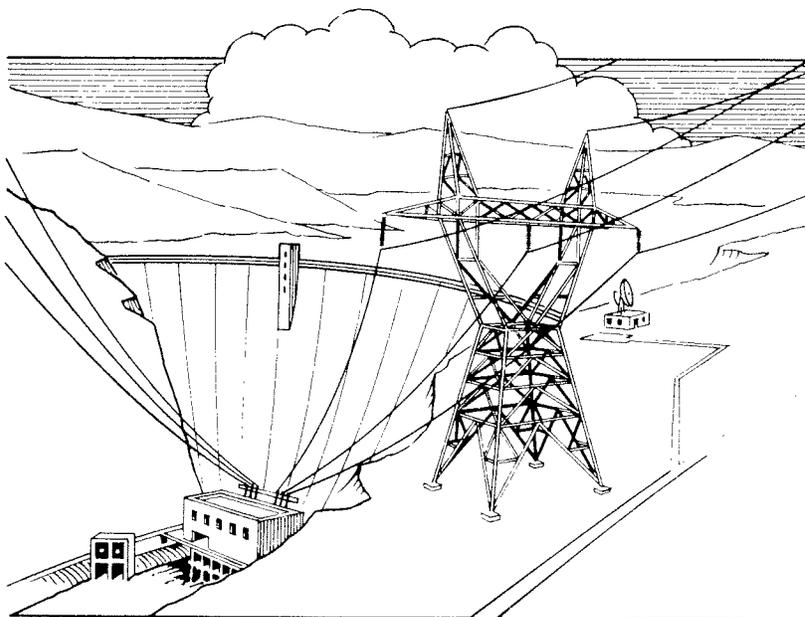


# POWER SYSTEM CLEARANCE PROCEDURE

July 1982

Bureau of Reclamation  
Power O&M Bulletin No. 26

Western Area Power Administration  
Power System Operations Manual  
Chapter 1



United States  
Department of Energy  
Western Area Power Administration  
Golden, Colorado



United States  
Department of Interior  
Bureau of Reclamation  
Denver, Colorado



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# POWER SYSTEM CLEARANCE PROCEDURE

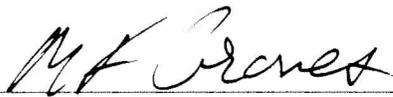
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Power O&M Bulletin No. 26

Western Area Power Administration  
Power System Operations Manual  
Chapter 1

This revision has been prepared by the Joint  
Bureau of Reclamation/Western Area Power Administration  
Task Force, with input and comments from the  
Five Region/Area Interface Task Groups and the  
Bureau's Pacific Northwest and Southwest Regions.

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7/9/82

United States  
Department of Energy  
Western Area Power Administration  
Golden, Colorado



United States  
Department of Interior  
Bureau of Reclamation  
Denver, Colorado



# PREFACE

On October 1, 1977, Public Law 95-91 transferred the power marketing and transmission functions of the Bureau of Reclamation to the Department of Energy. On December 21, 1977, the Western Area Power Administration was established within the Department of Energy to carry out these functions.

On November 6, 1979, the Bureau of Reclamation was renamed the Water and Power Resources Service. On May 20, 1981, the name was changed back to Bureau of Reclamation.

An agreement was signed on March 26, 1980, by the Commissioner, Water and Power Resources Service, and the Administrator, Western Area Power Administration, concerning the transfer of functions and property, and defining each agency's responsibility with respect to that part of the Federal power system referenced in Public Law 95-91.

In accordance with Exhibit F, paragraphs W and X, of the above agreement, a Joint Task Force was established on May 27, 1980, to develop a single clearance procedure document for both agencies, with the assistance of Joint Operations Coordination Teams from each of the five Region/Area interfaces.

This revision of Power O&M Bulletin No. 26 incorporates the recommendations of the Region/Area coordination teams, modified and edited by the Joint Task Force.

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## I. INTRODUCTION

**1.1. PURPOSE** The purpose of this Bulletin is to establish coordinated and consistent clearance procedures for the safe and reliable operation and maintenance of those portions of the Federal power system for which the Bureau of Reclamation (Bureau) and the Western Area Power Administration (Western) are responsible. These procedures include Clearances (Section V), Hot Line Orders (Section VI), Special Conditions (Section VII), and Danger Tags (Section VIII).

**1.2. SCOPE** This Bulletin establishes guidelines and broad operating criteria which shall be complied with throughout the Bureau and Western. It is recognized that due to the varying size and complexity of its powerplants, it may be necessary for the Bureau to develop specific written Regional or Project procedures within the guidelines of this bulletin. It is further recognized that it may be necessary to jointly develop specific procedures at the Region/Area level in order to implement the requirements of this Bulletin.

### 1.3. REFERENCES

- Reclamation Instruction, Series 250, "Power Operation and Maintenance."
- Section 302 of Public Law 95-91, the Department of Energy Organization Act, dated August 4, 1977.
- Agreement on Transfer of Facilities Between Water and Power Resources Service and Western Area Power Administration, dated March 26, 1980.

**1.4. RESPONSIBILITY OF THE BUREAU** The Bureau has responsibility for planning, designing, constructing, operation, and maintenance, including administration of safety procedures, of hydro and other forms of electrical power generation, and pumping facilities as authorized by the Congress. The Bureau also has responsibility for water release scheduling and for operational control of all generator units.

**1.5. RESPONSIBILITY OF WESTERN** Western has responsibility for planning, designing, construction, operation, and maintenance of the transmission system, marketing the Federal power and setting power rates to assure that revenues are sufficient to accomplish repayment of all the allocated investment. Western is also responsible for power system dispatch functions including assignment of load to specific generating stations and other sources of supply, within water and operating constraints set by the Bureau. Western is responsible for the operation

and maintenance of high-voltage lines, substations, and related transmission system equipment, including administration of safety procedures; the operation of principal tie lines and switching; the scheduling of energy transactions with connecting utilities; and the transmission, switching, wheeling arrangements, and substation service for delivering project power as required by the Bureau.

**1.6. REVIEW AND REVISION** This Bulletin will be reviewed annually by both the Bureau and Western to assure that the guides and procedures herein are adequate for the safe and reliable operation and maintenance of the joint power system. Proposed revisions will be jointly reviewed and agreed upon prior to publishing and implementing a revised Bulletin. Likewise, Region/Area procedures will be jointly reviewed annually to assure conformity with this Bulletin.

**1.7. INTERPRETATIONS** The stated interpretations for the following words shall be applied throughout this Bulletin:

- "May" - Permissive choice
- "Must" - Mandatory
- "Shall" - Mandatory
- "Should" - Advisory
- "Will" - Mandatory, but allowing the responsible employee or party some discretion as to when, where, and how.
- As used in this bulletin the pronouns, "He," "His," and "Himself" refer to a specific individual or position, which might be, "She," "Her," or "Herself" in a given circumstance.

**1.8. EMERGENCIES** In an emergency, Authorized Personnel may modify or suspend any of these guides temporarily as may be considered necessary to permit proper handling of the specific emergency. However, in handling such emergencies, safety of personnel shall be given paramount consideration.

**1.9. PHILOSOPHY OF CLEARANCE PROCEDURES** The following principles, whether or not they are specifically addressed in this Bulletin, are considered basic to the safe operation of the joint power system:

- 1.9.1.** The priorities involved in applying Clearance Procedures are:
- a. Physical safety of employees and the public.
  - b. Integrity and reliability of the power system.
  - c. Protection of equipment.
  - d. Service to the customer.

1.9.2. Clearances, Hot Line Orders, Special Work Permits, and Danger Tags are applied to protect people; Special Conditions are applied to protect equipment and/or the power system.

1.9.3. Throughout the Bureau and Western, all switching; placement, issuance, receipt, release, and removal of Clearances, Hot Line Orders, and Special Work Permits; establishment of Special Conditions; and all other operations associated with the joint power system are to be performed by Authorized Personnel.

1.9.4. All switching operations shall be guided and tested by the fundamental principle, "Start with the correct procedure and follow it exactly," and can best be accomplished by following:

**THE SIX BASIC STEPS OF SWITCHING**

1. Carry switching program with you while switching.
2. Verify anticipated device position.
3. Recheck switching program for right location and right sequence.
4. Touch device identification nameplate to verify location.
5. Operate the device.
6. Verify desired device position.

1.9.5. It is the responsibility of the Regional Director/Area Manager to assure that Clearance Procedures are thoroughly understood, properly applied, and strictly adhered to by all their employees.

1.9.6. Employees should be indoctrinated to think, "If I violate this Safety, Hot line, or Danger Tag, I may kill somebody!"

