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1.0 PURPOSE

1.1 The purpose of this plan is to establish guidelines to ensure that employee occupational exposure to benzene is evaluated and controlled to minimize the risk of injury or illness.

2.0 APPLICATION

2.1 This plan applies to all MPC employees and contractors working at the LRD Refinery that may potentially be exposed to benzene.

3.0 IMPLEMENTATION

3.1 The implementation of the requirements outlined in the Benzene Compliance Plan shall be adhered to on this standard's effective date.

4.0 RESPONSIBILITIES

4.1 The Manager of Environmental, Safety and Security

4.1.1 Oversee the requirements and implementation of the LRD Benzene Compliance Plan.

4.2 The Safety Department

4.2.1 Maintain, audit and revise the LRD Benzene Compliance Plan.

4.2.2 Review the LRD Benzene Compliance Plan on a 3 year basis and make revisions in accordance with regulatory requirements, MPC policies, and current operating conditions.

4.2.3 Identify engineering and work practice controls to minimize occupational exposure to benzene.

4.2.4 Develop and implement an exposure monitoring program in accordance with the guidelines established within this plan that identifies areas and job classifications where benzene levels exceed established occupational exposure limits.

4.2.5 Establish perimeters of benzene regulated areas through monitoring and sampling.

4.2.6 Conduct periodic sampling where benzene levels exceed the action level or permissible exposure limit until monitoring justifies otherwise.

4.2.7 Provide written notification of the monitoring results to employees.

4.2.8 Oversee the maintenance of respiratory protection.

4.3 Refinery Management

4.3.1 Administration and enforcement of the provisions and guidelines defined in the LRD Benzene Compliance Plan.

4.3.2 Ensure employees adhere to all policies and procedures implemented to minimize exposure to benzene.

4.4 Area Supervisors

4.4.1 Ensure employees properly use appropriate personal protective equipment.

4.4.2 Ensure equipment containing benzene is properly labeled.

4.4.3 Ensure benzene regulated areas are properly marked and labeled.

4.5 Refinery Employees

4.5.1 Follow proper work instructions and procedures to minimize benzene exposure.

4.5.2 Use appropriate personal protective equipment selected to protect against benzene exposure.

5.0 DEFINITIONS

5.1 ***Action Level (AL):*** An eight-hour time weighted average (TWA) airborne benzene exposure level of 0.5 parts per million (ppm), which requires specific actions outlined by OSHA.

5.2 ***Benzene Covered Employee:*** An employee included in the benzene exposure control program due to potential exposure above the AL for 30 days or more per calendar year.

5.3 ***Permissible Exposure Limit (PEL):*** An eight-hour time weighted average airborne benzene exposure of 1.0 ppm.

5.4 ***Short-term Exposure Limit (STEL):*** A fifteen-minute time weighted average airborne benzene exposure level of 5.0 ppm.

5.5 ***Regulated Area:*** An area where airborne concentrations of benzene exceed or may reasonably be expected to exceed either exposure limit or the action level. Task based and temporary regulated areas may be established and barricaded for anticipated exposures above 0.5ppm. Access to regulated areas is limited to authorized personnel only.

6.0 REQUIREMENTS

6.1 Concentration Determination.

6.1.1 All refinery streams are analyzed for benzene content. Vessels and equipment containing greater than 0.1 percent benzene are labeled in accordance with 29 CFR 1910.1200 and 29 CFR 1900.1028.

6.1.1.1 Unit RMPs are used to identify vessels and equipment containing greater than 0.1 percent volume of benzene. The list of identified equipment is found in Appendix 10.1.

6.1.2 The responsibility for preliminary assessment of work area atmospheres is primarily that of the Operating Department with assistance of Lab, Tech Services and Safety.

6.1.3 Benzene Detector Tubes, PID monitor (UltraRAE), a portable gas chromatograph or equivalent can be used to determine atmospheric concentrations.

6.1.4 Safety department personnel are responsible for assessment required to determine airborne concentrations of benzene in regulated confined spaces or other work areas, prior to entry by LRD or contractor personnel. This assessment shall be accomplished through the use of an organic vapor monitor equipped with a photo ionization detector (PID) and/or a portable GC-PID.

6.2 Exposure Monitoring

6.2.1 Evaluations of potential exposures may be conducted quantitatively and analyzed to ensure statistical validity per the Marathon Exposure Assessment Methodology (EXAM) as described in the LRD Industrial Hygiene Standard Practice, RSW-0118-GV.

6.2.2 The MPC Industrial Hygienist will oversee area and breathing zone sampling of MPC and contractor personnel to determine benzene exposures.

6.2.3 Air sampling conducted to assess full-shift exposure to airborne benzene will normally be done with the 3M 3520 Film Badge and/or charcoal tube and air sampling pumps.

