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Doc Custodian: Safety Supervisor		Refinery Safe Work Procedure
Approved By: Troy Champeaux	Electrical Cable Pull Policy	
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TABLE OF CONTENTS

1.0	PURPOSE.....	2
2.0	SCOPE.....	2
3.0	PROCEDURE	2
3.1	Pull Classifications	2
3.2	Cable Pull Plans.....	3
3.3	General Guidelines	5
3.4	Rigging	5
3.5	Training.....	7
3.6	Pre-Pull Walkdown.....	7
4.0	ROLES AND RESPONSIBILITIES	7
4.1	MPC Foreman/Coordinator	7
4.2	Cable Pull Foreman	8
4.3	Electrical Department Supervision or Designee	8
4.4	Contractor Safety Representative	8
4.5	Tugger Operator	8
4.6	Reel Tender.....	8
4.7	Signal Person	8
5.0	DEFINITIONS.....	9
6.0	DOCUMENTS AND RETENTION	9
7.0	ATTACHMENTS	10
7.1	Attachment A: Hand Pull with Rigging Checklist.....	10
7.2	Attachment B: Intermediate Pull Checklist	10
7.3	Attachment C: Heavy Pull Plan	10
8.0	REVISION HISTORY	10

1.0 PURPOSE

- 1.1 To provide guidelines and to define the requirements necessary to ensure all electrical cable pulls are completed in a safe manner using various methods and available technology.
- 1.2 To provide a means to classify electrical cable pulls as Hand, Intermediate, or Heavy, and define corresponding requirements for each classification.
- 1.3 To establish training requirements for those personnel involved in rigging and pulling of electrical cable

2.0 SCOPE

- 2.1 This procedure defines requirements, limitations, and responsibilities for making electrical cable pulls.
- 2.2 This procedure applies to all persons, including all visitors, contractors, subcontractors, and employees working at the Galveston Bay Refinery (GBR) owned or controlled property.

3.0 PROCEDURE

3.1 Pull Classifications

- 3.1.1 All electrical cable pulls shall be identified as either Hand Pulls, Hand Pulls with rigging, Intermediate Pulls, or Heavy Pulls, prior to their execution. Defined Pull method, criteria, documentation, and other requirements for each pull classification can be referenced in Table 1 – Pull Classifications.

Table 1 – Pull Classifications

Cable Pull Classification	Pull Method	Criteria	Other Requirements
Hand	Hand-Powered / No Rigging	<ul style="list-style-type: none"> • A hand-powered option is an acceptable pulling method where personnel can safely perform the task. • Cable being pulled in raceway or cable tray by hand without use of mechanical means or rigging 	<ul style="list-style-type: none"> • JJSV, JSA and issued SWP by owning Department • No upper-level approval or review needed

Hand	Hand-Powered / With Rigging	<ul style="list-style-type: none"> • A hand-powered option is an acceptable pulling method where personnel can safely perform the task. • Cable being pulled in raceway or cable tray by hand and where rollers and/or dollies requiring rigging to structure for anchor points 	<ul style="list-style-type: none"> • Hand Pull with Rigging Checklist – Attachment A • Ensure rigging’s anchor points are acceptable and minimum cable bending radius is not violated. <p>Approvals to be granted by the following:</p>
Intermediate	Mechanically Powered	<ul style="list-style-type: none"> • <1000’ cable pull length • < 5 rigging points • <2000 lb. of total cable weight through entire pull • Maximum calculated pulling tension is <50% of the cable manufacturer’s or pulling equipment/rigging allowable pulling tension • No operating process equipment in the vicinity of the “line-of-fire” • Straight-line aerial cable pulls on engineered poles or structures 	<ul style="list-style-type: none"> • Intermediate Pull Checklist – Attachment B • Pre-pull walkdown per section 3.6 <p>Approvals to be granted by the following:</p> <ul style="list-style-type: none"> ▪ MPC E&I Foreman/Coordinator/Advisor ▪ Electrical Department Supervision or Designee for aerial
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 lb. of total cable weight through entire pull • Operating process equipment within the vicinity of the “line-of-fire” 	<ul style="list-style-type: none"> • Heavy Pull Plan – Attachment C per section 3.2 • Pre-pull walkdown per section 3.6 • Intermediate Pull Checklist – Attachment B per section 3.6 <p>Approvals to be granted by the following:</p> <ul style="list-style-type: none"> ▪ MPC E&I

Note: If there are any questions as to which type of pull should be planned, then the Heavy Pull classification shall be used.

