UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 5
77 WEST JACKSON BOULEVARD
CHICAGO, ILLINOIS 60604

DATE:	***September 27, 2021***
SUBJECT:	CLEAN AIR ACT INSPECTION REPORT Marathon Petroleum Company Detroit Refinery, Detroit, Michigan
FROM:	Veronica Fischer, Environmental Engineer AECAB (MI/WI)
THRU:	Sarah Marshall, Section Chief AECAB (MI/WI)
TO:	File

BASIC INFORMATION

Facility Name: Marathon Petroleum Company Detroit Refinery

Facility Location: 1300 South Fort Street, Detroit, Michigan 48217

Date of Inspection: July 26, 2021 – July 30, 2021

EPA Inspector(s):
1. Veronica Fischer, Environmental Engineer, Region 5
2. Constantinos Loukeris, Environmental Engineer, Region 5
3. Brittany Cobb, Environmental Engineer, Region 5
4. Craig Haas, Sr. Environmental Scientist, OECA, HQ

Other Attendees:
1. Anthony Gaglione, Eastern Research Group (ERG), Inspector
2. Dan Roper, Eastern Research Group (ERG), Inspector
3. Dave Leaver, Marathon Petroleum Company, Refining General Manager
4. Janine Bertucci, Marathon Petroleum Company, PSM Coordinator
5. Honor Sheard, Marathon Petroleum Company, Health, Environmental Safety & Security Manager
6. Rodney Reibold, Marathon Petroleum Company, Refining Process Safety and Risk Manager
7. Eric Bohnert, Marathon Petroleum Company, Technical Services Manager
8. Anne Bertelsmann, Marathon Petroleum Company, PHA SME

9. Leatha Hallmark, Marathon Petroleum Company, Operations Manager
10. Mason Thomas, Marathon Petroleum Company, Refining Reliability Specialist
11. Terry Geisler, Marathon Petroleum Company, Engineering Supervisor
12. Steve Kruszewski, Marathon Petroleum Company, Project Engineering Manager
13. Tyler Veenstra, Marathon Petroleum Company, Training & Development Manager
14. Brian Hunter, Marathon Petroleum Company, Fire Chief
15. Al Morales, Marathon Petroleum Company, Safety Supervisor

Contact Email Address: Jbertucci@marathonpetroleum.com

Purpose of Inspection: Risk Management Plan (RMP) Program Level 3 Processes Inspection

Facility Type: Petroleum Refinery – FCCU, NHT, Gas Concentration

Regulations Central to Inspection: RMP Program under Section 112r of the Clean Air Act

Arrival Time: July 26, 2021 at 12:45 PM EST
Departure Time: July 30, 2021 at 11:00 AM EST

Inspection Type:
☐ Unannounced Inspection
☒ Announced Inspection

OPENING CONFERENCE

☒ Presented Credentials
☒ Stated authority and purpose of inspection
☐ Provided Small Business Resource Information Sheet
☒ Small Business Resource Information Sheet not provided.
☒ Provided CBI warning to facility

The following information was obtained verbally from the facility personnel unless otherwise noted.

The facility inspection was conducted by EPA inspectors and Eastern Research Group inspectors.

Process Description:

Fluidized Catalytic Cracking Unit (FCCU)
The FCCU converts high molecular weight fractions of hydrocarbons into gasoline, olefins, and other low molecular weight gases utilizing a solid powder catalyst. In the side-by-side FCC, the catalyst is sent through the catalyst riser, where steam is used to fluidize the catalyst powder. The FCC feed is also sent through the catalyst riser where it is vaporized and cracked as it reacts with the catalyst. The hydrocarbon vapors are separated from the spent catalyst in the reactor using cyclones. The catalyst then drops down through a stripping section to remove any hydrocarbon vapor from the catalyst

before it enters the regenerator. The catalyst is sent to the regenerator through a spent catalyst slide valve (SCSV). A catalyst barrier is maintained, however the facility stated that it does not rely on the slide valve and catalyst barrier to maintain the pressure differential. The facility uses steam on the reactor side to maintain the pressure barrier. The accumulation of sour water in the overhead receiver is monitored to ensure that there is forward steam flow and that there is enough steam to maintain the pressure barrier. In the regenerator, coke is burned off the catalyst surface. Catalyst is removed from the regenerator flue gas using an electrostatic precipitator (ESP). The ESP is not energized unless the FCCU is under normal operation.

