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1.0 INTRODUCTION

1.1 Purpose

The purpose of this document is to establish a procedure for the execution of an Assured Equipment Grounding Conductor Program (AEGCP) at the Anacortes Refinery.

1.2 Scope

The scope of this document applies to the following cord sets and cord & plug connected equipment.

- 480-Volt cord sets and portable cord & plug connected equipment that is owned, rented, or leased by MPC.
- Any other cord sets and portable cord & plugged equipment greater than 125-Volt single-phase, 15-, 20-, or 30-Ampere that are not protected by a Ground Fault Circuit Interrupter (GFCI) that is owned, rented, or leased by MPC.

Note: RSP-1162 states that "*GFCI protection shall be provided when an employee is outdoors and operating or using cord- and plug-connected equipment supplied by 125-Volt, 15-, 20-, or 30-Ampere circuits.*"

2.0 REFERENCES

2.1 Marathon Standards, Policies & Procedures

- RSP-1162-000, Electrical Safe Work Practices
- R-11-014, Red Tagging Chemical and Unsafe Equipment

2.2 Government Regulations

- OSHA 29 CFR 1910.304(b)(3)(ii)(C), Wiring design and protection

2.3 Industry Standards

- NFPA 70, National Electrical Code
- NFPA 70E, Standard for Electrical Safety in the Workplace

3.0 DEFINITIONS

The following definitions are applicable to this procedure.

Table 1 Acronyms

Term	Description
AEGC	Assured Equipment Grounding Conductor
AEGCP	Assured Equipment Grounding Conductor Program
GFCI	Ground Fault Circuit Interrupter

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The user of this document must ensure the current approved version of the document is being used.

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Table 2 Definitions

Term	Description
Controlled Access Location	An area that is locked with key(s) or Lenel access control, to only allow access by MPC authorized personnel or appointed Qualified Person.
Cord Sets	A piece of electrical equipment which is detachable from both the power supply and the electrical equipment and consists of a flexible cord with electrical connectors at either end (i.e., one "male", one "female"). Example: 480V flexible cords.
Covered Equipment	The use of the terms "covered equipment" and "equipment" in this document refer to cord sets and portable cord & plug connected equipment that is covered in Section 1.2 (Scope) of this document.
Portable Cord & Plug Connected Equipment	A piece of machinery or portable electrically powered device equipped with an electrical cord and/or plug(s). Example: welding machine, post weld heat treat equipment.
Qualified Person	A person who has demonstrated skills and knowledge related to the construction and operation of electrical equipment and installations and has received safety training to identify the hazards and reduce the associate risk.

4.0 ROLES AND RESPONSIBILITIES

4.1 Owner of AEGCP

The Maintenance Electrical group will own and manage the AEGCP. It is their responsibility for adherence to this document and ensuring proper inspection and testing of AEGCP covered equipment by a Qualified Person

4.2 Contractors

Contractors are responsible for implementing their own AEGCP that is in compliance with OSHA. The Contractor's AEGCP is subject to audit by MPC to ensure compliance.

4.3 Safety Department

The Safety Department will verify compliance with this program through field walks and formal audits as deemed necessary.

4.4 Refinery Personnel and Contractors using MPC owned, leased, or rented equipment covered by the AEGCP

Perform a visual inspection of the equipment daily or before each use. Do not use equipment if there is physical damage, expired or missing AEGCP tag, or any other indication that the safe use of the equipment may have been compromised. Contact the Maintenance Electrical Department if unsure about the physical condition of equipment. If equipment is deemed unsafe, return to the Maintenance Electrical Department immediately.

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4.5 Coordinators – TAR, Project, Maintenance, or Other

This AEGCP will be communicated out by any group bringing contractors onsite that will be performing work, thus ensuring the program is properly implemented. Any rented, leased, or owned equipment that coordinators bring into the plant, and which falls under the scope of this AEGCP, must be communicated to the Maintenance Electrical Department so the equipment can be properly added to the program.

5.0 AEGP MANGEMENT SYSTEM

5.1 Identification Requirements for Cord Sets and Equipment

All covered equipment in this AEGCP shall be marked with a unique number on a durable tag attached to the equipment.

A stainless-steel tag will be imprinted with this refinery’s identifier and equipment item number (e.g., ANA-0001).



Figure 1 Example of tag to be affixed to covered equipment

5.2 Issuing Covered Equipment for Use

When equipment is issued for use, the following information shall be documented in the Master AEGCP Equipment List found on the Maintenance SharePoint site:


- A. Name of MPC employee or Contractor employee checking out the equipment,
- B. If not MPC, then Contractor Company name,
- C. Supervisor’s name,
- D. Location where the equipment is expected to be put into service (e.g., process unit, shop, fab area, etc.), and
- E. Check-out date

Note: By signing for the equipment, the MPC employee or Contractor employee is acknowledging that they understand their responsibility to ensure the equipment is returned when the job is completed or re-inspected and tested prior to the due date listed on the tag.

5.3 Covered Equipment Inspection and Testing Requirements

The following Inspection and Testing requirement shall be established for all covered cord sets and equipment.

