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| <p><u>CNS OPERATIONS MANUAL</u> ADMINISTRATIVE PROCEDURE 0.36.7 ELECTRICAL CORD CONTROL/GFCI PROGRAM</p> | <p>USE: INFORMATION QUALITY: QAPD RELATED EFFECTIVE: 3/8/11 APPROVAL: ITR-RDM OWNER: SHU SUPV DEPARTMENT: SHU</p> |
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| REV. | DATE | CHANGES |
|------|--------|--|
| 4 | 2/1/11 | Moved cord control information previously found in Procedure 7.3.61 to this procedure. Provided clarification of instructions in various sections of procedure. |
| 5 | 3/8/11 | Added a requirement (new Step 2.5) to perform a Job Safety Hazard Analysis if there is a variance to this procedure. Provided clarification of instruction in various sections of the procedure. |

1. PURPOSE

1.1 The purpose of this procedure is to provide requirements for the Ground Fault Interrupter Program, the use of electrical extension cords for maintenance activities, the use of extension cords for convenience activities, and inspection criteria for using electric power tools and extension cords.

2. DISCUSSION

2.1 It is the responsibility of all personnel that use electric power tools and/or extension cords to ensure the equipment is in good working order.

2.2 Extension cords are in two general categories. Cords for maintenance activities and cords for convenience activities.

2.2.1 Maintenance activities are those that require an extension cord to supply power to electric power tools, portable lighting, test equipment, etc.

2.2.2 Convenience activities are those that require an extension cord to supply power to a component (radio, microwave oven, lamp, computer, etc.) that is not close to an installed receptacle.

- 2.3 All electrical cords must be controlled to ensure the installation is per approved standards.
- 2.4 A Ground Fault Circuit Interrupter (GFCI) is a device intended for the protection of personnel that functions to de-energize a circuit or portion thereof within an established period of time when there is an imbalance of current between the hot and neutral conductor of a given circuit. This device is designed to protect personnel against electrocution. Ensure the GFCI has the correct amperage rating for the task at hand. If the GFCI trips, reset it once, but if it trips again, remove the circuit from service until the problem in the circuit is identified and corrected.
- 2.5 Deviations from requirements listed in this procedure will require an approved Job Safety Hazard Analysis per Procedure 0.36.12.

3. CORD CONTROL/GFCI INSTRUCTIONS

3.1 Responsibilities for Cord Control/GFCI Program:

3.1.1 Employees obtaining electric tools or cord sets shall inspect them prior to use.

3.1.1.1 If defective electric tools or cord sets are discovered, they shall be removed from service.

3.1.2 Tool Crib, Electric Shop, and IAC personnel shall maintain electric tools and cord sets.

3.1.3 Supervisors are responsible for ensuring:

3.1.3.1 Electrical extension cords used in their areas are inspected periodically.

3.1.3.2 Convenience cords used in their areas have a Temporary Power Tag (Attachment 1 or similar) attached identifying the date of installation and cognizant point of contact, by name, responsible for the extension cord.

3.2 Portable electric power tools shall be double-insulated or effectively grounded by means of a three-wire cord and grounding plug.

3.3 All extension cords shall be effectively grounded by means of a three-wire cord and grounding plug.

3.4 All portable electric power tools and extension cords should be connected to a GFCI.

3.4.1 GFCI can be omitted if test equipment will not operate and test equipment is known safe.

3.5 Portable electric tools should be inspected:

3.5.1 Before and after each use;

3.5.2 After repairs and before being returned to service; and

- 3.5.3 Before being used after any accident/incident which is suspected of damaging the tool.
- 3.6 The inspection criteria for portable electric tools are:
 - 3.6.1 Tool is in good physical condition (i.e., case is in good condition, all guards and features are in place and functional).
 - 3.6.2 Tools that are not double insulated must have the case connected to the system ground through the grounding plug.
- 3.7 Extension cords should be inspected for:
 - 3.7.1 A visual inspection should be made of extension cord each time it is used. Cords with cracked or worn insulation or damaged ends should be removed from service immediately. Cords with grounding prong missing or cut off must also be removed from service.
 - 3.7.2 Extension cords should be of continuous length with no splices.
 - 3.7.3 Extension cords should be water-tight throughout their entire length, except for prongs at ends (i.e., insulation jacket must be fully intact).
 - 3.7.4 Amperage ratings of extension cords should be at least equal to the demands placed upon it.
- 3.8 Extension cords or power tool cords are not to be used to raise or lower tools/equipment from scaffolding, etc.
- 3.9 Fabricated extension cords (cords with junction boxes or other non-factory ends attached) are prohibited.
- 3.10 Cords should be protected or elevated when passing through areas where personnel or vehicular traffic is expected.
- 3.11 Cords are not to pass through fire doors without appropriate authorization.
- 3.12 Extension cords shall not be draped over hot surfaces such as steamlines, space heaters, or other hot sources.
- 3.13 Extension cords shall not be fastened with staples, hung from nails, or suspended with wire.
- 3.14 Temporary lights shall be equipped with guards to prevent accidental contact with the bulb and not suspended by their electrical cord unless so designed.
- 3.15 If a cord is found to be warm to the touch, disconnect from power source and contact Electric Shop immediately.
- 3.16 Avoid running extension cords through standing water, on wet floors, or other wet areas.

