG which doesn't offset the relief valve backpressure at service condition.
6. Marathon did not ensure that the shell side of DAO/Rich Solvent Exchanger 07-1303-01/02 (shell, MAWP 515 PSIG) and DAO Stripper Heater 07-1306-01/02 (shell, MAWP 253 PSIG) are protected from overpressure in the event of an external fire. There is no relief device present.
7. Marathon did not ensure that the shell side of Asphaltene Stripper Heater 07-1312-01/02 and Asphaltene/Asphaltene Separator Bottoms Exchanger 07-1310 (S) are protected from overpressure in the event of an external fire. There is no relief device present.
8. Marathon did not ensure that 43-PSV-1240 will provide adequate relief capacity for the closed outlet scenario due to continued heat input and vaporization of C3 from 50 PSIG steam on the vaporizer tubeside. The required API orifice area is 3.57 in². The installed API orifice area is 0.110 in². Accumulated pressure is expected to be between 250% and 350% of equipment MAWP. The critical pressure is reached around 230% of MAWP, so the relief load is expected to be supercritical.
9. Marathon did not ensure that deficiencies identified in the 24" suction emergency isolation valve (EIV), HV4137 used to isolate Pump 1509-2 were corrected before further use or in a safe and timely manner when necessary means are taken to assure safe operation. Emergency Isolation Valve, HV-4137 had a history of only partially closing and not initially sealing closed. The failure of the valve to close properly resulted in a leak of flammable hydrocarbons, a vapor cloud developed which was then ignited.
10. Marathon failed to correct deficiencies in the Alkylation Fractionator ¾" Reboiler Pump drain line that were outside acceptable limits before further use or in a safe and timely manner when necessary means are taken to assure safe operation. Marathon failed to implement measures to address plugging of the Alkylation Fractionator ¾" Reboiler Pump drain line to prevent iron fluoride plugging and the collection of flammable hydrocarbon liquid inside the drain line.

AOC 13 - 40 C.F.R. § 68.73(f)(3) Mechanical Integrity

The owner or operator shall assure that maintenance materials, spare parts and equipment are suitable for the process application for which they will be used.

1. Marathon's failed to implement its Positive Material Identification program (QA/QC Procedure Document # RMP-3025-GV, Revision 5) in that alloy components did not undergo positive material identification analysis as required by Marathon. Fifteen (15) components were identified as lacking PMI analysis/determination in the 2021 compliance audit and 649 were identified as lacking PMI analysis/determination in a subsequent survey between April 2019- July 2021, and at times prior to.
2. Marathon failed to implement its Positive Material Identification program in that alloy weld consumables did not undergo positive material identification analysis as required by corporate procedure Positive Material Identification (PMI) of New and Existing Process Piping Systems (Document #SP-90-20, Revision 12) Section 6.5.

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

The owner or operator shall establish and implement written procedures to manage changes (except for "replacements in kind") to process chemicals, technology, equipment, and procedures; and, changes to stationary sources that affect a covered process.

Marathon failed to implement a management of change to address a material change and installation of updated flange gaskets which were not susceptible to thermal oxidation.

The September 24, 2022 incident which occurred in Unit 12, Platformer Heater identified a 27+ years-old failed flange gasket as the source of the release of hydrogen and benzene. The resolution selected by Marathon was a material change to new updated gaskets to replace any reactor circuit gaskets in U12 and U212 that may be susceptible to thermal oxidation.

AOC 15 – 40 C.F.R. § 68.75 Management of Change

68.75(b)(3) The procedures shall assure that modifications to operating procedures are considered prior to any change and;

68.75(e) 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.

Marathon failed to implement the management of change process when in 2020 a startup operating procedure was modified to include a "huff and puff section". The modification of the procedure removed steps to close the valve from the high-pressure line to the low-pressure line and Startup Ejector. The vacuum steps were replaced to avoid potential air ingress to the reactor system.

AOC 16 - 40 C.F.R. §68.79(c) Compliance Audits

A report of the findings of the audit shall be developed.

1. Marathon failed to identify as a finding in the 2021 compliance audit; an observation stating that “the capability of the fixed firewater system, most recently evaluated in a 2019 hydraulic study, noted a deficiency of firewater system pressure in certain tank farm areas. This audit team also noted annual performance tests of the nine fixed firewater pumps typically showed four pumps failing the tests. These failures were typically a result of the pumps marginally not producing the needed pressure at high flow rates.” The observation addresses deficient fire protection equipment which would require a finding, an appropriate recommendation, and documentation that the deficiency has been corrected.
2. Marathon failed to identify as a finding in the 2021 compliance audit; an observation stating that “a recent internal audit determined that many post-startup Management of Change (MOC) action items involving PSI updates had been going past the one-year due date specified by the refinery’s procedures.” The observation addresses deficient management of change procedures which would require a finding, an appropriate recommendation, and documentation that the deficiency has been corrected.

AOC 17 - 40 C.F.R. §68.79(d) Compliance Audits

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.

