

Marathon Petroleum Company LP			
Electrical Cable Pulling	Document No.: RSW-SAF-015-DT	Approval Date: 9/23/16	Page 1 of 6
	Revision No.: 06	Next Revision Date: 09/23/21	
	Document Custodian: Environmental, Safety and Security		

1.0 PURPOSE

1.1 This document provides requirements to ensure all electrical cable pulling in the refinery is completed in a safe manner. It defines requirements, limitations and responsibilities for performing an electrical cable pull.

2.0 SCOPE

2.1 This procedure applies to all Contractors, Subcontractors and Employees working on Michigan Refining Division (MRD) owned or controlled property, as well as work performed under a contract to Marathon Petroleum Company, LP (MPC).

3.0 PROCEDURE

3.1 Electrical cable pulling will be categorized as normal, intermediate, or heavy. If deemed "Heavy", a comprehensive plan including a check of the cable pulling equipment will be conducted to ensure that the equipment is being used within its design limits. If deemed "Intermediate", required classification documentation will be provided, and a pre-pull walk-down and checklist will be completed. Hand-Powered or "Normal" pulls with six (6) or less individuals will require no additional documentation.

CABLE PULL CLASSIFICATION REQUIREMENTS – TABLE 1

<u>Cable Pull Classification</u>		<u>Criteria</u>	<u>Requirements</u>
Normal	Hand - Powered	<ul style="list-style-type: none"> ▪ A hand-powered option is an acceptable pulling method where personnel can safely perform the task. ▪ 6 or less individuals 	<ul style="list-style-type: none"> ▪ Review with applicable Engineering Department in advance to ensure rigging's anchor points are acceptable and minimum cable bending radius is not violated.
Intermediate	Hand-Powered or Mechanically Powered	<ul style="list-style-type: none"> ▪ Hand Powered > 6 individuals ▪ < 1000' cable pull length ▪ < 5 rigging points ▪ < 2000 lbs. of total cable weight through entire pull ▪ Maximum calculated pulling tension is <50% of the cable manufacturer's or pulling /rigging equipment allowable pulling tension ▪ No operating process equipment in the vicinity of the "line-of-fire" 	<ul style="list-style-type: none"> ▪ Form 02 Cable Pull Checklist completed and signed by all required personnel following pre-pull walk-down ▪ Review with applicable Engineering Department in advance to ensure rigging's anchor points are acceptable and minimum cable bending radius is not violated.
Heavy	Mechanically Powered	<ul style="list-style-type: none"> ▪ > or equal to 1000' cable pull length ▪ > or equal to 5 rigging points ▪ > or equal to 2000 lbs. of total cable weight through entire pull ▪ Operating process equipment within the vicinity of the "line-of-fire" ▪ Pull is designated by a MPC Manager or MPC Engineer as requiring this classification 	<ul style="list-style-type: none"> ▪ Form 01 Cable Pull Plan completed by the Company performing the pull and turned in 1 week prior to cable pull date. Must include pull tension/sidewall pressures, puller and pulling arrangement, rigging details ▪ Pre-Pull meeting required 8 to 24 hours prior to pull ▪ Form 02 Cable Pull Checklist completed and signed by all required personnel following pre-pull walk-down

Note: If there is any question, whatsoever, as to which type of pull is being planned, then use the Heavy cable pull classification.

3.1.1 Other Requirements / Exceptions

3.1.1.1 Hand Powered pulls with more than 6 individuals must complete the requirements of the intermediate pull unless approval is granted by MPC Electrical Foreman, Construction Manager or Maintenance Supervisor overseeing the work by completing [RSW-SAF-015 Form03-DT Exception for Cable Pull Checklist](#).

3.1.1.2 Heavy Pulls require completion and submission of Form [RSW-SAF-015-FORM01-DT Electrical Cable Pull Plan](#) to MPC for approval 1 week prior to the date of the cable pull. Form 01 will be reviewed and approved by a representative of the Engineering Department and Electrical Coordinator. A copy shall be sent to the Owing Department Foreman and Safety Department for review.