The reactor was new to the facility in 2018. The designer and licensor provide technical support for the reactor to the facility.

Gas Concentration Unit
The Gas Con combines main column overhead vapors from the FCCU with other hydrocarbon liquids and vapors from various process units to produce gasoline and liquified petroleum gas (LPG). The compressor section uses one wet gas compressor to increase the pressure of the feed. The absorber section has a primary and secondary absorber and is used to increase the production of LPG and gasoline by recovering heavier hydrocarbon vapor. The primary absorber receives naptha and vapor from the high pressure receiver to create lean oil and rich oil streams. The lean oil stream is then sent to the secondary absorber that receives light cycle oil (LCO) and creates rich LCO and an off-gas stream that is sent to a fuel absorber. The distillation section consists of a cat gasoline stripper, a debutanizer, a depropanizer, and a C3/C4 splitter.

Naptha Hydrotreating Unit (NHT)
Naptha charge and hydrogen are heated and sent to reactor which contains a catalyst. The high temperature naptha reacts with the hydrogen to remove sulfur from the naptha feed. The reactor effluent is sent through a separator and then to a stripper to remove H2S from the stream. The stripper bottoms are then sent to a heavy naptha splitter to separate the light and heavy naptha. A depentanizer is used seasonally to remove pentane from the light naptha.

TOUR INFORMATION

EPA Tour of the Facility: Yes

EPA and ERG inspectors toured the FCCU, Gas Con, and NHT and compared field equipment to the facility's current P&IDs.

EPA reviewed documents for the following RMP elements for this site that are listed in EPA's Program Level 3 Process Checklist:

1. Applicability;
2. Management;
3. Off-site consequence analysis;
4. Worst-case release scenario analysis;
5. Alternative release scenario analysis;
6. Hazard Assessment Documentation:
7. Five-year accident history;

8. Process Safety Information (PSI);
9. Process Hazard Analysis (PHA);
10. Mechanical Integrity (MI);
11. Operating Procedures (SOP);
12. Training;
13. Management of Change;
14. Pre-startup safety review;
15. Compliance Audits;
16. Incident Investigation (II);
17. Employee Participation;
18. Hot Work Permit;
19. Contractors;
20. Emergency Response; and
21. Risk Management Plan;

Applicability
EPA inquired about the applicability of RMP requirements to the refinery's flare system. The refinery has four flares. All flares, except for the coker flare, are located outside of battery limits of their respective process units. The coker flare is located inside of battery limits of the Coker Unit. ERG is investigating RMP applicability for each of the flares.

Process Safety Information
EPA and ERG inspectors field verified P&IDs for the three process units listed above. In the FCCU, a temporary line was installed that did not appear on the P&ID. There were also multiple local pressure gauges that were not able be read due to damage from heat. In the NHT, there were two chain locked open (CLO) designated valves that were missing chain locks. EPA requested multiple documents related to the facility's PSI (see Appendix B).

Process Hazard Analysis

EPA inspectors reviewed the PHAs for the FCCU and NHT on-site. The 2019 FCCU PHA had multiple open recommendations. Many of the PHA recommendations were marked as due several years following the completion of the PHA and close to the date of the next 5 year PHA cycle. Due dates for PHA recommendations are initially set by the PHA team by determining if a unit shutdown is required. If a shutdown is determined to be required by the PHA team, then the due date is set for the next known shutdown date of the unit. The PHA recommendations are then reviewed by the facility's technical services group. It is unclear at what point in the review process the due date and necessity of shutdown is evaluated by technical services and whether technical services will change the due date if a shutdown is not required. EPA selected four open PHA recommendations for further review. For one of the four open recommendations, necessity of shutdown had not yet been determined at the time of the inspection. When EPA inquired about interim measures used to mitigate the hazards associated with open PHA recommendations, the facility stated that only "C" risk and above required interim measures to be implemented.