3.2 Cable Pull Plans

- 3.2.1 **Hand Pulls (No Rigging)** require a JJSV, JSA, and issued SWP by the owning department.
- 3.2.2 **Hand Pulls with Rigging** require the Hand Pull with Rigging Checklist (Attachment A) to be completed and signed by MPC E&I Foreman/Coordinator, Cable Pull Foreman, Reel Tender, Signal Person, and/or Electrical Department Foreman or Designee (When Applicable).
- 3.2.3 **Intermediate Pulls** require a pre-pull walkdown to be performed, and the Intermediate Pull Checklist (Attachment B) will be completed and signed by the MPC E&I Foreman/Coordinator, Cable Pull Foreman, Tugger

Blanchard Refining Company LLC	Galveston Bay Refinery	
Title: Electrical Cable Pull Policy	Doc Number: RSW-000067-GB	Rev No: 0

Operator, Reel Tender, Signal Person, and/or Electrical Department Foreman or Designee (When Applicable).

- 3.2.4 **Heavy Pulls** require the Heavy Pull Plan (Attachment C) to be completed and submitted for approval prior to the date of the cable pull. In addition, a pre-pull walkdown to be performed, and the Intermediate Pull Checklist (Attachment B) will be completed and signed by the MPC E&I Foreman/Coordinator, Cable Pull Foreman, Tugger Operator, Reel Tender, Signal Person, and/or Electrical Department Foreman or Designee (When Applicable). The Heavy Pull Plan shall include:
- Detailed calculations for pulling tensions and allowable sidewall pressure for each cable pull segment.
 - Overall plot plan outlining of the cable pull showing its travel path with locations of the cable puller, roller, sheaves, and cable reel.
 - Manufacturer 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.
- 3.2.5 The Company performing the electrical cable pull is responsible for preparing the Heavy Pull Plan.
- 3.2.6 Accuracy of the pull load weight must be considered when developing the Heavy Pull Plan. An appropriate safety factor must be considered and applied by the competent person for the following:
- Distance of pull
 - Sling type, size, length, and capacity attached to the electrical cable being pulled
 - Pull line type and size
 - Use of swivels for attachment of pulling eye/grip and pulling line
 - Shackle type, size, and capacity attached to the rigging
 - Proper number and size of tray rollers and/or sheaves
 - Weight of cable
 - Number of bends in the raceway
 - Elevation changes
 - Weather conditions
 - Equipment grounding

Blanchard Refining Company LLC	Galveston Bay Refinery	
Title: Electrical Cable Pull Policy	Doc Number: RSW-000067-GB	Rev No: 0

These factors will determine the load placed on the Tugger being used for the pull and must be within the capacity of the manufacturer's specs for the tugging device. The maximum load **shall not** exceed 90% of the equipment's rated capacity.

- 3.2.7 A copy of the Intermediate Pull Checklist, Heavy Pull Plan, drawings, plot plans, rigging diagrams, and calculations shall be kept with the hard copy of the Safe Work Permit at the jobsite.

3.3 General Guidelines

- 3.3.1 If a power activated Tugger will be anchored to any equipment or pipe rack it shall be identified in the Rigging Diagram.
- 3.3.2 It is the MPC Foreman/Coordinator's responsibility to notify appropriate personnel at least 24 hours in advance of any Heavy pull to ensure all non-essential personnel are safely outside the pulling zone due to the line-of-fire and falling object hazards. All non-essential work within the cable pull zone as defined by the Heavy Pull Plan of the Intermediate Pull shall be halted.
- 3.3.3 The Company performing the electrical cable pull shall implement any necessary special instructions, procedures, or precautionary measures prior to initiating the cable pull and shall document this in the appropriate section of the Hand Pull with Rigging or Intermediate Pull Checklist.
- 3.3.4 No employee shall be permitted to position themselves directly beneath or in the line-of-fire of cables being pulled by any power-activated Tugger. Barricading is required if these locations cannot be monitored while a pull is executed.
- 3.3.5 Employees are not permitted to string lines through a roller block until the pulling device is de-energized.
- 3.3.6 If a Tugger 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. The tension meter shall be mounted remotely to avoid the line-of-fire.
- 3.3.7 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 Tuggers.
- 3.3.8 MPC Engineering, Maintenance, or Construction may reclassify any pull as a heavy pull.