3.1.1.3 The Electrical Cable Pull Plan (Form 01) shall be completed by the Company performing the electrical cable pull.

Note: Compliance with this procedure does not relieve the contractor of any liability associated with any power activated pulling device utilized for the cable pull.

3.1.1.4 FORM 01 Electrical Cable Pull Plan shall include:

- Detailed calculations for pulling tensions and sidewall pressure for each segment.
- Wire Pull Diagram and/or Straight Line Drawing of the pull
- Overall plot plan outlining of the cable pull showing its travel path with locations of the cable puller and cable reel.
- Manufacture specifications for the anchoring system used for the cable puller, cable reel and cable feeder. This shall include a drawing/detail of how the system will be anchored.
- Rigging details of each point rigging will be used. Include all connections of sheaves, shackles, slings, lever hoists, etc. and how it will be connected. This shall include what these items will be anchored to.
- Vendor specification sheets showing capacities/ratings for all rigging components and pulling equipment.

3.1.1.5 Consider the accuracy of the pull load weight when developing the cable pull plan. The person preparing the plan must include a safety factor to apply for the following:

- Distance of pull
- Weight of cable
- Number of bends in the raceway
- Elevation changes
- Number of tray rollers.
- Weather conditions (Temperature)

These factors determine the load placed on the puller and rigging being used for the pull. The maximum load shall not exceed 90% of the equipment's rated capacity.

3.1.1.6 In emergency situations approval from the Department Manager can be granted to supersede the required 1 week approval submitted to MPC.

3.1.1.7 A Pre-pull review and walk shall take place at least 8 hours prior to the pull to review the plan with the Pulling Crew Foreman, Construction Coordinator, Operations Foreman, Engineering Representative and MPC Safety. The meeting will explain the cable pull and work plans to the Owing Department so they can prepare any special operation procedures/instructions or precautionary measures needed.

- 3.1.2 Immediately prior to the cable pull, a pre-pull meeting will be held and [FORM 02](#) Cable Pull Checklist will be completed and signed by the Pulling Crew Foreman, Construction Coordinator, Engineering Representative, Safety and Operations Foreman. Verification that all equipment is installed per the Cable Pull Plan and has been inspected shall occur.
- 3.1.2.1 If the “stored energy” of the cable pull is adjacent to operating lines, equipment or buildings, these should be identified at this time.
- 3.1.2.2 The pre-pull meeting shall be held prior to the cable pull at each new work location and shall be repeated for any employees newly assigned to the operation.
- 3.1.3 Signed copies of all applicable forms shall be kept with the hard copy of the Safe Work Permit at the jobsite.

3.2 GENERAL GUIDLINES

- 3.2.1 If a power activated puller will be anchored to any equipment or pipe racks it is to be identified in the Cable Pull Plan Form 01. For Intermediate Pulls, any puller anchored will be approved by the Attendees signing Form 02 Cable Pull Checklist.
- 3.2.2 To ensure that all nonessential personnel are safely outside the pulling zone due to the line of fire and falling object hazards during “Intermediate” or “Heavy Pulls,” it is the Construction Coordinator’s responsibility to notify appropriate MRD Owing Department personnel at least eight hours in advance of any Heavy Pull.
- 3.2.2.1 All nonessential work within the cable pull zone shall be halted.
- 3.2.2.2 The Owing Department shall have any special instructions, procedures or precautionary measures in use before the cable is pulled.
- 3.2.3 No employee shall be permitted to position themselves directly beneath or in the line of fire of cables being pulled by any power activated puller. Barricading is to occur if these locations cannot be monitored while a pull is occurring.
- 3.2.4 No employee is permitted to position themselves on any cross arm except as necessary to guide the pulling rope through a roller block; while stringing the block(s), the pulling device shall be de-energized.
- 3.2.5 When applicable the Pulling Crew Foreman shall be in a position to view all cable pulling activities. Ground personnel shall be utilized to observe the cable pulling activity from strategic points along the path of installation and to arrange a signaling system, which will allow everyone on the job to communicate any condition that may warrant immediate cessation of the pull.
- 3.2.6 The Pulling Crew Foreman shall ensure reliable means of communication – via two-way radios, or direct line of sight exists between the reel tender and the pulling rig operator at all times during the pull.
- 3.2.7 If a mechanical puller is being used in the pull, a tension metering device shall be affixed to the equipment to ensure the equipment and load is not subjected to tensions outside of the allowable range during the pull.
- 3.2.8 The pull shall be designed such that the manufacturer’s requirements for the electrical cable are not exceeded or violated, including but not limited to: pulling tension, sidewall pressure, bending radius, and pulling grip selection. Appropriate documentation must be provided for pulls utilizing mechanical pullers.
- 3.2.9 MPC Management or MPC Engineering may reclassify any pull as a Heavy Pull.