6.2.4 Air sampling and monitoring conducted to assess short-term exposure to airborne benzene will be done with charcoal tube and air sampling pumps or a tedlar bag.

6.2.5 Air sample results from the analysis of 3M Film Badges or charcoal tubes are provided by MPC Occupational Environmental and Hygiene and will be forwarded to the individual monitored, and other appropriate personnel within 15 days of receiving the results. Short-term samples collected in a tedlar bag are analyzed at the time of sampling, using a RAE Systems UltraRAE or Portable GC and reported immediately.

6.2.6 Data will provide an indication of the need for investigation of procedures, engineering controls, and emission sources. Follow-up monitoring must be conducted every six months for results above the TWA of 1 ppm and every year for results over the 0.5 ppm Action Level. This monitoring may be discontinued when at least two consecutive measurements >7 days apart are below the Action Level.

6.3 Covered Employees

6.3.1 Employees shall be considered “Covered Employees” if they are exposed to benzene at/or above the action level 30 or more days per year or at/or above the PEL for 10 or more days per year.

6.3.2 A list of the employees covered by this program shall be maintained by the Safety Department as determined by industrial hygiene monitoring.

6.3.3 New or transferred employees are added to this list when they are placed in job assignments that have been identified as having confirmed exposures.

6.3.4 Employees are removed from the list when their employment terminates or they are transferred to another job assignment where there is no potential benzene exposure above the action level.

6.3.5 No LRD personnel are currently considered covered employees since personal monitoring for benzene has indicated no benzene exposures in excess of the Action Level.

6.4 Regulated Areas

6.4.1 Operating personnel will ensure that proper signs/labeling and barricades, as necessary, are placed at all entrance ways of regulated areas, including temporary regulated areas.

6.4.2 Only confined spaces in service and temporary tasks are identified as benzene regulated areas. Other than confined spaces, there are no LRD exposures above regulated TWAs.

6.4.3 Hygiene facilities and practices must be provided and implemented when exposure exceeds regulatory limits.

6.4.4 Regulated Confined Space Entry

6.4.4.1 The Confined Space and Work Permit Standards will be followed for all confined space entry.

6.4.4.2 Chemical cleaning, water washing, steaming, and forced ventilation will help to reduce airborne benzene concentrations below 0.5 ppm.

6.4.4.3 All initial entry, blinding, etc. in suspected benzene areas will require the proper personal protective equipment until the airborne benzene concentration is proven to be less than 0.5 ppm.

6.5 Marking/Labeling

6.5.1 Perimeters of all temporarily regulated areas designated as such during maintenance operations, etc., will be marked with red barrier tape and signs labeled as follows:

DANGER
CONTAINS BENZENE
CANCER HAZARD
FLAMMABLE - NO SMOKING
AUTHORIZED PERSONNEL ONLY
RESPIRATOR REQUIRED

6.5.2 Airborne benzene concentrations detected in temporarily controlled areas and appropriate PPE required by personnel working in these areas will be indicated on the corresponding work permit by Operations, Product Control and/or Safety.

6.5.3 Temporary regulated areas will be dismantled and signs removed once airborne benzene concentrations decrease and remain at levels below 0.5 ppm as determined by the Safety Department.

6.5.4 Vessels that contain concentrations of benzene in excess of 0.1% benzene are labeled in accordance with 29 CFR 1910.1200 as follows:

DANGER
CONTAINS BENZENE
CANCER HAZARD

6.5.4.1 These vessels are not considered regulated areas; however, may become one with a leak or during maintenance activity.

6.6 Engineering Control

6.6.1 In work areas where benzene is present, engineering controls and work practices are used to reduce and maintain employee exposure to benzene at or below the action level, except where these controls are not feasible.

6.6.2 When engineering controls or work practices are not sufficient to reduce exposure at or below the action level concentration of 0.5 ppm benzene appropriate respiratory protection must be used as a supplement.

6.6.3 In the interim, when engineering controls and work practices are being installed or implemented, appropriate respiratory protection selected in accordance with the Respiratory Protection Program will be used.

6.6.4 When exposures exceed the action level, a written compliance plan is prepared that provides a schedule for the development and implementation of engineering and work practice controls that will reduce exposures at or below the action level, primarily by engineering controls and work practices. This plan is revised as necessary to reflect its current status.

6.7 Personal Protective Equipment

6.7.1 Respiratory Protection

6.7.1.1 All LRD and contractor personnel utilizing respiratory equipment must be properly trained, medically qualified, and quantitatively fit tested prior to the use of that equipment.

6.7.1.2 The Safety Department will coordinate quantitative fit testing of all LRD personnel who might be required to enter an area that could contain an airborne benzene concentration of greater than 0.5 ppm. These persons will be fit tested while wearing half-face and full-face air-purifying respirators.

