

Marathon Petroleum Company LP			
Lightning Safety	Document No.: RSW-SAF-094-DT	Approval Date: 05/14/20	Page 1 of 8
	Revision No.: 2	Next Revision Date: 6/05/24	
	Document Custodian: Environmental, Safety and Security		

Overview

Purpose –

According to the National Lightning Safety Institute, personnel are at extreme risk of lightning when cloud-to-ground lightning strikes are occurring within five (5) miles. This document outlines requirements to reduce the risks of personnel injury presented by lightning storms during normal activity and turnaround operations.

Scope –

This document applies to the Marathon Petroleum Company LP (MPC) Refining Organization.

Records Retention –

Printed copies of this document should not be retained more than 12 months. Any revision to this document will be retained indefinitely.

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Table of Contents (recommended for long or complex documents)

Purpose.....1
Scope.....1
Records Retention.....1
Table of Contents
1. References.....2
2. Roles and Responsibilities.....2
3. Definitions.....3
4. Requirements/Procedure4
5. Attachments7
6. Appendix.....8
7. Revision History.....9

1. References

- 1.1. National Fire Protection Association (NFPA)
 - 1.1.1. NFPA 780 – Standard for Installation of Lightning Protection Systems
- 1.2. National Lightning Safety Institute (NLSI)
 - 1.2.1. Recommendations from National Lightning Safety Institute

2. Roles and Responsibilities

- 2.1. Operations Shift Foreman/Supervisor, Maintenance/Turnaround Coordinator, and Safety
 - 2.1.1. Upon notification of a Lightning Warning, communicate to the site work to discontinue any work outside of a Protective Space per the Lightning Safety Guidance Drawing in [Appendix A](#).
 - 2.1.2. Maintain awareness of weather conditions and determine if jobs are [“Essential Work”](#) pursuant to the definition set forth.
 - 2.1.3. Ensure that all stakeholders agree on any confined space entry job that will continue through a Lightning Warning has proper protection for the confined space attendant and rescue personnel.
 - 2.1.4. Safety Department representation may be involved in making Essential Work determination.
- 2.2. Security
 - 2.2.1. Monitor Early Warning Detection System and communicate alert/all clear announcements to the site.
- 2.3. MPC Permit Writer/Owner
 - 2.3.1. Upon notification of a Lightning Warning, the Owing Department Permit Writer must ensure that all work described in Section 3.3.4 has been stopped, the Safe Work Permits suspended and personnel seek shelter per Section 3.5. Once the lightning alert is cancelled, the Owing Department Permit Writer must determine if the Safe Work Permit can be reinstated with the appropriate air monitoring and communication with the Servicing Group or whether a new Safe Work Permit will be required to get the work stated again.

Document Name: Lightning Safety	Doc. No.: RSW-SAF-094-DT	Rev. No.: 2	Page 2 of 8
---------------------------------	--------------------------	-------------	-------------

3. Definitions

3.1. Early Warning Detection Service

- 3.1.1. A real-time severe weather monitoring service provided to MPC by a private meteorological organization.

3.2. Essential Work

- 3.2.1. Outdoor work that must occur to prevent an imminent process safety event, critical maintenance/turnaround work that poses a greater personal safety or process safety risk by terminating, or to complete critical plant functions that pose a greater personal safety or process safety risk by terminating.

3.3. Lightning Warning

- 3.3.1. An alert/warning of confirmed cloud to ground and cloud to cloud lightning is detected at a range of six (6) miles of the site communicated from an Early Warning Detection System (EWDS) or determined by the site if the EWDS is unavailable.

3.4. Non-Essential Work

- 3.4.1. Work without Overhead Protection that can be delayed without creating the hazard of an imminent personnel or process safety event.

3.5. Overhead Protection

- 3.5.1. Any fixed structure, including Coker derricks, with adequate grounding.

3.6. Protective Shelter

- 3.6.1. Any substantial structure such as a zone/maintenance shop, operator's shelter, blast shack, work trailer or fully enclosed metal vehicles (windows closed).

3.7. Protective Space

- 3.7.1. Any protective shelter or location with adequate Overhead Protection to provide protection from lightning.

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Document Name: Lightning Safety	Doc. No.: RSW-SAF-094-DT	Rev. No.: 2	Page 2 of 8
---------------------------------	--------------------------	-------------	-------------

4. Requirements

4.1. Detection

- 4.1.1. MRD will use “SkyGuard” to monitor lightning strikes in the area.
- 4.1.2. When severe weather is in the area, site Security shall continuously monitor the Early Warning Detection Service and provide notification per [Section 4.2](#) of this standard that a lightning strike has occurred and lightning precautions should be implemented.

4.2. Initial Detection and Notification Protocol

- 4.2.1. When lightning is detected at a range of six (6) miles from the site, a notification is provided to site’s Security Operations Center (SOC) from the Early Warning Detection Service to allow adequate travel time to a Protective Shelter. SOC shall notify remaining plant personnel via an announcement over the facility radio channels, annunciation system, etc. An example of the announcement is below:

“Attention all personnel, lightning has been detected in the area. All Non-Essential Work without overhead protection shall cease until further notice.”