1.9.7. A basic principle pertaining to power system operation is that the lengths of time the equipment is abnormal or removed from service for work shall be kept to a minimum. This will be accomplished by the following:

- a. The equipment will be made available to the crews at the prearranged time.
- b. The crews will be ready to start work at the prearranged time.
- c. The crews will release the equipment promptly upon completion of the work.
- d. The power system equipment will be returned to service as soon as possible.
- e. Delays such as shift changes and lunch periods shall not unduly impede or delay returning equipment to normal.

## II. DEFINITIONS

2.1. "Agency" (capitalized) means the Bureau and Western, individually or collectively, as opposed to other Federal entities, utilities, co-ops, or customers, which herein are called "Foreign."

2.2. "Authorized Personnel" means selected personnel who have been properly trained, tested, and certified to perform the action being authorized. When certified, names shall be entered on the official lists of authorizations.

2.3. "Clearance" is a statement with documentation from the Operations Supervisor to the Job Supervisor declaring that the equipment to be worked on has been deenergized and isolated from hazardous sources of energy.

2.4. "Control Center" is a Bureau (usually) station from which one or more powerplants are remotely controlled; i.e., Casper, Flatiron, and Central Valley Operations Control Centers.

2.5. "Dispatch Office" is a station from which load scheduling and/or system switching functions are directed.

2.6. "Dispatcher" is the Bureau, Western, or Foreign Utility employee in charge of the system switching function at a Dispatch Office as defined in paragraph 2.5. above.

2.7. "Emergency" is a situation in which (a) facilities are in such a condition as to be a hazard to the public, Agency personnel, or the power system equipment; (b) there is a power outage to customers which could be hazardous to life or property.

2.8. "Equipment" means any machine, device, or apparatus, either electrical or mechanical, including electrical circuits, transmission lines, piping systems, or waterways.

2.9. "Foreign" (adjective) refers to any non-Agency (non-Bureau or non-Western) utility, power system, station, or employee.

2.10. "General Switching" is switching performed for line sectionalizing or system (electrical, mechanical, hydraulic, etc.) rearrangement for testing and/or changes in operating conditions. Such operations are not normally associated with Clearances, Hot Line Orders, or Special Conditions.

**2.11. "Hot Line Order"** is a statement with documentation from an Operations Supervisor to a Job Supervisor that the automatic reclosing is turned off and that the equipment covered by the Hot Line Order will not be reenergized until the conditions stated on the Hot Line Order are met. This allows specific work to be done on or near a line or other equipment without requiring that it be disconnected from all sources of electrical energy. The equipment is to be considered energized or "hot."

**2.12. "Job Supervisor"** is any person authorized to request, receive, and release Clearances and/or Hot Line Orders and who is charged with the responsibility for the job.

**2.13. "Operations Supervisor"** is any person authorized to issue Clearances, Hot Line Orders, Special Conditions, or General Switching; and who also may be authorized to direct switching and other operations required in placing and removing the protection for Clearances, Hot Line Orders, and Special Conditions. Depending upon the station and the equipment, those authorized may include dispatchers, operators, foremen, electricians, linemen, technicians, and plant mechanics, supervisors, and engineers.

**2.14 "Protection"** is all switching, tagging, or other work done to make a given piece of equipment safe to work on.

**2.15. "Safe Clearance Procedure"** is the method which shall be followed in requesting, placing, issuing, transferring, releasing, and removing a Clearance.

**2.16. "Special Condition"** means an unusual temporary condition pertaining to equipment, and is not associated with other protective procedures. This term indicates the requirement for special operating instructions and information on the current condition of the equipment.

**2.17. "Special Work Permit"** is a statement which formalizes and documents the preparation and coordination between Agency and non-Agency personnel for Clearances and Hot Line Orders to facilitate work by non-Agency forces on or near Agency power facilities, except as provided for in Sections XII and XIII.

## **2.18. STATIONS**

**2.18.1. "Attended Station"** means any station manned at all times.

**2.18.2. "Semiattended Station"** means any station which is normally manned part time.

**2.18.3. "Unattended Station"** is any station not normally manned and includes stations which are physically checked periodically by qualified personnel.

**2.18.4. "Supervisory Controlled Station"** means any station which is normally operated from a remote location.

**2.19. "Switchman"** is any person authorized to perform switching and tagging operations. Those authorized may include dispatchers, foremen, operators, linemen, electricians, technicians, and plant mechanics.

**2.20. "Workman"** is any person authorized to inspect, service, repair, or otherwise be in contact with equipment. Those authorized may include electricians, testmen, technicians, linemen, mechanics, inspectors, operators, dispatchers, foremen, supervisors, and engineers.

## **III. GENERAL RESPONSIBILITY AND AUTHORITY**

**3.1.** Each Region/Area has the responsibility to ensure that the procedures and guidelines within this Bulletin are (1) understood by all concerned, (2) properly applied, and (3) strictly adhered to. Each supervisor shall make certain that all appropriate persons under his jurisdiction are instructed concerning the procedures and their application.

**3.2.** Formal lists of Authorized Personnel must be maintained. Each Region/Area shall provide its counterpart with a list of its personnel qualified and certified to request, issue, or receive Clearances or Hot Line Orders or to perform switching. It is the responsibility of each Region/Area to advise its Workmen, Switchmen, Job Supervisors, and Operations Supervisors as to the extent of their authority. It is the responsibility of each employee to confine his activities within his authorization. A list shall be maintained of personnel, other than Agency personnel, who are qualified to perform switching operations at the request of the operations supervisors.

**3.3.** If emergency switching is required and an authorized Switchman is not available, effort shall be made to utilize other personnel. These may be either Agency employees or employees

of other systems deemed qualified by the Operations Supervisor to perform the switching.

**3.4.** Each employee engaged in power system operations, maintenance, or construction shall be required to know and understand the procedures which apply to the work he is to perform. Regional/Area procedures developed from guides in this Bulletin take first precedence. Employees shall be subject to examination at any time on the procedures which apply to their duties.

**3.5.** Personnel visiting an unattended station shall report to the Operations Supervisor upon arrival and departure, and advise him of any planned work. Notification procedures should be posted near the telephone in the control room or building. The time of arrival, departure, and any work performed shall also be logged in the station log. Personnel visiting a semiattended station shall report to the attendant on duty upon arrival and departure and advise him of any planned work. If the attendant is temporarily absent, visiting personnel shall contact the Operations Supervisor. Whenever the part-time attendant plans to be absent from the station during his normal tour of duty, he shall advise the Operations Supervisor of the expected times and duration of his absence.

## IV. MATERIALS FOR USE WITH THESE GUIDES

### 4.1. SWITCHING PROGRAM FORM

**4.1.1. PURPOSE** The Switching Program Form formalizes and documents each step in the process of establishing and releasing Clearances, Hot Line Orders, Special Conditions, and performing General Switching. The needs of the Regions/Areas vary; therefore, one standard form is not practicable at this time. A typical Switching Program Form is shown in figure 1. Figure 2 is a typical switching order form (Bureau only) which may be used to supplement the Switching Program Form to facilitate switching at locations remote from the control center. These forms are not available from E&R Center stock. Each Region/Area interface shall develop Switching Program Forms for its specific needs, which provide documentation for three main categories: (1) "request and action taken" information; (2) switching placement program; and (3) switching removal program. Space for other information may be provided.

**4.1.2. APPLICATION** A Switching Program Form, or Switching Order where applicable, shall be completed by the responsible Operations Supervisor and checked by a second qualified person, when possible, for all operations requiring a Clearance, Hot Line Order, Special Condition, or General Switching. However, to limit interruption time to customers, it is permissible for the Operations Supervisor to direct emergency sectionalizing switching, and log operational times, without documenting this information on a Switching Program Form. It is desirable that copies of the appropriately filled-in Switching Program Form be sent in advance to each location involved in the program for reference and use by the Switchman during the switching and tagging operation. Where facsimile equipment is available at both the control center or dispatch office and the remote station, the Operations Supervisor may transmit a facsimile copy of the Switching Program Form to the Switchman at the remote location. Upon receipt of a facsimile, the Switchman will contact the control center or dispatch office and read back the Switching Program to verify that he understands what switching is to be accomplished by the order. Instead of sending copies to each location in advance, the Operations Supervisor can provide the information by available communication channels to the Switchman or second Operations Supervisor, who will write all information on the Switching Program Form pertinent to his location and repeat back the orders. The master Switching Program Form used by the Operations Supervisor shall clearly indicate those portions which are issued to each station as its part in placing the Clearance. It is intended that all documentation for operations covered by this Bulletin be done on the Switching Program Form to eliminate duplication of information on other forms, logs, or tags. Upon completion of the work, the Switching Program Form shall be kept as a permanent supplement to the log.