6.7.1.3 Required respiratory protection includes:

6.7.1.3.1 Half face organic vapor or organic vapor/acid gas/P100 cartridge respirators if airborne benzene concentrations are less than 10 ppm.

6.7.1.3.2 Full face organic vapor or organic vapor/acid gas/P100 cartridge respirators if airborne benzene concentrations are less than 50 ppm.

6.7.1.3.3 Full face pressure-demand airline respirators with 5 minute escape pack or SCBA if airborne benzene concentrations are greater than 50 ppm or unknown.

6.7.1.4 Organic vapor and/or organic vapor/acid gas/P100 respirator cartridges must be discarded

6.7.1.4.1 at least every four hours for full face respirators (concentrations between 9-45ppm)

6.7.1.4.2 at least every six hours for half face respirators (concentrations <9ppm)

6.7.1.4.3 if vapor or gas breakthrough is detected

6.7.1.4.4 if a change in breathing resistance occurs

6.7.1.4.5 Concentrations of total airborne hydrocarbons and duration of use could result in cartridge breakthrough (saturation). For chemical cartridge use time limits refer to the Respiratory Protective Equipment Selection Guide.

6.7.1.5 Safety supplies and maintains 30 & 60-minute SCBA units primarily for use during emergency situations, or if air line use is impractical.

6.7.2 Protective Clothing

6.7.2.1 If there is a possibility of contact with a liquid mixture containing benzene, protective clothing must be utilized.

6.7.2.2 Adequate liquid benzene protection is normally provided by:

6.7.2.2.1 PVC Rain Suit

6.7.2.2.2 PVC or Neoprene Boots

6.7.2.2.3 PVC or Nitrile Gloves

6.7.2.2.4 Goggles and Face Shield

6.7.2.3 All exposed skin surfaces must be protected from liquid. Airborne (non-liquid) concentrations require only respiratory protection.

6.8 Spills, Leaks and Fire Mitigation

6.8.1 Spill or leak sources should be isolated as soon as possible while minimizing potential hazards to those involved.

6.8.2 For a benzene spill/fire the approach must be made with breathing air.

6.8.3 Eliminate all sources of ignition.

6.8.4 Stay upwind or crosswind of benzene spills/fires.

6.8.5 Use firefighting foam to suppress benzene vapors and extinguish benzene spills and fires.

6.9 First Aid and Medical Surveillance

6.9.1 First Aid Procedures

6.9.1.1 Eye And Face Exposure - Wash immediately with large amounts of water for 15 minutes. Report to First Aid.

6.9.1.2 Skin Exposure - Remove clothing and wash exposed skin with soap and water. Report to First Aid.

6.9.1.3 Inhalation Exposure - Remove victim to fresh air immediately. Apply artificial respiration if breathing has stopped. Call for medical assistance.

6.9.1.4 Ingestion - Do not induce vomiting, call for medical assistance.

6.9.2 Medical Surveillance

6.9.2.1 Medical surveillance consists of initial and annual medical examinations for covered employees. In some instances, further evaluation by a specialist may be necessary and further actions by the employer will be implemented.

6.9.2.2 Covered employees are required to participate in medical surveillance if they are exposed to benzene at/or above the action level 30 or more days per year or at/or above the PELs 10 or more days per year.

6.9.2.3 Medical surveillance includes the following:

6.9.2.3.1 Initially: a detailed occupational history

6.9.2.3.2 Initially: a complete physical examination

6.9.2.3.3 Initially: laboratory tests inclusive of a complete blood count with leukocyte count, quantitative thrombocyte count, hematocrit, hemoglobin, erythrocyte count and erythrocyte indices

6.9.2.3.4 Initially: additional tests as deemed necessary by the examining physician

6.9.2.3.5 Annually: brief history of new exposures to marrow toxins, changes in medicinal drug use, and appearance of physical signs relating to blood disorders

6.9.2.3.6 Annually: laboratory tests inclusive of a complete blood count with leukocyte count, quantitative thrombocyte count, hematocrit, hemoglobin, erythrocyte count and erythrocyte indices

6.9.2.3.7 Annually: additional tests as deemed necessary by the examining physician

6.9.2.4 Employee is provided with the examining physician's written opinion within 15 days of the examination.

6.9.2.5 No LRD personnel are currently enrolled in the medical surveillance program since personal monitoring for benzene has indicated no benzene exposures in excess of the Action Level.

6.9.2.6 In emergency situations when exposure to benzene is unknown or expected to be in excess of the PEL, biological monitoring for urinary phenol levels is performed.