- 3.17 Extension cords and electric power tools should be disconnected and neatly stored when not in use.
- 3.18 Electrical extension cords should not be used as a permanent extension of the building's fixed electrical system for > 90 days. When electrical extension cords will be required for > 90 days or an extension cord has been in place for > 90 days, perform the following:
 - 3.18.1 Write a Condition Report to evaluate installation of permanent wiring.
 - 3.18.2 Write a separate Condition Report with a recurring action at 90 day intervals to inspect electrical extension cords per Step 3.7. Action shall be assigned to group/individual requiring the use of the extension cord.

4. EXTENSION CORDS FOR MAINTENANCE ACTIVITIES

- 4.1 Electrical extension cords used to support maintenance activities, remodeling, and repairs may be used for the entirety of the work activity, and shall be removed when work is completed. These cords are not required to be tagged.
- 4.2 Extension cords shall be installed in a manner that will not be hazardous to personnel.
- 4.3 Extension cords shall not be daisy chained (i.e., multiple cords plugged into one another) except for those controlled per Procedures 7.3.61 and 7.3.61.1.
- 4.4 Install extension cords in a manner that will not violate electrical separation criteria for RPS, PCIS, engineered safety features, and other Class 1E safety-related electrical equipment.
 - 4.4.1 An extension cord, drop light, or temporary lighting string shall not be associated with (attached to or draped over) two safety-related redundant electrical divisions, equipment trains, or logic channels.

5. TEMPORARY EXTENSION CORDS FOR CONVENIENCE

- 5.1 Convenience cords are authorized providing they meet the following:
 - 5.1.1 Convenience cords are approved for use if there are no acceptable alternatives such as:
 - 5.1.1.1 Moving the component to be powered closer to the receptacle.
 - 5.1.1.2 Relocating the receptacle closer to the component.
 - 5.1.2 Convenience cords are tagged using the Temporary Power Tag from Attachment 1 (or similar).
 - 5.1.2.1 Tags are available at the Tool Cribs, Electric Shop, and IAC Shop.
 - 5.1.3 Approved convenience cords will be logged using Attachment 2 (or similar).

5.1.4 Convenience cords shall be installed by the Requester/User using the guidance in Section 3.

6. SURGE PROTECTORS/POWER STRIPS

NOTE – Surge protectors are designed to provide protection to electronic equipment from surges in the supplied power that may damage the equipment.

6.1 Surge protectors are **NOT** designed to be used as extension cords and shall **NOT** be used in that manner.

6.2 Power strips, that follow the guidelines below, are not controlled by this procedure.

6.2.1 Power strips are designed for use with a number of low powered loads such as computers or audio visual equipment.

6.2.2 Power strips are not to be used for high power loads such as space heaters, refrigerators, or microwave ovens.

6.2.3 Power strips shall be connected to a permanently installed receptacle.

6.2.4 Power strips shall not be connected to other power strips or extension cords.

6.3 Power strips used in any other manner than described in Step 6.2 shall not be used.

7. RECORDS

7.1 No quality records are generated by this procedure.

8. REFERENCES

8.1 COMMITMENTS AND OBLIGATIONS MATRIX

| COMMITMENTS AND OBLIGATIONS | AFFECTED STEPS |
|-----------------------------|----------------|
| QAPD | None |

8.2 CODES AND STANDARDS

8.2.1 National Electrical Code.

8.2.2 Supervisor's Safety Manual - National Safety Council.

8.2.3 USDOL OSHA - 1926.404.

8.3 UPDATED SAFETY ANALYSIS REPORT

8.3.1 Section VII-1.7.3.1, Criteria for Preserving the Independence of Redundant Channels.

8.4 PROCEDURES

8.4.1 Administrative Procedure 0.5.CR, Condition Report Initiation, Review, and Classification.

8.4.2 Administrative Procedure 0.36.12, Job Safety Hazards Analysis (JSHA).

8.4.3 Maintenance Procedure 7.3.61, Temporary Power.

8.4.4 Maintenance Procedure 7.3.61.1, Reactor Building Temporary Power Installation and Removal.

8.5 MISCELLANEOUS

8.5.1 CNS Industrial Safety Handbook.

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TEMPORARY
ELECTRICAL CORD

Name: _____

Installation Date: _____

Phone #: _____

Temp Cord Log #: _____

SAMPLE TAG