3.3 RIGGING

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- 3.3.1 Slings must be designed with a safety factor of five. Shackles and lifting lugs must be designed in accordance to ASME B30 standards. See RSW-SAF-029-DT RIGGING AND LIFTING PROCEDURE for all requirements for rigging equipment.
- 3.3.2 Load ratings of all pulling lines, load-bearing hardware/accessories, rigging and hoisting equipment shall never exceed the manufacturer's rated capacity. These ratings shall be provided in FORM 01 Cable Pull Plan.
- 3.3.3 All cables and slings shall be inspected for breaks, frays or damages prior to being utilized for any electrical cable pull.
- 3.3.4 Rigging anchorage points shall be capable of supporting the intended load. Appropriate anchorage points include but are not limited to structural steel and utility poles.
 - 3.3.4.1 All structural supports used for anchoring rigging equipment must be verified by a representative of the Engineering Department to ensure the integrity of the supports. They will sign off on the Cable Pull Checklist prior to the completion of the "At the Site Review" portion. This applies to Heavy Pulls.
- 3.3.5 Reel handling equipment including pulling and tensioning devices shall be inspected in accordance with manufacturer's requirements by a competent person and confirmed in good working order prior to use. All such equipment shall be secured and aligned prior to the start of any cable pulling activity.

3.4 TRAINING

- 3.4.1 All personnel whose duties include rigging shall be trained in proper rigging techniques applicable to the work the individual is to perform.
- 3.4.2 All personnel including contractor employees shall present proof of training in rigging upon request.

3.5 RESPONSIBILITIES

- 3.5.1 Construction Coordinator – Notifies appropriate MRD Owing Department personnel at least eight hours in advance of any "Heavy Pull". Ensures that all nonessential personnel are safely outside the pulling zone due to the line of fire and falling object hazards during "Intermediate" or "Heavy Pulls,". Determines when all preparations are complete and makes the decision when to start the cable pull. Determines when a cable pull is an emergency and is responsible for communicating this to MPC. Reviews and signs the Cable Pull Plan and Pre-Pull Checklist. Leads the "At the Site Review" section of the Cable Pull Checklist.
- 3.5.2 Complex Supervisor or Designee – Is to review all associated documents with an "Intermediate" or "Heavy Pull." All special instructions, procedures or precautionary measures specific for that owning area are to be communicated by this individual. Participates in the pre-pull walk, the "At the Site Review" section of the checklist and signs the Cable Pull Checklist.
- 3.5.3 Engineering Representative – Reviews and signs the Cable Pull Plan. Participates in the pre-pull walk, the "At the Site Review" section of the checklist and signs the Cable Pull Checklist.
- 3.5.4 Pulling Crew Foreman – Has overall responsibility of the cable pull and crew making the pull and acts as the competent person of the cable pull. Reviews and signs the Cable Pulling Plan and Cable Pull Checklist. Ensures all permits and forms are signed prior to cable being pulled.
- 3.5.5 Safety Representative – Is to review all associated documents with an "Intermediate" or "Heavy Pull." Participates in the pre-pull walk, the "At the Site Review" section of the checklist and signs the Cable Pull Checklist.

