



maintenance bulletin

SUBJECT: Maintenance of Electrical Switchgear

DATE: December 30, 1981

NO.: MMO-26-82

- TO: 1. Regional General Managers
Maintenance Management Divisions
2. District Offices
3. Sectional Center Facilities
4. Area Maintenance Offices
5. Bulk Mail Centers
6. Regional Safety Managers

The purpose of this bulletin is to reemphasize safety requirements for maintenance of electrical switchgear. The following are excerpts from" MS-1, Operation and Maintenance of Real Property. Because of the dangers involved in switchgear maintenance, each maintenance supervisor must become familiar with the following requirements and assure that personnel doing electrical maintenance understand and comply with them.

9-204 WORK ON SYSTEMS AND EQUIPMENT

No USPS employee shall perform work on any energized power circuit where the voltage to ground exceeds 50 volts. This does not preclude testing performed by qualified electricians. If special conditions prohibit the de-energizing of the lines or equipment, the job shall be contracted. (See appendix 9-A for minor exceptions). Before working on de-energized lines and equipment, the electricians shall padlock the switch in an open position and personally attach to the opened switch Form 4811, Danger Tag, figure 9-1, when the voltage involved is less than 600 volts, or a Form 4812, Keep Out Tag, figure 9-2, when the voltage involved is 600 volts or higher. Two or more men experienced in high voltage work shall be present at all times, when work is in progress, if the voltage of the systems or equipment being worked on exceeds 600 volts.

APPENDIX 9-A - GENERAL GUIDE FOR ELECTRICAL EQUIPMENT MAINTENANCE

1. STANDARD WORK PRACTICES - ELECTRICAL EQUIPMENT

a. Basic Requirements

Work shall not be performed by USPS employees on circuits or equipment unless they have first been de-energized. If special conditions prohibit the de-energizing of the circuit or equipment, the job

U. S. POSTAL SERVICE

DANGER

MAN WORKING ON THIS APPARATUS DO NOT OPERATE

LOW VOLTAGE USE ONLY (BELOW 600 VOLTS)

Signed _____

Building _____ Date _____

Any person operating apparatus in which this tag is attached will be subject to administrative action. This tag is to be used only by an authorized person. In every case, tag must be signed by foreman of crew. Upon completion of the work, tag MUST be removed by SAME PERSON who placed it.

DO NOT OPERATE

INSTRUCTIONS TO FOREMEN AND WORKMEN

All employees who inspect, clean, or repair power machines, tools, equipment, or appliances where electricity is used must comply with these instructions:

- (1) Notify person in charge, foreman, or operator that work is to be done on the equipment.
- (2) Protect equipment and workmen by placing tag on control apparatus, and removing fuses, or by taking any other precautions necessary to insure safety to workmen or equipment during the period while work is in progress.
- (3) Upon completion of work, remove tag and notify all persons that service can be restored.

PS Form 4811 May 1974

Figure 9-1. DANGER TAG

U. S. POSTAL SERVICE

HIGH VOLTAGE EQUIPMENT LOCKOUT TAG

HIGH VOLTAGE USE ONLY (600 VOLTS AND ABOVE)

KEEP OUT

Building _____ Date _____

H. T. Forder No. _____ Volt No. _____ Transformer No. _____

Purpose of Outage _____

CLEARANCE PROCEDURE

Power Dispatcher Notified Before, Time _____ a. m. _____ p. m.

Circuit Breaker Opened, Time _____ a. m. _____ p. m.

Power Dispatcher Notified After, Time _____ a. m. _____ p. m.

Clearance by _____
Chief or Assistant Chief Electrician

Electrician in Charge

RESTORATION PROCEDURE

Work Completed, Time _____ a. m. _____ p. m. Date _____

All Workmen Cleared, Time _____ a. m. _____ p. m.

Clearance by _____
Electrician in Charge

Chief or Assistant Chief Electrician

Power Dispatcher Notified Before, Time _____ a. m. _____ p. m.

Circuit Breaker Closed, Time _____ a. m. _____ p. m.

Power Dispatcher Notified After, Time _____ a. m. _____ p. m.

NAMES OF WORKMEN

CAUTION: Electricians must have read the applicable safety regulations which are printed in each workgroup item and transformer vault before proceeding with any work on high-voltage equipment.

NOTE: All tags shall be kept on file in the Maintenance Office for one year.