**4.1.3. NUMBERING** Each Switching Program Form shall be given a serial number. The necessary coding for the year and facility shall be prescribed by the Regions/Areas. One series of consecutive numbers can be used for all programs or a separate series of consecutive numbers can be used for Clearances, Hot Line Orders, Special Conditions, and General Switching. The form shall indicate whether the action is a Clearance, Hot Line Order, Special Conditions, or General Switching.





**4.1.4. INFORMATION** "Switching for Placement" and "Switching for Removal" are the parts of the form used to record in detail the exact operation required and the tagging information. Each operation shall be listed in the precise sequence to be performed including those operations or steps not requiring a tag. There shall be only one operation per line on the Switching Program Form. THE SWITCHMAN SHALL ALWAYS PERFORM OPERATIONS IN THE SEQUENCE LISTED ON THE SWITCHING PROGRAM FORM. If a question arises at any point during the switching sequence, this question shall be resolved before continuing with the Switching Program. The location of the Safety Tags defines the boundaries for Clearances and Hot Line Orders.

**4.2. LOGBOOK ENTRIES** All entries shall preferably be in ink or other permanent marking material. Entries shall be made as soon as practicable after the action has been accomplished. The name of the person making entries shall appear in the log. In addition to the documentation provided by the Switching Program Form, entries in the normal station log shall be made as follows:

**4.2.1. PLACEMENT ACTION** After the placement operations are complete and the action has been issued, the Operations Supervisor or the Switchman shall log the "date \_\_\_\_\_," "time \_\_\_\_\_," "type of action \_\_\_\_\_ (Clearance, Hot Line Order, Special Condition, or General Switching)," "assigned No. \_\_\_\_\_," "issued to \_\_\_\_\_," and "equipment covered by action."

**4.2.2. REMOVAL ACTION** After a Clearance, Hot Line Order, or Special Condition has been released and the removal operations completed, the Operations Supervisor or Switchman shall log the "date \_\_\_\_\_," "time \_\_\_\_\_," "type of action \_\_\_\_\_ (Clearance, Hot Line Order, or Special Condition)," "assigned No. \_\_\_\_\_," "released by \_\_\_\_\_," and "equipment covered by action."

**4.2.3.** It is imperative that each Region/Area develop a systematic method of keeping appropriate personnel informed concerning the status of Clearances, Hot Line Orders, and Special Conditions. To accomplish this, the following are required:

- a. The placement action log entry to be made in a distinctive color of ink, or a rubber stamp to be used to stamp the re-

quired format data in the log as shown in paragraphs 4.2.1 and 4.1.1. A distinctive color of ink may also be used for placement and removal actions using this stamp.

- b. A readily accessible file to be maintained of Switching Program Forms for active Clearances, Hot Line Orders, Special Conditions, and Special Work Permits.
- c. The Operations Supervisor to record outstanding Clearances, Hot Line Orders, and Special Work Permits at the beginning of each workday.

**4.3. SAFETY TAGS** These tags are used in connection with Clearances and Hot Line Orders to convey the warning, DO NOT OPERATE, as discussed in sections V and VI. Only approved prenumbered red plastic-type Safety Tags shall be used. Unnumbered tags (fig. 3) are stocked at the Denver E&R Center (code 942), or the Administrator's office (code A1530), and are available on request. Each Region/Area shall designate and affix appropriate identifying numbers and/or letters to at least one side of each tag. The choice of tag identifying numbers and/or letters must assure that there is no possibility of confusion with other tags used in the same or an adjacent operating area.

**4.4. HOT LINE TAGS** These tags are used in connection with Hot Line Orders to prevent reenergizing equipment, as discussed in section VI. Only approved prenumbered and marked yellow plastic-type Hot Line Tags shall be used for this purpose. Unnumbered tags (fig. 4) are stocked at the Denver E&R Center (code 942), or the Administrator's office (code A1530), and are available on request. The front side of the tag is to be completed in permanent marking, showing the delay required before reenergizing. The tags shall be prenumbered in each Region/Area.

**4.5. SPECIAL CONDITION TAGS** These tags are used to designate special conditions affecting equipment as discussed in section VII. Only approved tags (fig. 5) shall be used for this purpose. These tags are stocked at the Denver E&R Center (code 942) or the Administrator's office (code A1530) and are available on request. The tag is to be numbered and completed in ink or typewritten.

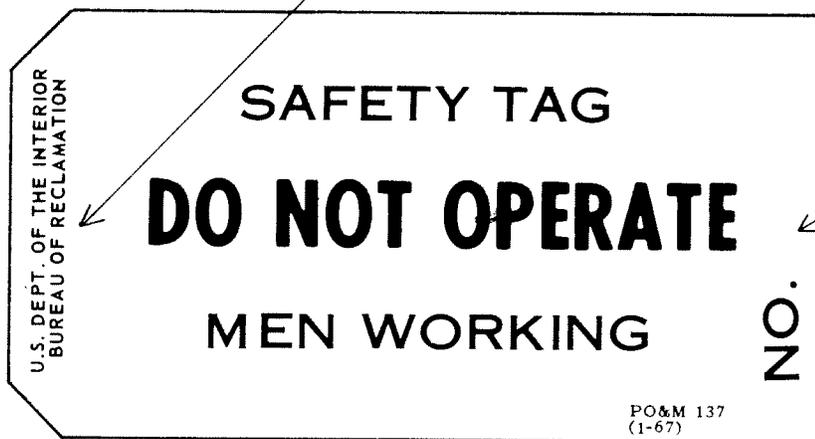
**4.6. SUPERVISORY CONTROL TAGS** These tags are to be used on supervisory control points as discussed in section IX. The tags shown (fig. 6) are for illustrative purposes only, and show the minimum amount of information required. There is a wide variety of supervisory equipment



BACK

Or

U.S. DEPT. OF ENERGY  
WESTERN AREA POWER ADMINISTRATION



FRONT

WAPA F6500.II

Figure 3. - Safety Tag.

U.S. DEPT. OF ENERGY  
WESTERN AREA POWER ADMINISTRATION

By the Region/Area  
To Be Prenumbered

Or

U.S. DEPT. OF ENERGY  
BUREAU OF  
OF INTERIOR  
RECLAMATION

HOT LINE TAG NO. \_\_\_\_\_

**BEFORE REENERGIZING**

(Indicate One)

WAIT \_\_\_\_\_ MINUTES

WAIT UNTIL CONTACT

U.S. DEPT. OF ENERGY  
BUREAU OF  
OF INTERIOR  
RECLAMATION

PO&M-135 (1-67)

Yellow plastic body

WAPA F6500.12

FRONT

Red Lettering

HOT LINE TAG

HOT LINE  
WORK

BACK

Figure 4. - Hot Line Tag.



Red body----->



**CLEARANCE  
INFORMATION**

Tag No. \_\_\_\_\_

Remarks \_\_\_\_\_

\_\_\_\_\_

(a)

Yellow body----->



**HOT LINE**

Tag No. \_\_\_\_\_

**BEFORE REENERGIZING**

Indicate One

WAIT \_\_\_\_\_ MINUTES

WAIT UNTIL CONTACTED

(b)