- A. Inspection and testing per this document shall be performed by Qualified personnel as follows:

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- Before first use on-site,
- When there is evidence of damage,
- Before equipment is returned to service following any repairs, and
- At intervals described below.

B. Inspecting and Testing shall be conducted on the following intervals:

- When covered equipment is first put in service and at intervals not exceeding 3 months if the equipment continues to be in use in the field.
- Covered equipment that is readily available for use must also be inspected and tested at intervals not exceeding 3 months.
- Covered equipment stored in a controlled access location "not available for use" is not required to be inspected every three months. Covered equipment in this controlled access location must be inspected prior to issuing.

C. Inspecting and Testing Requirements:

- Prior to testing, all covered equipment shall be inspected for obvious damage to the visible parts of the equipment including outside insulation, cord ends, metal housing, etc.
- All covered equipment grounding conductors shall be tested for continuity and shall be electrically continuous. This test shall be performed with an Ohmmeter, and resistance checked between cord ends or cord end and equipment. The maximum resistance shall be determined by the size and length of wire or cable. For standard 60-amp or 100-amp cords sets 100 feet or less, the resistance shall be 2-ohms or less.
- When testing tools or cord & plug connected equipment, test the resistance between the attachment plug/pin to the exposed metal case or frame.
- Each receptacle and attachment plug shall be tested for correct attachment of the equipment grounding conductor. The equipment grounding conductor shall be connected to its proper terminal.
- Insulation Resistance shall be checked between all terminals with a 500-volt Meg-ohmmeter and the minimum resistance shall be 100-meg-ohms between any two terminals.
- All covered equipment in use in the field shall be inspected daily for obvious damage. No documentation is required for this daily field inspection.

D. Documentation of Covered Equipment Inspection and Testing

- If the equipment passes all inspections/test and is deemed "approved for use", an Impact tag with the "due-date" shall be attached near the stainless-steel AEGCP item number tag. For cord sets, attach a "due-date" Impact tag on both ends of the cord set.

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Figure 2 Example of “due date” tag to be affixed to covered equipment

Note: The “due date” will be the date that is three months after the test date listed in the record/log book.


- Documentation for equipment issued for use shall be kept until the next inspection (3 months).
- Recurring SAP PMs will initiate the quarterly inspection and testing of all covered equipment. Covered equipment inventory, inspection & testing, and equipment check-out will be tracked on the *Master AEGCP Equipment List*, which can be found on the Maintenance Electrical SharePoint site.
- Every effort must be made to locate lost AEGCP equipment. Lost equipment will be listed on the *Master AEGCP Equipment List* as lost and the assigned unique AEGCP item number will not be re-used for new equipment.
- Covered equipment placed into long-term storage shall meet the requirements of Section 5.5.2 and can retain its assigned unique AEGCP number (ex. ANA-0001), but it shall be noted on the *Master AEGCP Equipment List* that the equipment has been placed in long-term storage and is not available for immediate use.

E. Covered Equipment Inspection, Testing, and Returned Equipment Handling Area Requirements

- The AEGCP equipment storage areas are controlled access locations, controlled by the Maintenance Electrical Department. There are three areas to the AEGCP equipment storage: (1) Electrical Storage: an area that includes equipment that is active in the AEGCP and has passed inspection and testing requirements, (2) Electrical Storage: an area for returned equipment that has not been inspected and tested, and/or has failed inspection and testing, and (3) Shop 3: long-term storage for equipment that is not regularly used and have been removed from the AEGCP (ex. Equipment only used during shutdowns/TARs).

Note: The Electrical Storage building is located off Art Spanski Way on the north side of the Garage. Equipment that has not been tested or has failed testing will be locked in the provided storage racks to prevent inadvertent use of equipment.

- If covered equipment is to remain in storage for extended periods, the equipment shall be red-tagged per R-11-014, Red Tagging Chemical and Unsafe Equipment. On the red tag, write the following under the **Unsafe Condition**: “Removed from AEGCP. Do not use until placed back into AEGCP”.

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6.0 REVIEW AND REVISION HISTORY

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0	Mark Willand	12/12/2021	Reformatted and Numbered per Document Control Policy, R-63-001.

7.0 APPENDIX A – EXAMPLE AEGCP EQUIPMENT LIST

MASTER AEGCP EQUIPMENT LIST <small>Reference SR-77 for AEGCP details</small>																		
EQUIPMENT AEGC #	EQUIPMENT TYPE	DATE OF INSPECTION/TEST	END CONTINUITY TEST RESULTS (S)	INSPECTION & TESTING							CHECK-OUT					COMMENTS		
				TEST RESULTS							APPROVED FOR USE? (Y/N)	CHECKOUT DATE	LOCATION	NAME OF EMPLOYEE	COMPANY OF EMPLOYEE		EMPLOYEE'S SUPERVISOR	
				AS-900	BS-900	GS-900	AS-50	BS-50	GS-50	GS-40								
ANA-0001																		
ANA-0002																		
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