6.9.2.6.1 Exposed employee must provide a urine sample at the end of the employee's shift.

6.9.2.6.2 A laboratory analysis of urine is obtained within 72 hours of collection to measure the concentration of phenol, which is one of the products of benzene metabolism. If the sample cannot be delivered to the lab within 72 hours of exposure, the sample shall be frozen until it can be delivered to the lab.

6.9.2.6.3 This test provides an important supplement to air sampling as a determination of benzene exposure.

6.9.2.6.4 OSHA has set the urinary phenol limit, as determined by collection at the end of the shift, at 75 milligrams of phenol per liter of urine.

6.9.2.6.5 If the urine phenol level is less than 75 mg/L, then no further action is needed; however, if the level is equal to or greater than 75 mg/L, the employee is required to undergo additional laboratory tests.

7.0 TRAINING

7.1 All personnel who may be required to work in areas where airborne benzene concentrations could exceed 0.5 ppm must have attended OSHA required training prior to entering said work areas.

7.2 Training for the Benzene Compliance Plan and revisions to this Plan will be provided to employees and contractors via the monthly HESS meeting.

7.3 MPC employees with the potential for exposure to benzene during their work at the LRD are required to complete awareness level computer based training each year.

8.0 RECORDKEEPING

8.1 All records associated with this Standard and its implementation shall be maintained in accordance with Marathon Petroleum Corporation Enterprise Records and Information Management Policy (MPC6003)**.**

9.0 REFERENCES

9.1 OSHA: Benzene, 29 CFR 1910.1028

9.2 MPC Benzene Exposure Control Program, HLT-2013-DN

9.3 MPC Employee Health Monitoring Examination Protocol Standard, HLT-2025-DN

9.4 LRD Industrial Hygiene Standard Practice, RSW-0118-GV

9.5 LRD Work Permit Standard Practice, RSW-0102-GV

9.6 LRD Confined Space Entry Standard Practice, RSW-0106-GV

9.7 LRD Hazard Characterization and Respiratory Protective Equipment Selection Guide, RSW-A-002-GV

9.8 DOC. LIB. NO.: 311.8

10.0 APPENDICES

10.1 BENZENE-CONTAINING EQUIPMENT AT LRD

Unit 8
Feed Surge Drum (8-1201)
Product Separator (8-1202)
Stripper Receiver (8-1205)
Stripper Column (8-1101)
LSR Naphtha Hydrotreater Reactor (8-2501)

Unit 9
Liquid Feed Dryer (9-1201-01)
Liquid Feed Dryer (9-1201-02)
Product Separator (9-1202)
Stabilizer Receiver (9-1205)
Stabilizer (9-1101)
Reactor A (9-2501-01)
Reactor B (9-2501-02)

Unit 10
Crude Column (10-1101)
Splitter (10-1107)
Splitter Receiver (10-1211)
Stabilizer (10-1106)
Deisopentanizer (DIP) Column (10-1109)
DIP Overhead Accumulator (10-1228)
Recovery Pot (10-1231)
Preflash Overhead Receiver (10-1242)

Unit 14
Recycle Gas Amine Scrubber (14-1101)

Unit 16
FCC Gasoline Merox Reactor (16-1201-01)
FCC Gasoline Merox Reactor (16-1201-02)

Unit 210
Splitter (210-1107)
Stabilizer (210-1106)
Crude Preflash Drum (210-1218)
Benzene Stripper (210-1110)
Overhead Receiver (210-1230)

11.0 REVISION HISTORY

Revision Number	Description of Change	Written by	Approved by	Revision Date	Effective Date
0	Original Approval	Roger Gautreau	Refining Management Team (RMT)	09-18-08	09-18-08
1	3 Year Review. Changes at 4.2.8,6.2.4, 6.4.4.1, 6.4.4.2,6.5.2, 6.7.1.4.3 and 6.7.2.2.2.	Nate Bumstead	Refining Management Team (RMT)	12/1/2011	12/1/2014

Revision Number	Description of Change	Written by	Approved by	Revision Date	Effective Date
2	Updated entire document to align with Corporate Standard, added Section 6.2.1 EXAM	Jessica Myers	VPP Committee – 5/27/2014 RLT- 5/29/2014	5/30/2014	5/30/2014
3	Three-year review/revision. No changes required.	Jessica Myers	Safety Department	10/8/2014	10/8/2014
4	Removal of respirator brand name, revised the cartridge change-out requirements in 6.7.1.4	Jessica Myers	VPP: 10/19/2017 RLT: 10/26/2017	10/8/2017	10/26/2017

5	Routine triennial review, no changes	Alex Mapel	Safety	10/30/2020	10/30/2020
6	Added reference to Unit RMPs for identification of benzene-containing equipment in 6.1.1, added list of equipment in 10.1	Brendan Mullins	Safety	11/10/2021	11/10/2021