3.4 Rigging

- 3.4.1 All rigging equipment utilized at GBR shall at minimum meet the requirements of ASME B30.5, OSHA 1926 Subpart CC, and all other applicable industry codes and standards.
- Reference *RSW-000039-GB EQ-13 RIGGING OPERATIONS PROCEDURE* for all requirements for rigging equipment

Blanchard Refining Company LLC	Galveston Bay Refinery	
Title: Electrical Cable Pull Policy	Doc Number: RSW-000067-GB	Rev No: 0

- 3.4.2 All slings made with synthetic material shall be made with nylon or polyester material and be a minimum of 2-ply slings. All synthetic slings within GBR excluding Alky units shall have a legible label consisting of white background with black font. Slings must be designed with a safety factor of five.
- 3.4.3 All alloy steel chains, wire rope slings with welded end terminations, or metal mesh slings shall have a certificate of proof test provided by the user or equivalent entity per requirements of 1910.184
- 3.4.4 All MPC rigging equipment will be obtained from the GBR Rigging Loft through a check out/in process.
- 3.4.5 All non-MPC owned rigging equipment shall be approved through the MPC HEO Rigging Supervisor.
- 3.4.6 Specialty or non-stock rigging equipment must be approved by the MPC HEO Rigging Supervisor prior to issue or use.
- 3.4.7 Alky Units require specific rigging.
- Reference RSW-000039-GB EQ-13 RIGGING OPERATIONS PROCEDURE for rigging requirements in Alky units.
- 3.4.8 Load ratings of all stringing lines, pulling lines, load-bearing hardware/accessories, and rigging and hoisting equipment shall never exceed the manufacturer's rated capacity. These ratings shall be documented in Heavy Pull Plan Attachment "C".
- 3.4.9 All rigging and rigging hardware will be inspected prior to use by a competent person. Any rigging or rigging hardware with visible defects will be removed from service or a Do Not Use tag applied.
- 3.4.10 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. These anchorage points are to be identified in the Rigging Diagram in Heavy Pull Plan Attachment "C".
- 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. Modifications to Points of Attachment is **prohibited**, unless reviewed and approved by appropriate engineer and documented.
 - Before anchoring and rigging or mechanical hoist equipment to live piping, MPC E&I Supervisor/Coordinator shall obtain approval from Operations and Engineering.
- 3.4.11 Reel handing equipment, including pulling and tensioning devices, shall be inspected in accordance with manufacturer's requirements by a competent person and confirmed in good working condition prior to use. All such equipment shall be secured and aligned prior to the start of any cable pulling activity.

Blanchard Refining Company LLC	Galveston Bay Refinery	
Title: Electrical Cable Pull Policy	Doc Number: RSW-000067-GB	Rev No: 0

3.4.12 Modifications of any Rigging equipment is **prohibited**.

3.5 Training

3.5.1 All personnel whose duties include rigging shall be a competent person trained in proper rigging techniques applicable to the work the individual is to perform.

3.5.2 All personnel who operate a power actuated Tugger shall be trained in the correct use and operation of the equipment.

3.6 Pre-Pull Walkdown

3.6.1 A pre-pull walkdown shall be completed within 24 hours before the pull.

3.6.2 The attendees will review the cable pull preparations, rigging checks, details of the job, and work plan to allow the Owning Department to prepare special operation/procedure/instructions or precautionary measures as needed. The attendees will also assess whether the stored energy of the cable pull is adjacent to operating lines, equipment, or buildings.

3.6.3 The following personnel shall attend the pre-pull walkdown:

- MPC E&I Foreman/Coordinator/Advisor
- Electrical Department Supervision or Designee
- Cable Pull Foreman
- Contractor Safety Representative
- Tugger Operator
- Reel Tender
- Signal Person

3.6.4 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.

4.0 ROLES AND RESPONSIBILITIES

4.1 MPC Foreman/Coordinator

4.1.1 Notifies appropriate personnel at least 24 hours in advance of any Heavy pull.

4.1.2 Supervises the personnel making the pull. Communicates all special instructions, procedures, or precautionary measures specific for the work area.

4.1.3 Leads the At the Site Assessment section of the Hand Pull with Rigging Checklist or Intermediate Pull Checklist and participates in the pre-pull walkdown.

4.1.4 Reviews and signs the Heavy Pull Plan, if necessary.

Blanchard Refining Company LLC	Galveston Bay Refinery	
Title: Electrical Cable Pull Policy	Doc Number: RSW-000067-GB	Rev No: 0

4.1.5 Determines when all preparations are complete and makes the decision when to initiate cable pull.

4.2 Cable Pull Foreman

4.2.1 Shall be in a position to view all cable pulling activities and coordinate ground personnel (if utilized) to observe the cable pulling activity from strategic points along the path of installation.

