

BP OIL -- TOLEDO REFINERY

Certified	Refinery Wide	Procedure No.: SAF 097
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SCOPE	This procedure is to provide guidelines and requirements for the use of temporary power at the BP Oil Toledo Refinery.
HEALTH Special PPE & Special Hazards	Standard Electrical PPE such as high voltage gloves and Flash Suits.
SAFETY	Protection from Electrical hazards including Shock, Arc and Blast
REFERENCE DOCUMENTS	NFPA 70E OSHA 1910 National Electrical Code NFPA 70.
SPECIAL MATERIALS & EQUIPMENT	N/A
QUALITY	N/A
ENVIRONMENTAL	N/A

OVERVIEW

Temporary Electrical Power is required at the BP Oil Toledo Refinery during times of construction, emergencies, maintenance or demolition. Electrical Hazards are recognized as one of the most common causes of injury or fatality on construction or industrial sites. This procedure is written to ensure minimum standards are provided and used to minimize the risks of temporary electrical power.

1.0 Definitions

- **Electrical Hazard** – A potential source of personal injury, either directly or indirectly caused by an electrical energy source. The hazards include shock, blast, burns, arc flash or fire.
- **Electrical Supervisor** – BP Oil Electrical Engineer, E & I Shop Supervisor or E & I Field Supervisor.
- **Energized** – Electrically connected to or having a source of voltage.
- **Exposed** – Capable of being inadvertently touched or approached nearer than a safe distance by a person. Applies to parts not suitably guarded, isolated or insulated.
- **Portable Utilization Equipment** – Electrical equipment that is cord and plug connected and intended to be moved during normal use. Examples include electric hand tools such as drills, grinders and handlamps.
- **Temporary Installation** – Electrical disconnects, switches, transformers, panelboards, switchracks and/or cables that are installed to provide power for a specific purpose and temporary time duration.

2.0 Temporary Installations

- The Management of Change (MOC) process shall be used for all temporary installations that include power to process equipment.
- Temporary installations, other than trailers, are generally limited to 90 days. This duration can be extended for specific needs such as maintenance, repairs or process requirements. This duration should be discussed during the MOC.
- All stationary equipment that is part of a temporary

installation shall be approved for the area classification in which they are installed unless a MOC and hazard review is completed.

- Portable utilization equipment can be general purpose as long as a valid hot work permit is issued and the equipment is powered down when not in use.
- All temporary installations shall meet the latest edition of the National Electric Code. Installations are to be made in a temporary manner but with safe and neat workmanship.
- All temporary installations shall be grounded.
- All temporary installations shall be properly labeled.
- An Electrical Supervisor shall approve the power source of all temporary installations.
- Open splices are not permitted.
- All conductors shall be in multiconductor jacketed cable assemblies or encased in conduit.
- Single conductors are not permitted unless encased in conduit.
- Temporary installations shall be removed after their use is complete.

3.0 Portable Electric Equipment & Flexible Cord Sets.

- All 125 volt, single phase receptacle outlets, cord sets and equipment that are not part of the permanent wiring shall be ground fault circuit interrupter (GFCI) protected for personnel protection.
- An approved ground fault interrupter (GFCI) device must be used in each circuit supplying power to the equipment. The GFCI shall be the first device from the power source. A valid hot work permit must be issued in the area of the GFCI if it is not rated for the area classification.
- The GFCI shall be tested before each shift.
- Portable cord sets or devices incorporating listed ground fault circuit interrupters for personnel protection shall be identified for portable use.
- A portable GFCI is not required if the permanent receptacle or circuit breaker is GFCI protected.
- All flexible (extension) cords shall be of the three wire grounding type. Attachment plugs and receptacles may not be connected or altered in a manner that would prevent proper continuity of the equipment grounding conductor.

- All equipment and cords shall be of high quality, industrial grade construction and shall be NEC listed for “hard usage” and/or “extra hard usage.” The outer jacket must be complete with no damage marks. This does not apply to office related devices.
- Portable electric equipment and flexible cords that are left unattended and in use longer than one shift and are used where employees are likely to contact water or conductive liquids shall have a stamp of approval for those locations from UL or a similar authority. This type of connection has an overlapping rubber seal to prevent moisture from entering the connection.
- Extension cords shall be protected from accidental damage. Care should be taken to assure that they do not come in contact with steam, condensate or hot process piping. Sharp corners and projections shall be avoided. When passing through doorways, pinch points or across aisle ways or roads, protection shall be provided to avoid damage. A cord should not be routed in a way that it blocks access to foot or vehicular traffic.
- All attempts should be made to keep temporary cords suspended above grade to minimize tripping hazards and prevent them from lying in water.
- Portable cords and plug connected equipment and flexible cord sets (Extension cords) shall be visually inspected before use on any shift for defects. Cord and plug connected equipment which remains in a fixed position, and not exposed to damage need not be visually inspected until they are relocated.
- Defective or damaged item shall be removed from service and no employee shall use it until repairs and tests are completed to make the equipment safe for use.

4.0 Temporary Lighting

- Quartz lights are not permitted in the refinery process units. The only acceptable use is in a non process area such as a building for general construction.
- Temporary lighting in hazardous locations shall be approved for the area in which they are installed.
- Temporary lights shall be GFCI protected.
- Temporary string type lights used in a process vessel shall be protected from accidental contact or damage.

A metal cage shall not be the only means of protection. A hot work permit for inside the process vessel shall be issued prior to energizing the string lights.

5.0 Assured Equipment Grounding Conductor Program (480 volt equipment only)

- All 480 Volt temporary cord sets, receptacles and temporary equipment that are not protected by a GFCI shall part of the BP Toledo Assured Equipment Grounding Program.
- The following tests shall be completed during the inspection of the equipment:
 1. All equipment grounding conductors shall be tested for continuity and shall be electrically continuous.
 2. Each Receptacle and attachment cap or plug shall be tested for correct attachment of the equipment grounding conductor. The equipment grounding conductor shall be connected to its proper terminal.
 3. The receptacle pins and sockets shall be inspected for damage or missing parts.
 4. The flexible cords shall be inspected for damage to the outer jacket such as cuts, crushed or pinch points.
 5. Enclosures shall be opened and inspected for possible internal damage. Verify the grounding conductor is attached to any metal enclosures.
- All required tests shall be performed whenever:
 1. Before the equipments first use.
 2. Before the equipment is returned to service following any repairs.
 3. Before equipment is used after any incident which can be reasonably suspected to have caused damage.
 4. At intervals not to exceed 3 months, except that cord sets and receptacles which are fixed and not exposed to damage shall be tested at intervals not exceeding 6 months.

- A tagging system shall be used to document the date of the previous test and when equipment must be taken out of service for re-inspection. The tag shall be attached to the equipment indicating who inspected it, when it was inspected and the next due date.

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