Mechanical Integrity

Mechanical integrity standards and practices specific to the facility were reviewed on-site and requested for further review following the inspection. Risk-based inspection is used for fixed equipment, and time- or condition-based inspection is used for all other equipment. EPA and ERG inspectors requested risk-based inspection analyses for selected pressure vessels.

EPA inspectors requested information about the recognized and generally accepted good engineering practices (RAGAGEP) being used by the facility to select and maintain valves. The facility's documentation states that API STD 602, API STD 622, and API STD 624. The facility required implementation of API STD 622 and API STD 624 in 2018.

Operating Procedures

EPA and ERG inspectors requested selected operating procedures for further review following the on-site inspection.

Training
The facility requires one month of standard training for all employees, followed by eight weeks of training for a specific job. Operators are usually trained for four jobs which requires six to eight months of training. ERG inspectors requested training records for further review.

Management of Change (MOC) and Pre-startup Safety Review
All MOCs include a safety and health review. A checklist is used to determine whether an MOC requires a PHA to be performed. A temporary MOC may be performed for temporary installation of piping and equipment. Procedural MOCs are used for routine changes such as changes to operating procedures. Pre-startup safety reviews require six people to review and sign-off before the process can be started.

Compliance Audits
EPA and ERG inspectors requested the previous two compliance audits for each of the three processes that were inspected for further review following the on-site inspection.

Incident Investigation
EPA and ERG inspectors requested all incident investigation reports for the five years prior to the inspection. EPA inquired about the February 2019 incident involving a malfunction of the coker flare. ERG is investigating the applicability of RMP requirements to the refinery's flare system.

Hot Work Permit
EPA inspectors reviewed selected hot work permits. In some permits, EPA noted that the time that the firewatch left was before the time of work completed. The facility stated that sometimes maintenance staff or contractors will have to complete additional work following the hot work and therefore the work completed time may not be reflective of the time that actual hot work was performed. The facility stated that the firewatch is there for the duration of the hot work and for 30 minutes following the completion of the hot work.

Photos and/or Videos: were taken during the inspection.

Photos were taken by Marathon personnel using safe camera equipment and provided to EPA following the facility tour.

CLOSING CONFERENCE

☒ Provided U.S. EPA point of contact to the facility

Requested documents:
See Appendix B.

Concerns:

EPA discussed the following concerns with the facility personnel.

Process Safety Information
EPA inspectors noted discrepancies between field equipment and P&IDs in the FCCU and NHT.

Process Hazard Analysis
EPA inspectors noted that there is no standard way of creating timeline for implementing PHA recommendations. EPA inspectors noted concern about making the due date for almost all PHA recommendations several years following the PHA without implementing interim measures to mitigate the associated hazards.

Mechanical Integrity
EPA inspectors noted that the facility's RAGAGEP for valves is API STD 602, however the facility's approved manufacturers list did not include API STD 602 compliant valves.

Hot Work
EPA inspectors recommended that the hot work permit include the time that the hot work was finished in addition to the time the permit ended.

DIGITAL SIGNATURES

Report Author: Veronica Fischer
Digitally signed by Veronica Fischer
Date: 2021.09.27 11:39:40 -05'00'

Section Chief: SARAH MARSHALL
Digitally signed by SARAH MARSHALL
Date: 2021.09.27 11:35:19 -05'00'

Facility Name: Marathon Petroleum Company Detroit Refinery
Facility Location: 1300 South Fort Street, Detroit, Michigan 48217
Date of Inspection: July 26, 2021 - July 30, 2021

APPENDICES AND ATTACHMENTS

1. Appendix A – Photo Log (CBI) – Pending Upload from Marathon
2. Appendix B – List of Documents Requested (CBI)