4.2.2 Arranges a communication system via two-way radio or by establishing a direct line-of-sight to allow everyone on the job a means to communicate conditions that may warrant immediate termination of the pull.

4.2.3 Ensures all non-essential personnel are safely outside the pulling zone.

4.2.4 Attends the pre-pull walkdown.

4.2.5 Ensures all permits and forms are signed prior to initiating cable pull. This is the job foreman for the company responsible for installing the cable.

4.3 Electrical Department Supervision or Designee

4.3.1 Reviews all associated documents for a Hand Pull with Rigging, Intermediate Pull, and Heavy Pulls on or for Transmission or Distribution equipment only.

4.3.2 Determines when a cable pull is an emergency and determines a path forward.

4.3.3 Participates in the pre-pull walkdown (for Transmission or Distribution work)

4.4 Contractor Safety Representative

4.4.1 Reviews all associated documents with Heavy Pull Plan.

4.4.2 Participates in the pre-pull walkdown.

4.4.3 Reviews and signs the Heavy Pull Plan.

4.5 Tugger Operator

4.5.1 Operates or tends hoists to lift and pull loads via a Tugger.

4.5.2 Participates in the pre-pull walkdown.

4.5.3 Reviews and signs the Intermediate Pull Checklist.

4.6 Reel Tender

4.6.1 Tends to cable reel.

4.6.2 Participates in the pre-pull walkdown.

4.6.3 Reviews and signs the Hand Pull with Rigging Checklist or Intermediate Pull Checklist.

4.7 Signal Person

4.7.1 Signals or verbally communicates with workers engaged in the cable pulling process to ensure safety of the crew and materials.

Blanchard Refining Company LLC	Galveston Bay Refinery	
Title: Electrical Cable Pull Policy	Doc Number: RSW-000067-GB	Rev No: 0

- 4.7.2 For personnel not within the site signaling view, communication via radio will be utilized in order to ensure proper security within blind spots.
- 4.7.3 Participates in the pre-pull walkdown.
- 4.7.4 Reviews and signs the Hand Pull with Rigging Checklist or Intermediate Pull Checklist.

5.0 DEFINITIONS

- 5.1 **Hand Pull** – Any electrical cable pull that does not utilize a power-activated Tugger. This pull will only involve feeding or pulling electrical cable by hand. Any pull can be classified as a Hand Pull provided the pull is performed using the hand-powered method.
- 5.2 **Intermediate Pull** – Any electrical cable pull that involves the use of a power-activated Tugger to pull an electrical cable that falls into the classification criteria listed in Table 1.
- 5.3 **Heavy Pull** – Any electrical cable pull that involves the use of a power-activated Tugger to pull an electrical cable that falls into the classification criteria listed in Table 1 – Pull Classifications.
- 5.4 **Competent Person** – One who can identify 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. Electrical personnel may be considered a competent person for cable pulling activities with proper experience and education.
- 5.5 **Pulling Tension** – The force exerted on the cable as it is pulled through the system. Tension on the Tugger or power-driven device shall be carefully monitored to prevent an unplanned event that could damage the cable or injure and employee.
- 5.6 **Tugger** – An electrical or pneumatic driven cable pulling machine.
- 5.7 **Sidewall Pressure** – The radial force exerted on a cable as it is pulled around a bend under pulling tension.
- 5.8 **Cable Pull Segment** – Cable routing between identified engineered pull points.

6.0 DOCUMENTS AND RETENTION

- 6.1 The documents associated with an electrical cable pull consist of Hand Pull with Rigging Checklist, Intermediate Pull Checklist, Heavy Pull Plans, Rigging Diagram, drawings, plot plans, and calculations. These documents shall be available to those planning the cable pull and shall be kept at the jobsite for review.
- 6.2 The original copy of the Heavy Pull Plan and associated documents and drawings shall be kept in the job as-built drawings.

Blanchard Refining Company LLC	Galveston Bay Refinery	
Title: Electrical Cable Pull Policy	Doc Number: RSW-000067-GB	Rev No: 0

6.3 After the job is completed, the Cable Pull Foreman shall submit the corresponding checklist or Heavy Pull Plan with the closed out Safe Work Permit.

7.0 ATTACHMENTS

7.1 [Attachment A: Hand Pull with Rigging Checklist](#)

7.2 [Attachment B: Intermediate Pull Checklist](#)

7.3 [Attachment C: Heavy Pull Plan](#)

8.0 REVISION HISTORY

Revision Number	Description of Change	Written by	Approved by	Revision Date	Effective Date
0	Original Issue under MOC 123936	F. Cazares	T. Champeaux	6/12/2023	6/29/2023