White body----->



**SPECIAL CONDITION**

Tag No. \_\_\_\_\_

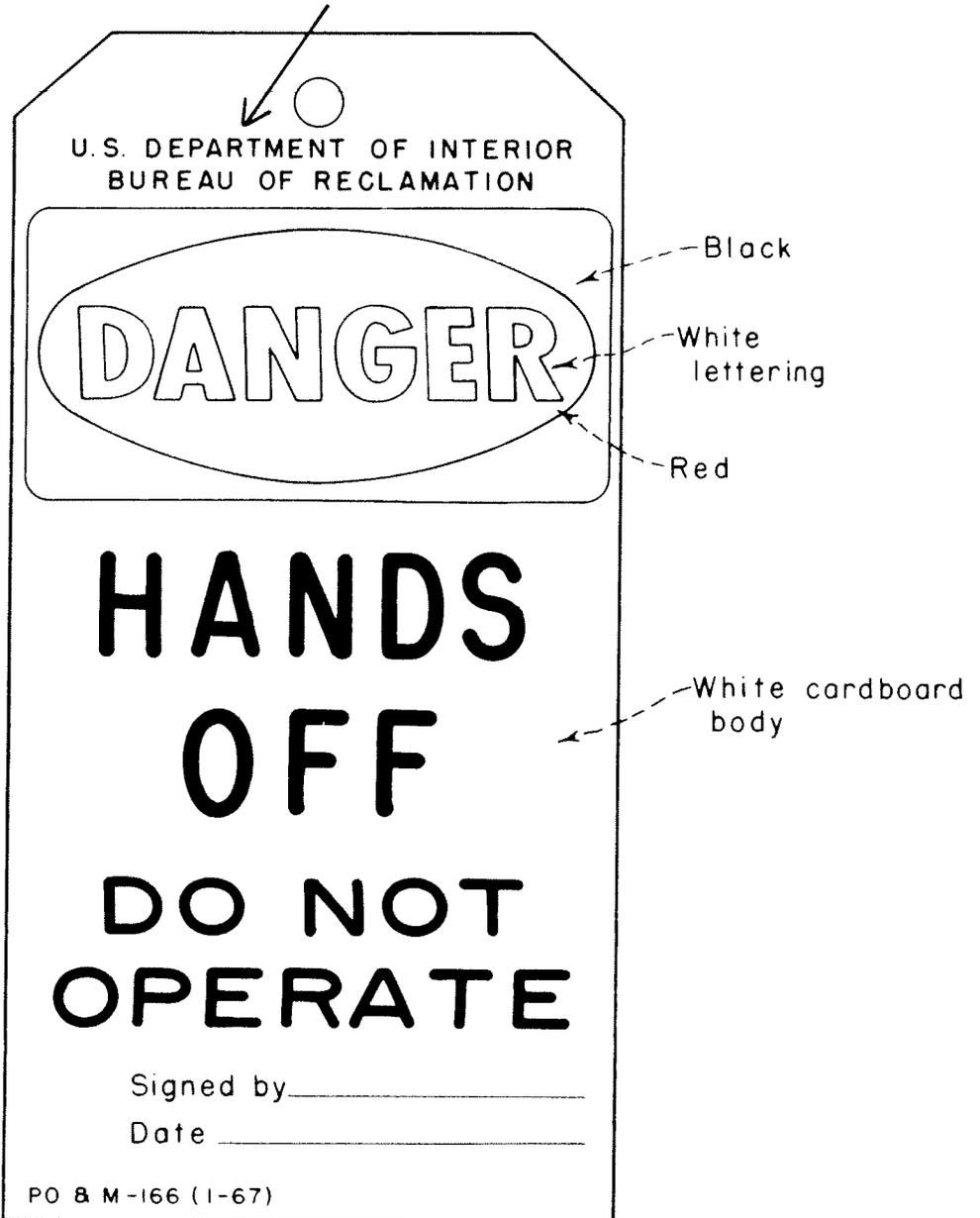
Remarks \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

Figure 6. - Supervisory Control Tags.

U.S. DEPT. OF ENERGY  
WESTERN AREA POWER ADMINISTRATION  
Or



WAPA F6500.14

Figure 7. - Danger Tag.



in use in the Bureau and Western; therefore, it is not possible to prepare a standard set of tags which will fit all supervisory control panels. Each Region/Area is responsible for developing tags for its own use, using the indicated color system.

**4.7. DANGER TAGS** These tags may be used as discussed in section VIII. These tags (fig. 7) are stocked at the Denver E&R Center (code 942), or the Administrator's office (code A1530), and are available on request. The tag is to be completed in ink.

**4.8. SPECIAL WORK PERMIT FORM** The Special Work Permit Form formalizes and documents the preparation and coordination between Agency and non-Agency personnel for Clearances and Hot Line Orders to facilitate work by contractors and non-Agency construction or maintenance forces on or near Bureau or Western power facilities. The Special Work Permit Form (PO&M-169) or (WAPA F6500.15) (fig. 8) is available on request from the Denver E&R Center (code 942), or the Administrator's office (code A1530).

This form provides:

- a. A listed protective action (Clearance or Hot Line Order) on a specified Bureau or Western power facility.
- b. A statement that the undersigned have discussed the work to be done, reviewed the details of the above-listed protective action for adequacy, and defined the limits and conditions of the safe working area.
- c. A written description and/or drawings of the limits of the safe working area.
- d. Space for the signatures of the Agency and contractor's representatives at the worksite indicating full agreement and understanding together with the date and time it is satisfactory to proceed with the work.
- e. A release statement to be signed by the contractor's representative that the work has been completed.

## V. CLEARANCES

**5.1. PURPOSE** Clearances are to establish, under a controlled discipline, a safe environment within which workmen can perform their assigned tasks. The Job Supervisor shall decide whether or not the degree of risk requires a Clearance, and if a Clearance is deemed necessary, he shall obtain a Clearance before starting the work. Clearances are accomplished by systematically isolating the equipment from all sources of hazardous energy (electrical,

mechanical, pneumatic, and hydraulic) and attaching Safety Tags (fig. 3) to the operating and control points for these sources of energy. A SAFETY TAG SHALL BE CONSIDERED THE SAME AS A LOCK, AND THE TAGGED POINT IS NOT TO BE OPERATED WHILE THE SAFETY TAG IS IN PLACE. A CLEARANCE IS USED ONLY FOR PROTECTION OF PERSONNEL, BUT MAY INCIDENTALLY PROVIDE PROTECTION FOR EQUIPMENT. The Clearance Procedure is intended to accomplish this protection with as little delay and inconvenience as possible.

## 5.2. RESPONSIBILITY AND AUTHORITY

**5.2.1. The Operations Supervisor** is responsible for authorizing and issuing Clearances on all equipment affecting the power system. Authority for issuing Clearances may be delegated to other Operations Supervisors. Normally this delegation will be established by prior administrative directive.

**5.2.2. The Operations Supervisor** shall issue all Clearances and Hot Line Orders on equipment which require protection at points distant from each other, such as on transmission lines or related substations.

**5.2.3. Switchmen** shall do all switching and operating of local controls and isolating equipment such as circuit breakers, disconnecting switches, grounding switches, valves, gates, etc., and shall place locks where practical and safety tags where required by the Switching Program.

**5.2.4. The Operations Supervisor** is responsible for preparing a correct Switching Program and properly directing the switching and related operations. The Switchman placing the protection is responsible for reviewing the switching for his location and for properly executing it. The JOB SUPERVISOR is responsible for CHECKING the protection provided to assure himself that it is adequate to carry out the assigned work in a safe manner. NO PERSON WILL BE REQUIRED TO WORK ON A JOB OR PIECE OF EQUIPMENT THAT HE CONSIDERS UNSAFE, and must request any additional protection he deems necessary to make the job safe.

**5.2.5. The Job Supervisor** shall notify each person working under the Clearance of the conditions and extent of the Clearance before work is started. He shall promptly notify each person working under the Clearance of any

changes in conditions or status of the equipment. Upon completion of the job, the Job Supervisor shall see that all personnel under his assigned Clearance are in the clear and that all temporary protection such as Danger Tags and personal grounds are removed, and that any unusual conditions are reported to the Operations Supervisor. The Job Supervisor shall then release the Clearance to the Operations Supervisor. The Operations Supervisor shall then direct the Switchman (or Switchmen) to perform the switching and related operations to remove the protection.

**5.2.6.** If it is necessary to perform prescheduled work requiring a Clearance at an isolated location where communication with the dispatching office or control center is difficult or impossible, the Operations Supervisor will issue, and the Job Supervisor, who is qualified and certified to perform each function, will record on the Switching Program Forms, complete instructions for all switching and protection required, including instructions for restoring the equipment to normal without further communication, before the Job Supervisor leaves for the work location. On arrival at the work location, the Job Supervisor will perform and log all switching and tagging operations, then log taking his own Clearance under the number preassigned by the Operations Supervisor. On completion of the job, the Job Supervisor will log the release of his Clearance, then perform the switching to restore the equipment to normal, which he will also log. If for any reason the work does not proceed according to the schedule under which the instructions were issued, the Job Supervisor shall make every reasonable effort to advise the Operations Supervisor of the changes in the work schedule. In all cases, the Job Supervisor shall report all operations as soon as he is able to communicate with the Operations Supervisor.

**5.2.7.** In an emergency situation, where the Job Supervisor determines that a piece of equipment needs immediate attention, and communications with the Operations Supervisor is not available, he shall provide his own Clearance protection. In placing and releasing his Clearance, he shall observe all the principles of switching, tagging, and logging as set forth in this Bulletin insofar as circumstances permit. He shall furnish a complete report of all operations he performed to the Operations Supervisor as soon as possible thereafter.

**5.3. OBJECTIVE** The proper technique in applying a Clearance is to encircle the equipment to be worked on with a line of protection by opening switches, closing supply valves or gates, opening drain valves, and opening potential or other transformer secondaries where these could be inadvertently energized from the low-voltage side. These devices shall be tagged and locked wherever means for locking is provided. Grounding switches may be closed, locked, and tagged when they are provided, if doing so does not interfere with the work to be accomplished. (Local Area tests should be conducted to determine if adjacent parallel energized lines might cause increased ground current between closed station ground switches and Personal Protective Grounds installed at the worksite on a deenergized line.) The equipment to be worked on should be free of Safety Tags as far as possible so as not to impede the work to be accomplished, and permit component parts to be moved.