Marathon failed to promptly determine an appropriate response to a compliance audit finding addressing that no Positive Material Identification (PMI) was being performed on alloy weld consumables prior to fabrication as required by corporate procedure Positive Material Identification (PMI) of New and Existing Process Piping Systems (Doc. No. SP-90-20, Rev. 12) §6.5. The 2023 compliance audit was completed in November 2023. As of the date of this inspection, March 25-29, 2024, no process had been developed and implemented to ensure that PMI was being performed on alloy weld consumables in accordance with the corporate procedure. The target date for completion is January 2025.

AOC 18 - 40 C.F.R. § 68.81(e) Incident Investigations

The owner or operator shall establish a system to promptly address and resolve the incident report findings and recommendations. Resolutions and corrective actions shall be documented.

Marathon failed to establish a system to promptly address and resolve the report findings and recommendations associated with the flange gasket failure on September 24, 2022, in the Unit 12 Reactor Structure fire (incident #350697). Recommendation number 288315 to “identify and replace any reactor circuit gaskets in U12 and U212 that may be susceptible to thermal oxidation during the 4Q23 turnaround.” At the time of this inspection Marathon had not identified or replaced any reactor circuit gaskets and postponed the target date until October 31, 2025.

AOC 19 - 40 C.F.R. § 68.85(a)/68.85(b) Hot Work Permits

- (a) ***The owner or operator shall issue a hot work permit for hot work operations conducted on or near a covered process.***
- (b) ***The permit shall document that the fire prevention and protection requirements in 29 CFR 1910.252(a) have been implemented prior to beginning the hot work operations; it shall indicate the date(s) authorized for hot work; and identify the object on which hot work is to be performed. The permit shall be kept on file until completion of the hot work operations.***

Marathon failed to document that the hot work permit provisions identified in the Marathon permit form were completed and were in compliance with the requirements of 1910.252(b).

1. The following Marathon hot work permits were not properly completed as there was no fire watch signature, and no fire watch time In/Out:
 - Permits with Grinding/impact chipping -65114, 65117, 65121, 65103, 65107, 65195, 65185, 65189.
 - Permits with Welding - 65116.
 - Permits with Grinding/impact chipping/welding/use of open flame - 18677.
2. The following Marathon hot work permits were not properly signed by the contractor representative as completed:
 - 82419
 - 83373
3. The following Marathon hot work permits required a fire watch, but this information was not properly documented on the "tan" copy as mandated by the Marathon Hot Work Policy:
 - 83364 • 83373

AOC 20 – CAA §112(r)(1) – The CAA General Duty Clause

Prevention of Accidental Releases (1) Purpose and General Duty - It shall be the objective of the regulations and programs authorized under this subsection to prevent the accidental release and to minimize the consequences of any such release of any substance listed pursuant to paragraph (3) or any other extremely hazardous substance. The owners and operators of stationary sources producing, processing, handling or storing such substances have a general duty, in the same manner and to the same extent as section 654, title 29 of the United States Code, to identify hazards which may result from such releases using appropriate hazard assessment techniques, to design and maintain a safe facility taking such steps as are necessary to prevent releases, and to minimize the consequences of accidental releases which do occur.

1. At the time of the incident, the Fractionator and the Reboiler Pumps were being isolated and de-inventoried for blinding. Three reboiler pumps were isolated and being drained in preparation for blinding. One of the reboiler pumps, Pump 27-1509-02, was found to have the drain lines plugged. Hence, in the process of attempting to drain the pump, a release of flammable hydrocarbons occurred, subsequently igniting a vapor cloud, causing an explosion and fire which injured two workers. One of the injuries required evacuation by helicopter to a medical facility.

Marathon failed to design a safe facility by not taking such steps as are necessary as follows:

- a. failure to implement a solution to frequent plugging in the ¾" Reboiler Pump drain lines over a period of years.
- b. failure to drain hydrocarbon fluid to a closed system rather than an open process sewer.
- c. failure to inform operators of the known potential fire and explosion hazards related to the work process.
- d. failure to train operators to understand that when these pumps drain hydrocarbon to the sewer, the alarm of hydrocarbon detectors in the area above the LEL is not normal, represents a significant hazard and potential for explosion.
- e. failure to categorize areas of the facility as Class 1 Division 2.

2. Storage tank 150-11, containing naphtha, developed a leak at the tank floor. Naphtha leaked outside of the tank, on to the ground surrounded the tank and then seeped beneath the ground. Naphtha continued to pool around the storage tank and eventually found an ignition source. Speculation is that the ignition source was a live electrical wire located beneath the ground.

- a. failure to properly inspect storage tank 150-11 to identify hazards using appropriate hazard assessment techniques.
- b. failure to maintain a safe facility by not taking steps as were necessary, such as repairing cracks in the floor of storage tank 150-11, to prevent the release of naphtha.
- c. failure to minimize the consequences of accidental releases which do occur by assuring that ignition sources were not present adjacent to storage tank 150-11.

Section IV - FOLLOW UP

Additional information may be requested where the inspector has determined that there is additional information necessary, missing information, or documents that require clarification.

Section V - LIST OF APPENDICES

Not applicable