3.6 RECORDS

- 3.6.1 The original of the “Heavy” [Electrical Cable Pull Plan \(Form 01\)](#) and associated documents and drawings shall be kept in the Engineering central files for a minimum of 7 years.
- 3.6.2 All documents associated with a “heavy” pull (Forms 01 and 02) will be retained for a minimum of 7 years. If the cable pull is associated with a confined space permit then copies of Forms 01 and 02 will be kept with the original confined space permit for a minimum of 30 years per Marathon policy.

4.0 DEFINITIONS

- 4.1 Normal pull- is an electrical cable pull that does not utilize a power activated puller and 6 or less individuals. This pull would only involve feeding or pulling electrical cable by hand.
- 4.2 Intermediate pull- is any electrical cable pull that involves the use of a power activated puller to pull an electrical cable that falls into the classification criteria listed in Table 1 or more than 6 individuals pulling cable by hand.
- 4.3 Heavy pull- is any electrical cable pull that involves the use of a power activated puller to pull an electrical cable that falls into the classification criteria listed in Table 1.
- 4.4 Process Line- for purposes of this procedure means any line in the refinery containing hydrocarbons or toxic or flammable materials. Water, cooling water, and plant air lines for this procedure are not considered process lines unless loss of these lines will result in a plant or unit outage. This means that in most cases cooling tower fan motors and gearboxes, reloading sand and salt filters, and catalyst replacement will not be “heavy” pulls. Operations and Products Control shall work out boundary areas for these situations with the Servicing Group.
- 4.5 Construction Coordinator- is the employee supervising the personnel making the pull. This is the MPC Coordinator for the installation or their designee.
- 4.6 Pulling Crew Foreman- is the job foreman for the company responsible for installing the cable.
- 4.7 Complex Supervisor/Designee- is the Owning Department representative for the location that the task is being performed.
- 4.8 Competent Person- Through proper experience and education is capable of identifying existing and predictable hazards in the surroundings of working conditions that are unsanitary, hazardous, or dangerous to the employees and who has authorization to take prompt corrective measures to eliminate them.
- 4.9 Tension- is the force that is exerted on the cable as it is pulled through a raceway. Tension on the puller or power driven device shall be carefully monitored to prevent any unplanned event that could damage the cable or injure an employee.
- 4.10 Puller - is an electrical or pneumatic drive cable pulling machine.

5.0 REFERENCES

- 5.1 [RSW-SAF-029-DT RIGGING AND LIFTING PROCEDURE](#)
- 5.2 ASME B30 Standards
- 5.3 [RSW-SAF-015-Form01-DT Electrical Cable Pull Plan](#)
- 5.4 [RSW-SAF-015-Form02-DT Electrical Cable Pull Checklist](#)
- 5.5 [RSW-SAF-015-Form03-DT Exception for Cable Pull Checklist](#)

6.0 REVISION HISTORY

Revision number	Description of change	Written by	Approved by	Effective date
2	Added Intermediate Pull Category	Doug Becraft	Safety Steering Committee	01/23/2012
3	Removed review marks left in error	F. Ebbert	L. Mazur	01/25/2012
4	Scheduled review no changes at this time	B. Dibert	S. Windom	09/16/13
5	Updated header per RGD-1051-DT, corrected footer dating	F. Ebbert	J. Rabideau	10/31/15
6	Added hand powered pulls with more than 6 persons follow intermediate pull, Removed form 3 and 4 scale drawings, Revised form 3 to an approval for hand pulls with more than 6 persons, Restructured form 1 to better define cable pull plan submissions and added language to reflect form in procedure, Restructured form 2 for site review sign offs and justification for intermediate pulls, Changed reviewers of submitted Heavy Pull Plans, Added language and updated form 2 for an Engineering review of structural supports, Various terminology and wording changes throughout	B. Dibert	Electrical Team with Maintenance and Engineering / D. Leaver	9/21/16