#### **5.4. PLACING A CLEARANCE**

**5.4.1.** The Job Supervisor shall request a Clearance from the Operations Supervisor as soon as practicable (at least 24 hours in advance, except in emergencies), and shall give the information required on the Switching Program Form and the limits needed for a Safe Clearance.

**5.4.2.** Before switching is started, the Operations Supervisor shall prepare the Switching Program Form which shows the sequence of the required switching and/or operations. All Switching Programs shall be checked by a second qualified person whenever possible. Each party shall be responsible for the correctness of the procedure.

**5.4.3.** Detailed instructions in the use of the Switching Program Forms, directing and reporting the switching, and disposition of the forms shall be prepared by each Region/Area.

**5.4.4.** Every person involved in placing and issuing a Clearance shall analyze the switching orders. If there are any questions regarding the completeness or correctness of the Switching Program, these questions are to be resolved before the switching is started. If a question arises at any point during the switching sequence, this question shall be resolved before continuing with the Switching Program.

**5.4.5.** After verification by the Switchman at each location that all operations called for in

the Switching Program have been completed and that all Safety Tags have been placed, the Operations Supervisor shall prepare to issue the Clearance to the Job Supervisor. Before issuing the Clearance, the Operations Supervisor shall clearly state to the Job Supervisor receiving the Clearance exactly what protection has been provided. This statement shall include the status of pertinent equipment such as breakers, disconnecting switches, grounding switches, and potential secondaries; the location of each Safety Tag, and finally, that the equipment is isolated from all hazardous sources of energy. The equipment must be correctly and definitely identified. In the case of a transmission line, it must be given its proper designation and all terminals between which the Clearance is given must be specifically identified. The Job Supervisor receiving the Clearance shall repeat to the Operations Supervisor the exact protection provided.

**5.4.6.** After the above requirements have been fulfilled, the Operations Supervisor shall issue the Clearance to the Job Supervisor designated to receive the Clearance. The Clearance information shall be logged by the Operations Supervisor.

**5.5. OPERATING EQUIPMENT UNDER CLEARANCE** Within the perimeter of the Clearance, the Job Supervisor holding the Clearance may allow workmen to operate equipment which is not Safety Tagged for tests and adjustments. The Job Supervisor is responsible to see that the equipment is safe to operate and returned to the original position; that is, open or closed.

**5.6. CHECKS AND TESTS ON EQUIPMENT UNDER CLEARANCE** If it is necessary to energize the equipment under Clearance at its primary source of energy (electrical, mechanical, or hydraulic) for testing or checking purposes before the work is completed, the Clearance shall be released in the usual manner, the applicable Safety Tags removed, the tests made, the Safety Tags replaced, and a new Clearance issued. For checks or tests not involving energizing the main equipment at its primary source of energy, but which require operation of auxiliary equipment controls with Safety Tags, the following procedure shall be observed.

**5.6.1.** The Job Supervisor holding the Clearance shall contact the Operations Supervisor and request that a check or test operation be made. The Job Supervisor shall ex-

plain exactly what tests are to be made and what equipment is to be operated. The Job Supervisor shall also ensure that all personnel are in the clear and have been advised of the test.

**5.6.2.** The Operations Supervisor, after establishing that the equipment can be operated safely and that all personnel are in the clear and have been advised of the test, shall have the Switchman temporarily remove the necessary Safety Tags to permit the operation. The Operations Supervisor shall have the Switchman check the position of devices where tags were removed for agreement with the Switching Program Form and replace all Safety Tags immediately after the operational check is made and before work is resumed. This procedure requires close coordination between the Operations Supervisor, Job Supervisor, Switchman, and Workmen.

## **5.7. RELEASING A CLEARANCE**

**5.7.1.** Upon completion of the work and after removal of all personal grounds, Danger Tags, and other devices attached to the equipment by workmen, the Job Supervisor shall release his Clearance by reporting to the Operations Supervisor. The Job Supervisor shall state that all personnel are clear of the equipment, that all personal grounds, Danger Tags, and other devices are removed, and the equipment is in safe operating condition. If any of the above conditions have not or cannot be met, he shall so state giving full particulars. The Operations Supervisor will so note the release on the Switching Program Form and notify all personnel involved.

**5.7.2.** The Job Supervisor who received the Clearance shall personally release his Clearance, with the exception that in an emergency and/or if the Job Supervisor is unavailable for an unacceptable period of time, his supervisor shall assume full responsibility for the Clearance, including its release. This situation shall be fully documented on the Switching Program Form.

**5.7.3.** The Operations Supervisor shall log the pertinent information regarding the releasing of the Clearance in accordance with detailed instructions in paragraph 4.2.

## **5.8. RESTORING EQUIPMENT TO NORMAL**

**5.8.1.** The Operations Supervisor shall notify the Switchman that the Clearance has been

released and shall order the protection removed and the equipment returned to normal. The use of the Switching Program Form, the responsibility for directing the switching operations, analysis of the completeness and correctness of the switching and instructions, and the reporting of the operations performed shall follow the same routine outlined under "Placing a Clearance," paragraph 5.4.

**5.8.2.** At the discretion of the Operations Supervisor, it is permissible to delay the removal of Safety Tags at remote locations until it is practical to remove them. This permission to delay removal and the subsequent removal shall be recorded separately in the log. The Switching Program shall not be considered complete until all field Safety Tags are removed.

**5.9. IDENTICAL CLEARANCE** When it is desired to issue two or more concurrent Clearances on the same equipment requiring the same protective boundaries, and exactly the same safety tag application, the Operations Supervisor shall record ALL Clearances issued on the SAME Switching Program Form, which shall be marked distinctively to indicate an identical Clearance. This shall be done by filling in the Job Supervisor's name for each Clearance in the "Issued to \_\_\_\_\_" column. The same Clearance number, plus a different suffix letter (A, B, C, etc.) or suffix number for each additional Clearance, should be used in the "No. \_\_\_\_\_" column. No additional Safety Tags need be placed, and no protection is to be removed from the equipment until ALL Clearances have been released and so noted in the "Released by \_\_\_\_\_" column of the Operations Supervisor's Switching Program Form.

**5.10. TRANSFER OF A CLEARANCE** If the Job Supervisor holding a Clearance desires to transfer his responsibility to another Job Supervisor, he must report to the Operations Supervisor and state his intention. The second Job Supervisor shall then request and obtain an identical Clearance in the manner described in paragraph 5.9, after which the first Job Supervisor shall release his Clearance. The second Job Supervisor will then be held responsible for the release of his Clearance upon completion of the work.

**5.11. USE OF DANGER TAGS WITHIN A CLEARANCE** Danger Tags (paragraph 4.7) may be used within the perimeter of a Clearance for protection of workmen and/or equipment, as stipulated in section VIII.

## **5.12. CHANGE OF CLEARANCE PERIMETER**

If it becomes necessary to alter the perimeter of an existing Clearance, the Job Supervisor shall request a new Clearance with the desired perimeter. The Operations Supervisor shall enter the switching steps on the Switching Program Form for placement of Safety Tags to cover the new Clearance perimeter. After the switching has been performed and new tags placed, the Operations Supervisor shall issue the new Clearance to the Job Supervisor who shall then release his original Clearance. The Operations Supervisor shall enter the switching steps for removal of the Safety Tags associated with the original Clearance which are not required under the new Clearance.

## **VI. HOT LINE ORDER**

### **6.1. PURPOSE**

**6.1.1.** The Hot Line Order is to permit work to be done on or near energized equipment under certain conditions that are considered safe for qualified workmen. This is accomplished by removing from service all automatic reclosing features capable of energizing the equipment and by tagging these features with a Safety Tag or as outlined in paragraph 6.3.5. Also, by placing a Hot Line Tag on the appropriate control switches (local and/or supervisory) of all breakers connected to the equipment, reenergization of the transmission line by its terminal breakers or switches is prohibited before expiration of the prescribed time or until contact is made with the Job Supervisor holding the Hot Line Order.

**6.1.2.** Hot Line Orders shall NOT be issued on a power circuit while any work or tests are in progress on protective relays or control circuits which would compromise the tripping of any circuit breakers involved in the Hot Line Order. This paragraph does not prohibit communication or relay personnel from working on microwave, single sideband carrier channels, or other circuits, if such work will not prevent the phase and ground protective relays from tripping any circuit breakers involved in the Hot Line Order.

**6.1.3.** The purpose of waiting the prescribed time indicated on the Hot Line Tag is to give the workmen time to get themselves in the clear. IT IS NOT TO BE USED FOR THE PURPOSE OF REMOVING EQUIPMENT THAT MAY HAVE COME IN CONTACT WITH THE ENERGIZED EQUIPMENT.

**6.2. RESPONSIBILITY AND AUTHORITY** The responsibility and authority to issue and receive a Hot Line Order and to place and remove the protection is essentially the same as outlined for a Clearance under "Responsibility and Authority," paragraph 5.2.