4.3. Work Continuation Determination

- 4.3.1. Work in a Protective Space can continue during a lightning event using the [Appendix A](#) diagram as guidance. This would include work under Overhead Protection, such as:
 - 4.3.1.1. Work on pumps, compressors, equipment below the fin fan deck,
 - 4.3.1.2. Work on removing a blind from a scaffold that is below the pipe rack,
 - 4.3.1.3. Work on exchangers that is not upper most level,
 - 4.3.1.4. Confined space entry work with Overhead Protection for the hole watch and emergency responders,
 - 4.3.1.5. Work in an Analyzer Building,
 - 4.3.1.6. Loading activities under a covered loading rack, or
 - 4.3.1.7. Coke cutting or other activities below the coke derricks.
- 4.3.2. Confined Space Entry operations that meet the requirements set forth by this safe work practice shall pre-determined by MPC Safety and MPC Maintenance Coordinators in the planning phase. This shall be documented by MPC Safety on the Confined Space Reference Sheets for the space.
- 4.3.3. The Operations Shift Foreman/Supervisor and Maintenance/Turnaround Coordinator in cooperation with Safety Supervisor are responsible for determining work activities, not in Proactive Spaces, that meet the definition of [“Essential Work”](#) as defined above and may continue during a Lightning Warning.

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4.3.4. Examples of Essential Work that may continue include but are not limited to:

- 4.3.4.1. Responding to a process unit upset with potential of PSM consequences,
- 4.3.4.2. Completing a Hot Tap, stopple job, or clamping job already in progress,
- 4.3.4.3. Responding to a plant emergency event,
- 4.3.4.4. Work activities required to safe the unit to prevent eminent PSM consequences,
- 4.3.4.5. Ground-level movement to or between Protective Shelters (e.g., building to building, building to vehicle), or
- 4.3.4.6. Evacuation.

NOTE: Weather conditions should be verified by MPC Coordinators or responsible parties prior to starting work tasks, such as, Hot Taps, Critical Lifts and Confined Space Entries to determine if adequate time allows to perform work safely.

4.3.5. Examples of Non-Essential Work that must be terminated during a Lightning Warning include but are not limited to:

- 4.3.5.1. Any work on the upper most level of a structure without Overhead Protection,
 - 4.3.5.2. Any work on the top level in the pipe rack,
 - 4.3.5.3. Work in open areas with no Overhead Protection,
 - 4.3.5.4. Confined space entry that cannot provide Overhead Protection for the hole watch and emergency responders, including tank entry or work on the roof of a tank,
 - 4.3.5.5. Crane or picker operations (see Section 4.3.6), or
 - 4.3.5.6. Elevated loading activities on the loading racks where no Overhead Protection is provided.
- 4.3.6. All crane work shall be stopped, and the booms be lowered to less than thirty (30) feet above grade when possible. If a Lightning Warning is made during a lift, it is acceptable to continue the lift until the load is in a safe position. Operators of cranes and lifts may evacuate the equipment and seek refuge in a Protective Shelter.
- 4.3.7. If applicable to the location, ship/barge loading shall be shut down. No ship/barge mooring operation will commence from the time of the initial notification until the “all clear” has been sounded. If mooring operations were in progress at time of alert, the dock supervisor or chief operator may determine, if weather permits, to continue securing the ship/barge.

4.4. Communication and Notifications

4.4.1. Upon receiving the communication that lightning has been detected within a range of six (6) miles of the site, the following Lightning Warning communication process shall be executed.

Department	Miles	Action
Security Operations Center (SOC)	6	Shall notify all personnel as per Section 4.2 of this document.
Permit Writer/Owner	6	Shall ensure all Non-Essential Work permitted is stopped and the jobsite secured.
Security Operations Center (SOC)	All Clear	Shall notify all personnel per Section 4.6 of this document.

4.5. Sheltering

4.5.1. Upon receiving the communication that lightning has been detected within six (6) miles of the site, all MPC Employees and Contractors performing Non-Essential work per [Section 4.3.5](#) shall secure their job sites immediately and shall take cover in a Protective Shelter.

4.5.1.1. Take shelter in locations such as:

- 4.5.1.1.1. Safe locations in process unit as defined by Appendix B,
- 4.5.1.1.2. Permanent/substantial buildings (metal construction is acceptable if properly grounded),
- 4.5.1.1.3. Blast trailers or blast resistant tents, if designed for lightning protection and properly grounded,
- 4.5.1.1.4. Fully enclosed all-metal vehicles, or
- 4.5.1.1.5. Zone/maintenance shops.

4.5.1.2. Do Not Take Shelter in the following locations:

- 4.5.1.2.1. Open areas,
- 4.5.1.2.2. Close proximity to ungrounded metal objects,
- 4.5.1.2.3. Inside smoke shacks, or
- 4.5.1.2.4. On rooftops.