PS Form 4812, May 1974

Figure 9-2. KEEP OUT TAG

shall be contracted to a public utility or other firms having the specially trained, experienced, and equipped personnel to perform the work safely. However, USPS employees may work on energized circuits when:

- (1) Line voltage, current, and similar tests are made by experienced electricians with proper instruments.
- (2) The cutting lines are necessary in an emergency where there is no other means of disconnect, and proper emergency equipment is used.
- (3) Fuses are replaced by means of proper fuse pullers in circuit of 150 volts or less.
- (4) Low-voltage switching and disconnecting is performed, or high-voltage switching and disconnecting is

performed. For purposes of electrical equipment maintenance, low voltage is less than 600 volts and high voltage is 600 volts or higher.

- (5) Contract personnel are not obtainable, in special situations, and it is necessary to maintain power on the system. In such situations, the building manager shall authorize each job on an individual basis and the following precautions shall be observed:

- (a) All work shall be performed by qualified personnel who are familiar with the National Electric Code and other applicable codes.
- (b) All energized parts and personnel shall be effectively guarded by the use of protective equipment, such as rubber gloves, rubber blankets and floor mats, hotline tools, switchsticks, and testing and grounding devices to protect persons or objects from harmful contact.
- (c) All protective equipment provided for use on energized lines or equipment shall be periodically examined, tested and kept in a safe condition. Safety glasses shall always be worn when working on energized circuits.

b. Locking and Tagging

- (1) No person or crew shall perform work on or in close proximity to a circuit until:
 - (a) The circuit is properly de-energized.
 - (b) The foreman, leadman, or senior workman on the job has signed and personally locked the switch open and attached one Form 4811 (when the voltage is less than 600 volts) or Form 4812 (when the voltage involved is 600 volts or higher). The placing and removing of these tags cannot be delegated to any person.
 - (c) He has personally tested the circuit at the point of work to positively ascertain that the circuit is dead.
 - (d) All precautions are taken to prevent accidental or premature energizing of the circuit.
- (2) The tags indicated in (1)(b), above, shall remain in place until removed by the person who attached them.

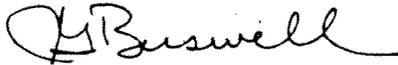
- (3) No person shall close a switch until all Danger and Keep Out Tags have been removed by the person who attached them.
- (4) The lock shall not be removed by anyone except the man who placed it there and not until all persons are clear of the circuit and all Danger and Keep Out Tags have been removed.
- (5) In the event that the above mentioned senior workman is unavailable or unable to remove his tag and lock, and emergency or extenuating circumstances require that the circuit be restored, the tags and locks may be removed only by that senior workman's next direct supervisor. The supervisor shall ascertain that all of the workcrew members are removed from the circuit and clear and that the circuit is clear. The supervisor must also confer with and obtain agreement from the USPS building manager or postmaster prior to removing these tags and locks.

c. Precautions Prior to Beginning Work

- (1) Each employee shall make certain that he is familiar with the equipment to be worked on and understands and follows the foreman's instructions concerning the work to be done.
- (2) A complete survey of existing hazards shall be made and all necessary precautions and safeguards taken to provide for self-protection and protection of other workmen and equipment. The employee shall consult with his supervisor when in doubt concerning proper safety measures.
- (3) Safeguards such as danger signs, roped-off space, barriers, etc., to protect others shall be used where the nature of the work requires it.
- (4) No work shall be done near high-voltage lines, cables, or apparatus until specific safety instructions are obtained from the foreman.
- (5) No electrical apparatus of any kind shall be cleaned until the equipment is de-energized and out of service.

MS-28, Maintenance of Electrical Switchgear, Part 2, Safety, contains basically the same information as Appendix 9-A of MS-1. It contains reference to the lockout device used in equipment lockout (see Maintenance Bulletin MMO-38-81, Safety Equipment Lockout, for more information on that subject).

MTSC is seeking information that will enable evaluation of switchgear maintenance by USPS personnel. What is needed is information on employee training and qualification, test equipment, protective equipment and protective equipment testing. We are also studying contract maintenance and preparing standard switchgear maintenance specifications. Any Maintenance Manager who has developed local plans for any of these elements is encouraged to contact Maintenance Technical Support Center; P.O. Box 1600; Norman, OK 73070, or FTS 743-8252.



J. G. BUSWELL
Acting Director
Maintenance Technical Support Center
Office of Maintenance Management

NOTE: The Maintenance Manager or the Senior Maintenance Official is to provide a copy of this bulletin to the facility Safety Manager/-Specialist.