### **6.3. PLACING A HOT LINE ORDER**

**6.3.1.** The Job Supervisor shall request a Hot Line Order from the Operations Supervisor as soon as practical (at least 24 hours in advance, except in emergencies), and shall give the information required on the Switching Program Form.

**6.3.2.** The Operations Supervisor shall prepare the Switching Program Form which shows the sequence of the required switching and tagging operations. All Switching Programs shall be checked by a second qualified person whenever possible. Each party shall be responsible for the correctness of the procedure.

**6.3.3.** Every person involved in placing and issuing a Hot Line Order shall analyze the Switching Program. If there are any questions regarding the completeness or correctness of the Switching Program, these questions are to be resolved before the switching is started. If a question arises at any point during the switching sequence, this question shall be resolved before continuing with the Switching Program.

**6.3.4.** After verification by the Switchman at each location involved that all associated automatic reclosing devices have been deactivated and tagged with Safety Tags, except as provided in paragraph 6.3.5, and all control switches (local and/or supervisory) for circuit breakers involved have been tagged with the proper Hot Line Tag, the Operations Supervisor shall issue the Hot Line Order to the Job Supervisor. When placing a Hot Line Order on a bus section protected by a bus differential scheme which will trip all sources of power to, and block closing of all power circuit breakers associated with, that particular bus, instead of tagging the control switch for each breaker supplying the bus, it is permissible to tag only the bus differential auxiliary (manual reset) relay with a Hot Line Tag. In issuing the Hot Line Order, the Operations Supervisor shall state to the Job Supervisor exactly what protection has been provided. Where applicable, this statement shall include which circuit breakers are involved and which automatic

devices have been deactivated, as well as the prescribed "wait" time interval or "wait until contact" shown on each Hot Line Tag. The Job Supervisor receiving the Hot Line Order shall repeat back to the Operations Supervisor the exact protection provided. The Hot Line Order information shall be logged by the Operations Supervisor.

**6.3.5.** Some unattended substations and other power system facilities are equipped, or capable of being equipped, to disable power circuit breaker automatic reclosing circuits by means of supervisory control from a control center. When stations are so equipped, it is permissible to issue Hot Line Orders without the physical placement of Safety and Hot Line Tags at the stations, if the supervisory control provides:

- a. A positive and reliable indication at each station that a Hot Line Order is in effect, and
- b. A positive and reliable indication back to the control center that the automatic recloser is indeed inoperable, and
- c. That the circuitry involved in (a) and (b) above will maintain status in the event of an electrical or supervisory control system failure.

Operating personnel shall be fully trained in the use of the master station control prior to operating this equipment. This type of action requires full recognition of the remote Hot Line Order indication by O&M personnel at the control center and remote stations, and the establishment of highly disciplined procedures to ensure that the full protection afforded by the Hot Line Order is not compromised.

### **6.4. REENERGIZING A LINE WHICH HAS TRIPPED OUT WHILE UNDER A HOT LINE ORDER**

**6.4.1.** When a transmission line or other power facility which is under a Hot Line Order becomes deenergized by operation of an associated circuit breaker, the Operations Supervisor shall determine that one or the other of the following conditions has been satisfied before ordering the associated breakers reclosed:

- a. The prescribed "wait" time has elapsed after the breaker tripped (in all cases, the Operations Supervisor shall make an effort to contact the Job Supervisor before energizing the line or equipment), or

- b. The Job Supervisor holding the Hot Line Order has been contacted and has stated that it is all right to reclose the circuit breaker to reenergize the line.

**6.4.2.** When the Job Supervisor notes that the "Hot" line has become deenergized, whether or not his work or personnel are responsible for the outage, the Supervisor shall immediately order all personnel clear of the circuit, ascertain if the circuit within his work area can be safely reenergized, and then contact the Operations Supervisor to inform him of the details.

**6.4.3.** When a Switchman is ordered by the Operations Supervisor to reclose a circuit breaker which has tripped while under a Hot Line Order, he shall:

- a. Remove the Hot Line Tag from the control switch and operate the control switch to close the circuit breaker.
- b. After the circuit breaker has closed, he shall replace the Hot Line Tag on the control switch if the Hot Line Order is to be continued.
- c. Record pertinent information on the tripout and reclosure in the Station Log.

**6.4.4.** After a circuit under a Hot Line Order has tripped and has been closed, the Operations Supervisor will inform the Job Supervisor that the circuit breakers have been closed and that the line is reenergized.

**6.4.5.** If a transmission line or other power facility which is under a Hot Line Order is to be deenergized or reenergized due to operational requirements by the Operations Supervisor, the Job Supervisor must be notified before either operation is attempted.

## **6.5. REMOVING A HOT LINE ORDER**

**6.5.1.** Upon completion of the work for which the Hot Line Order was taken, the Job Supervisor shall release his Hot Line Order by reporting to the Operations Supervisor.

**6.5.2.** The Job Supervisor who received the Hot Line Order shall personally release his Hot Line Order, with the exception that in an emergency and/or if the Job Supervisor is unavailable for an unacceptable period of time, his supervisor shall assume full responsibility for the Hot Line Order, including its release. This situation shall be fully documented on the Switching Program Form.

**6.5.3.** The Operations Supervisor shall log the pertinent information regarding the release of the Hot Line Order in accordance with paragraph 4.2.3. He will then proceed to restore the line to normal status in accordance with instructions in paragraph 5.8.

**6.5.4** The Job Supervisor holding a Hot Line Order shall remain at the work site at all times while the work is being performed under the order.

**6.6. IDENTICAL HOT LINE ORDERS** When it is desired to issue two or more Hot Line Orders on the same equipment requiring the same protection, a procedure similar to that outlined in paragraph 5.9 for Identical Clearances shall be followed.

## **VII. SPECIAL CONDITION**

**7.1. PURPOSE** The Special Condition procedure is to provide temporary special operating or limiting instructions for equipment. Although a Special Condition may serve as temporary protection for equipment, IT SHALL NEVER BE USED FOR PERSONNEL PROTECTION. The Special Condition procedure shall not be used for permanent instructions which should be given on permanent instruction plates or by other acceptable means. If used for an extended period of time, the Special Condition Tag shall be replaced and updated annually to reflect current equipment and/or operating changes.

**7.2. RESPONSIBILITY AND AUTHORITY** Any employee who observes that equipment is damaged or in a condition which may limit its serviceability or operation shall report such condition to the Operations Supervisor as soon as practical. The Operations Supervisor shall determine if the Special Condition procedure is applicable. Necessary instructions shall be issued by the Operations Supervisor.

**7.3. PLACING PROCEDURE** If possible, application of the Special Condition shall be accomplished by attaching to the control device a Special Condition Tag which details the necessary instructions. Alternatively, the tag may be placed in a conspicuous location on the equipment. Placement of all Special Conditions shall be identified by an assigned number and documented either by a Switching Program Form or in the log.

**7.4. REMOVAL PROCEDURE** When the condition requiring a Special Condition no longer exists, the Operations Supervisor shall order the

removal of the Special Condition Tags. Such removal shall be documented either by a switching program form or in the station log.

## VIII. DANGER TAGS

### 8.1. PURPOSE

**8.1.1.** Danger Tags (fig. 7) may be used within the perimeter of an existing Clearance, for the protection of workmen. Danger Tags may also be used without a Clearance to prevent the operation of electrical, mechanical, pneumatic or hydraulic equipment for the protection of workmen. Approval of the Operations Supervisor must be secured before placing Danger Tags on equipment which might affect power system operations.

**8.1.2.** Danger Tags shall not be used on electrical circuits above 600 volts, and shall not be used as a substitute for a Clearance or for Safety Tags where the protection required should be furnished by a Clearance. Danger Tags are not intended for long term use and shall be reviewed and updated at least semiannually.

**8.2. RESPONSIBILITY AND AUTHORITY** Job Supervisors have the authority to place and remove Danger Tags within the areas of their work responsibility. This authority may be delegated by the Job Supervisor for placing and removing Danger Tags within the perimeter of a Clearance.

### 8.3. PLACING DANGER TAGS

**8.3.1.** Danger Tags may be placed on equipment inside the perimeter of a Clearance at the Job Supervisor's discretion.

**8.3.2.** Without a Clearance, the Job Supervisor shall secure approval from the Operations Supervisor before operating, deenergizing, or placing Danger Tag on equipment that might affect power system operations.

**8.3.3.** The Job Supervisor (or workman he has authorized) shall sign and date each Danger Tag that he places. The Job Supervisor shall keep a written record of the location of all Danger Tags he or the delegated workman has placed.