4.6. Return to Work Authorization

4.6.1. Upon all clear notification by the Early Warning Detection System service, an “all clear” or “lightning alert ended” will be given. Security shall notify plant personnel via an announcement over the site radio channels, annunciation system, etc.

4.6.2. This alert shall be given 30 minutes after the last strike.

4.6.3. An example of the announcement is below:

4.6.4. “Attention All Personnel, lightning is no longer in the detected area. Refinery lightning protection requirements are no longer in effect.”

Document Name: Lightning Safety	Doc. No.: RSW-SAF-094-DT	Rev. No.: 2	Page 2 of 8
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5. Attachments

5.1. Lightning Procedure Information Bulletin

The following document is provided as a guidance form to briefly explain this document.

[RSW-SAF-094-DT-FORM01](#)

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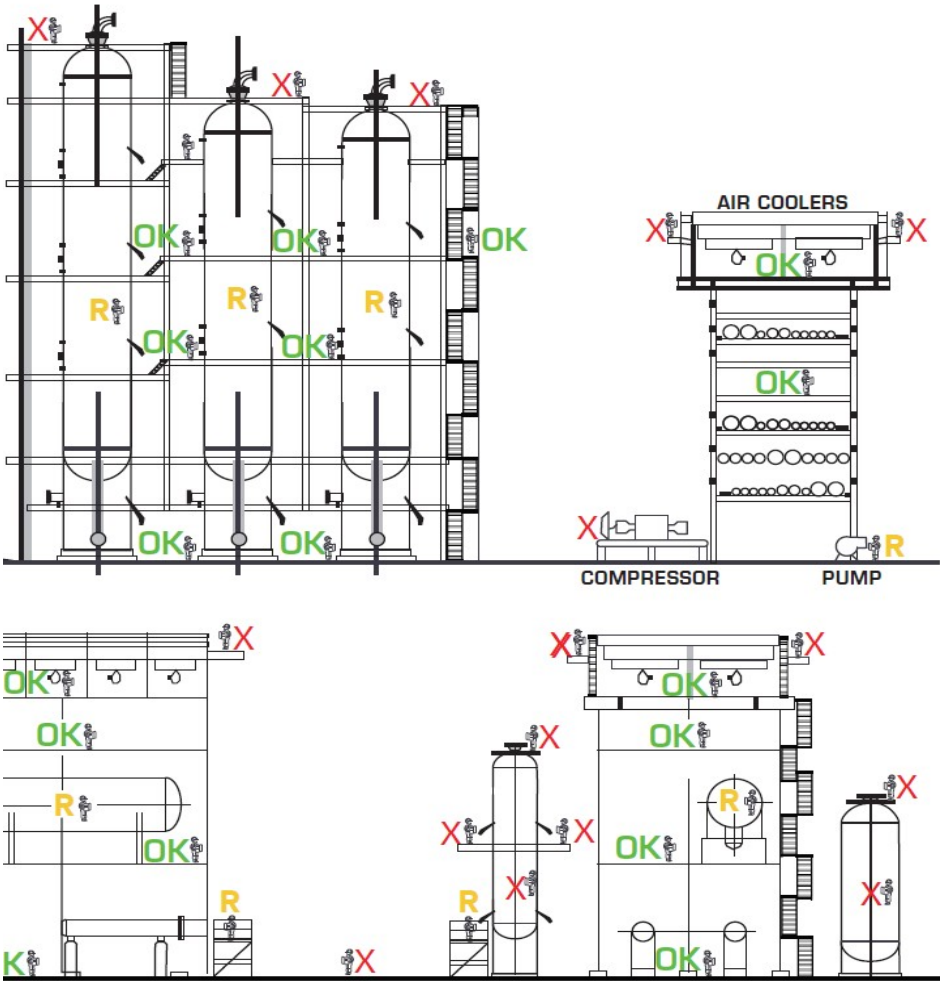
6. Appendix A

6.1. Lightning Safety Guidance Drawing

The following drawings are provided as guidance for approved work during a lightning alert.

X	Work that shall be stopped in a Lightning Warning if not deemed Essential Work.
R	Review for adequate Overhead Protection for hole watch and emergency responders for confined space to continue. Review equipment manufacture requirements necessary before proceeding.
OK	Work allowed to continue in a Lightning Warning.

Note: Overhead Protection for confined space attendant and emergency responders shall be confirmed if work is allowed within a confined space during a lightning alert.



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7. Document Revision History

Rev. No.	Description of Change	Author	Approved By	Rev. Date	Effective Date
0	Original Issuance	Wes Merrifield	DLT	3/31/2019	06/5/19
1	Added attachment section to include RSW-SAF-094 -DT - Form 1. No procedural changes made.	Eric Sponaugle	Al Morales	10/30/19	10/30/19
2	Updated definitions to match RSP, Updated form 1 for change in definition of Overhead Protection and Protective Space	B. Dibert	Al Morales	5/14/20	5/14/20

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