**8.4. REMOVING DANGER TAGS** When the work is completed, the Job Supervisor (or workman he has authorized) shall remove all Danger Tags he has placed, and shall return the equipment to the "as found" position. Equip-

ment may be positioned otherwise with the concurrence, or at the request of the Operations Supervisor. Danger Tags shall be removed only by the person who signed, dated, and placed the tag. If it becomes necessary to remove a Danger Tag through a second party, the procedures detailed in paragraph 5.7.2 shall be used and fully documented in the Station Log. The Job Supervisor shall notify the Operations Supervisor when Danger Tags placed without a Clearance are removed from equipment that affects power system operations.

## IX. TAGGING OF EQUIPMENT OPERATED BY SUPERVISORY CONTROL

**9.1. SUPERVISORY CONTROL WITH CRT (CATHODE RAY TUBES)** When a Clearance, Hot Line Order, or Special Condition is issued on equipment that is operated by a supervisory control system which utilizes CRT displays, the status of such equipment shall be positively indicated by means of an appropriate symbol displayed on all CRT displays which serve as the supervisory control point. If Clearance, Hot Line Order, and Special Condition placement or removal data are automatically logged and documented by means of the computer printout, these printouts supplement the documentation in the Station Logs and Switching Programs.

**9.2. OTHER SUPERVISORY CONTROL SYSTEMS** When a Clearance, Hot Line Order, and Special Condition is issued on equipment which is operated by a supervisory control system without CRT display, the supervisory control point shall be tagged with an appropriate tag similar to those in figure 6(a) (Clearance); figure 6(b) (Hot Line Order); and figure 6(c) (Special Condition). Placement and removal of the tag shall be documented on the Switching Program Form.

**9.3. CLEARANCE** When a Clearance is involved, the Safety Tag indication on the CRT discussed in paragraph 9.1, or the Safety Tag placed on the supervisory control point in accordance with paragraph 9.2, is for the information of the Operations Supervisor. The CRT indication and the Supervisory Safety Tag SHALL NOT BE SOLELY RELIED UPON TO PROTECT WORKMEN.

## X. GENERAL SWITCHING

**10.1. PURPOSE** General Switching is performed for line sectionalizing or system rearrangement for testing and/or changes in operating conditions. Such operations are not normally associated with Clearances, Hot Line Orders, or Special Conditions.

**10.2. PROCEDURES** A Switching Program Form shall be prepared and checked, if possible, for each application of General Switching. The operations shall be directed by the Operations Supervisor similar to switching performed for protection. The Switchman shall perform each step in sequence and complete the Switching Program Form as applicable. Tags are not required for this procedure. Local standing operating procedures may be used and the Switching Program Form is not needed for routine operation of powerplant, pumping plant, and switchyard equipment such as generators, pumps, compressors, etc., not involving operation of disconnect switches.

## XI. OPERATIONS ASSOCIATED WITH CONTRACTORS OR NON-AGENCY FORCES

**11.1. SPECIAL WORK PERMIT** Except as outlined in section XII, whenever a contractor or non-Agency organization is involved in a construction or maintenance activity on or near equipment in a Bureau or Western power facility, a Special Work Permit (fig. 8) is required to authorize the contractor to proceed with the work. When new equipment can be energized from a hazardous source, a Clearance shall be requested and issued. "Contractor" as used in this section refers not only to Bureau or Western contractors, but also to construction and maintenance forces of non-Agency organizations which are responsible to the Agency for this work.

Normally, properly qualified and authorized Agency O&M representatives will request the Clearances or Hot Line Orders, perform the required switching, receive the Clearances or Hot Line Orders, and issue the Special Work Permit. As appropriate, the Project Manager or District Manager may qualify and authorize an employee in the Bureau's or Western's Construction Office to perform this O&M function.

Under all conditions the requirements of CONSTRUCTION SAFETY STANDARDS and applicable safety and procedures paragraphs in the Construction Specifications shall be complied

with when Bureau or Western Contractors or non-Agency forces are involved.

**11.2. PROCEDURE INVOLVING A CLEARANCE** When the sequence of work requires that facilities be deenergized, the contractor's authorized representative shall inform the Agency's authorized representative-in-charge of his plan for accomplishing the work in such detail as may be necessary and shall request the Agency's representative to arrange for the required outage. The request shall be made with sufficient advance notice to assure that the Operations Supervisor can accommodate the action, and shall include the name of the contractor's authorized supervisor who will be responsible for the work.

**11.2.1.** Following approval of an outage, an authorized Agency employee shall secure a Clearance which documents that the equipment to be worked on has been deenergized and isolated from hazardous sources of energy. A Special Work Permit Form will be prepared in duplicate.

**11.2.2.** The Agency employee holding the Clearance shall, in turn, review with the contractor's authorized representative the limits of the deenergized working area and any special conditions pertinent to the Clearance as follows:

- a. When the work is the responsibility of an Agency Construction Office, he shall acquaint both the authorized representative of the Bureau's or Western's Construction Office and the authorized representative of the contractor with the full details.
- b. When non-Agency construction or maintenance forces not under the jurisdiction of an Agency Construction Office perform work in an Agency facility, they shall give full details to the authorized representative of the organization that arranged for the work and is responsible to the Agency.

**11.2.3.** After the circuit has been deenergized, the Agency employee holding the Clearance, the Agency's representative in charge at the worksite (both of whom may be the same individual), and the contractor's authorized representative shall inspect the worksite to verify the adequacy of the information on the Special Work Permit, which specifies what circuits and facilities have been deenergized, and defines the limits and conditions of the safe working area.

**11.2.4.** The Agency representative(s) and the contractor's authorized representative shall then sign all copies of the Special Work Permit at the worksite authorizing the contractor to proceed with the work and each representative shall retain a copy. No work shall be done until a Special Work Permit has been signed, nor shall any work be done in an area not specifically covered by the Special Work Permit.

**11.2.5.** After the Special Work Permit has been signed by all parties, and prior to commencement of any other items of work, the contractor shall, under the observation of the Agency representative-in-charge, use a hot stick to "feel out" and verify that the circuit is deenergized, and then install Personal Protective Grounds at the worksite in accordance with applicable safety standards. Single-phase grounds are prohibited. Grounding shall be done with hot stick clamp-type grounds, placed and removed with a hot stick. Following the grounding, the contractor shall place necessary barricades and take whatever other safety measures are necessary before proceeding with the work.

**11.3. PROCEDURE INVOLVING A HOT LINE ORDER** Where work must be performed in close proximity to energized facilities, and an outage on these facilities cannot be arranged, a Special Work Permit shall be issued specifying a Hot Line Order for the energized facilities to ensure against reenergization should accidental contact be made with an energized circuit. The responsibilities of the contractor's and Agency's authorized representatives and the use of the Special Work Permit shall be as outlined under paragraph 11.2.

**11.4. RELEASE OF SPECIAL WORK PERMIT AND CLEARANCE OR HOT LINE ORDER** When the work has been completed, the contractor's authorized representative shall sign all copies of the Release of the Special Work Permit certifying that all personnel are clear of the area covered by the Special Work Permit and that all protective grounds and barricades have been removed. The Agency employee holding the action will:

- a. Check to determine that the equipment installed or modified is satisfactory for normal service or energization, or is in safe condition for the action to be released, with such determination fully described to the Operations Supervisor.
- b. Inform the Operations Supervisor that the Special Work Permit has been released.

The Clearance or Hot Line Order can then be released in the normal manner, but in no case shall it be released until the Special Work Permit has been released.

**11.5. TRANSFER OF RESPONSIBILITY FOR WORK PERFORMED UNDER A SPECIAL WORK PERMIT** Should it be necessary to transfer the responsibility for work under a Special Work Permit from one contractor's authorized representative to another, a new Special Work Permit shall be issued and the existing Special Work Permit released, as outlined in preceding paragraphs of this section. In the event the contractor assigns a new authorized representative and the old representative is not available to release the old Special Work Permit, the new authorized representative shall sign the release of the old Special Work Permit.

## **XII. OPERATIONS ASSOCIATED WITH NON-AGENCY MAINTENANCE FORCES**

**12.1. SCOPE** There are several situations where non-Agency utilities own transformers and/or circuit breakers and associated items of equipment which are installed in or connected to Bureau or Western facilities. Subject to the approval of the Project Manager, Area Manager, or his designated representative, authorized maintenance personnel of the non-Agency organization may be granted permission to perform switching and receive Clearances and/or Hot Line Orders to perform maintenance work on specified non-Agency equipment.

**12.2. RESPONSIBILITY** The non-Agency organization shall accept full responsibility for the safety of its employees, including the proper installation and removal of Personal Protective Grounds where required, and for all actions of its employees which might compromise the reliability of the Bureau or Western power system and the safety of Agency employees.

**12.3. AUTHORIZED PERSONNEL** The authorized representative of the non-Agency organization shall have been instructed and familiarized with the switching and clearance procedures by the Agency in the appropriate Agency station(s). Also, the authorized representative of the non-Agency organization shall have been certified in writing to the Project Manager, the Area Manager, or his designated representative by the non-Agency organization as being authorized to perform switching and to receive and execute Clearances and Hot Line Orders in specified Bureau or Western stations.

When so certified, the authorized representative becomes the "Job Supervisor" as defined in paragraph 2.10. A current list of authorized non-Agency personnel shall be maintained in the operating office.

Where the non-Agency organization issues its own Clearances in areas approved by the Project Manager, or Area Manager, a list of authorized non-Agency personnel is not required. The Agency Operations Supervisor, however, shall be informed when and where work is being performed by the non-Agency organization.

**12.4. PROCEDURES** All work shall be programmed with the Agency Operations Supervisor, and he shall be notified prior to removing the equipment from service and before returning it to service. In those cases directly involving the Agency Operations Supervisor, all switching, logging, and documentation of Clearances and Hot Line Orders shall be performed in accordance with section V, SAFE CLEARANCE PROCEDURE, and section VI, HOT LINE ORDER, or the equivalent established clearance procedures of the non-Agency organization.

Agency-issued clearances may be of the Interconnected System type, and the equipment owned by the non-Agency organization may be considered similar to a point of interconnection as discussed in paragraph 13.1.1.

### **XIII. OPERATIONS ASSOCIATED WITH INTERCONNECTED SYSTEMS**

#### **13.1. INTERCONNECTED SYSTEM CLEARANCES AND HOT LINE ORDERS**

**13.1.1. PURPOSE** To provide for the protection of all personnel at all points of interconnection between Agency and foreign power systems. The same procedures shall apply to interconnections between two Agency systems under separate dispatching jurisdiction, either interarea or intraarea.

**13.1.2. DEFINITION** An interconnected system Clearance or Hot Line Order (defined in various Agency operating offices as "Intercompany," "Source of Power," or "Dispatcher's" Clearance or Hot Line Order is a statement, with documentation, from one dispatching office to another that switching has been performed on one system as a partial or complete requirement for a Clearance or Hot Line Order on another system. The dispatching office receiving the interconnected system action is responsible for all other

switching and for issuing the Clearance or Hot Line Order to the Job Supervisor.

**13.1.3. RESPONSIBILITY** All interconnected system Clearances and Hot Line Orders and Special Conditions and General Switching between interconnected systems including Agency systems shall be handled by dispatchers in accordance with the appropriate operating agreements, unless the facilities have been delegated to others by the operating agreements.

**13.1.4. ISSUANCE TO FOREIGN SYSTEMS** When a Job Supervisor on a foreign system requires a Clearance or Hot Line Order that will require switching on an Agency system, he will arrange with his dispatching office to request an interconnected system Clearance or a Hot Line Order from the Agency dispatcher. The Agency dispatcher will then:

- a. Prepare a Switching Program Form clearly identified as "Interconnected System," "Intercompany," "Source of Power," or "Dispatcher's" and order switching in accordance with paragraph 5.4 for a Clearance, or in accordance with paragraph 6.3 for a Hot Line Order.
- b. Verify with the Switchmen at each location where switching was performed in the Agency system that all switching has been completed and that all Safety Tags and/or Hot Line Tags have been placed.
- c. State clearly to the foreign system dispatcher exactly what protection has been provided. This statement shall include the status of breakers, disconnecting switches, ground switches, reclosers, and other pertinent equipment, and the location of each Safety Tag and/or Hot Line Tag.

After the foreign dispatcher reads back the exact protection provided and states that he is satisfied that the protection meets the requirements, the Agency dispatcher will issue the interconnected system Clearance or Hot Line Order to the foreign dispatcher, documenting this action on the Switching Program Form and making an appropriate entry in the dispatcher's log. The foreign dispatcher is responsible for all switching on his system and for issuance of the Clearance or Hot Line Order to his Job Supervisor.

**13.1.5. OBTAINING FROM A FOREIGN SYSTEM** When an Agency Job Supervisor requires a Clearance or Hot Line Order which will require switching on a foreign system, he will arrange with the Agency dispatcher to request the appropriate switching on the foreign system. When all operations required on the foreign system have been completed, and all safety and/or Hot Line Tags (or equivalent) have been placed, the foreign dispatcher will so notify the Agency dispatcher. The Agency dispatcher will record this information on the Switching Program Form and satisfy himself that the protection thus provided is adequate. He will then receive an interconnected system Clearance or Hot Line Order from the foreign dispatcher, and document this action on the Switching Program Form so that the interconnected system action becomes a part of the Clearance or Hot Line Order issued to the Agency Job Supervisor. An appropriate entry shall also be made in the dispatcher's log.

**13.1.6. RELEASE** The interconnected system Clearance or Hot Line Order cannot be released until the Job Supervisor has released his Clearance or Hot Line Order. The release of the interconnected system Clearance or Hot Line Order will be by the dispatching office which received it. Release actions shall be documented on the Switching Program Forms and noted in the dispatcher's log.

### **13.2. DISPATCHING FOR FOREIGN UTILITIES**

There are specific situations where Agency transmission lines terminate in powerplant switchyards or substations owned and operated by Foreign Utilities, and other specific situations where a Foreign Utility's transmission lines terminate in Agency switchyards or substations. In these specific situations, Agency Dispatch Offices or Control Centers have been granted dispatching jurisdiction over certain lines and substations, or equipment located in these stations, under specific operating agreements with the Foreign Utilities. In these situations the Agency Dispatcher or Operations Supervisor shall, in accordance with this Bulletin and/or specific operating agreements or Memorandums of Understanding:

- a. Prepare the Switching Program.
- b. Direct the switching performed by the Agency or Foreign Switchman.
- c. Issue the Clearance or Hot Line Order to the Agency or Foreign Utility Job Supervisor who requested the action.

This Foreign Switchman may use the Foreign Utility's tags on equipment owned and operated by that Foreign Utility.

## **XIV. INSTRUCTIONS FOR POWER SYSTEM SWITCHING**

### **14.1. SWITCHING PROGRAMS**

**14.1.1.** Nonstandard abbreviations and terms shall be avoided. When Switching Programs are being transmitted orally, the instructions shall be given slowly to allow the Switchman receiving the message adequate time to write the complete instruction ON THE SWITCHING PROGRAM FORM or SWITCHING ORDER. Equipment identification shall be by name and number only, and need not be further identified by type and/or usage unless the device is difficult to identify.

**14.1.2.** Every Switchman receiving switching instructions shall use a Switching Program Form or Switching Order. All switching instructions no matter how simple, shall be written in exactly the same sequence as transmitted by the Operations Supervisor with special emphasis on the operation to be performed and on the correct identification of the device. After receiving and writing the instructions, the Switchman shall read them back to the Operations Supervisor slowly enough to enable the Operations Supervisor to verify that the correct instructions were received and correctly recorded. No switching shall be performed until the Operations Supervisor has verified all items of the written instructions. The verified written Switching Program Form or Switching Order shall be carried and referred to by the Switchman throughout the entire operation. Before each operation is performed, the Switchman shall doublecheck the instructions to make certain he is at the correct device and that he understands what action is to be done. After performing each operation, and before proceeding with the next step of the switching instructions, he shall check the device to see that it operated properly, then complete the Switching Program Form or Switching Order as applicable.

**14.1.3.** When the switching operation has been completed, the Switchman shall report to the Operations Supervisor, stating the time each operation was completed.

**14.2. SWITCHMAN'S RESPONSIBILITY** The Switchman shall be responsible for:

**14.2.1.** Checking to see that all blades are completely open or completely closed on a gang-operated disconnect switch after it has been operated and then, if possible, locking it in the position called for in the instruction.

**14.2.2.** Check to see that all single-pole disconnect switches are either completely open or closed and latched as directed by the instruction.

**14.2.3.** Checking the position indicators on circuit breakers to see that they correspond with the operation called for. Do not rely on the position indicating lights on the control board.

**14.2.4.** Checking all blades for proper position and seeing that the operating handle is locked, when instructions are to "Check open" or "Check closed" disconnect switches.

**14.2.5.** Checking the position indicator on the voltage regulator—rather than the remote indicator—for neutral position when bypassing this equipment.

**14.2.6.** Checking the operation indicators on all interrupter units when practicable, as well as the air-break blades, to see that they correspond with the operation called for.

**14.2.7.** The Switchman performing the switching operation shall not proceed further with the switching detailed on the Switching Program Form if:

- a. He does not clearly understand the instruction;
- b. He believes the instruction is incorrect;
- c. At any point in the operations an unexpected relay or breaker action occurs; or
- d. He finds a device in a position other than assumed by the Operations Supervisor when the instructions were issued.

If any of these conditions are encountered, the procedure shall be rechecked with the Operations Supervisor before proceeding further.

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