

PURPOSE:

Define the procedure to be followed to ensure the safe and reliable switching and operation of the PRPA portion of the Bulk Electric System (BES) and to outline the communication process of any Operating Instructions issued or received, to ensure everyone involved has a clear understanding of what is expected to happen and diminish any miscommunication.

IMPLEMENTING PARTIES AND ASSIGNED RESPONSIBILITIES:

This procedure is applicable to:

- PRPA PSO-Transmission (hereinafter "PSO") who is responsible for directing all switching on the PRPA portion of the BES.
- Any PRPA personnel that switches on the PRPA portion of the BES.

ASSOCIATED ITEMS:

SCADA System

Power System Switching Procedure



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PREFACE

Throughout the Platte River Power Authority system all switching; placement, issuance, receipt, release, and removal of Clearances and Hot Line Orders; establishment of Special Conditions; and all other operations associated with the Platte River Power Authority power system are to be performed by Authorized Personnel. This document is established to aid in accomplishing these operations as promptly as possible with maximum safety to personnel and equipment and with minimal chance for error.

A basic principle pertaining to power system operation is that the length 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 scheduled time.
- b. The crews will be ready to start work at the scheduled 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 practical or necessary.
- e. Delays such as shift changes and lunch periods shall not unduly impede the return of equipment to normal.

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I. INTRODUCTION AND PURPOSE

- 1.1. The complexity and interconnected nature of the Platte River Power Authority system requires emphasis on performance of power system operations in a uniform, and highly disciplined manner.
- 1.2. The guidelines contained herein establish broad operating criteria, which are mandatory and shall be complied with throughout the Platte River Power Authority system. Within these guidelines, Platte River Power Authority will instruct all personnel in the proper use of these guidelines.
- 1.3. This document will be reviewed, revised and/or updated as required by the Platte River Power Authority Power System Operations Department.
- 1.4. In an emergency, Authorized Personnel may modify or suspend any of these guidelines temporarily as may be considered necessary to permit proper handling of the specific emergency. However, in handling such emergencies, safety of personnel and protection of equipment shall be given paramount consideration.
- 1.5. The successful application of Platte River Power Authority procedures developed from these guidelines depends upon their being thoroughly understood, properly applied, and strictly adhered to.
- 1.6. PHILOSOPHY OF CLEARANCE PROCEDURES. The following principles, whether or not they are specifically addressed in this document, are considered basic to the safe operation of the interconnected power system:
 - 1.6.1. The priorities involved in applying clearance procedures are:
 1. Physical safety of employees and the public.
 2. Integrity and reliability of the power system.
 3. Protection of equipment.
 4. Service to the customer.
 - 1.6.2. Clearances, Hot Line Orders, Special Work Permits, and Danger Tags are provided to protect personnel; Special Conditions are applied to protect equipment.

- 1.6.3. Throughout the Platte River Power Authority system, all switching, placement, issuance, receipt, release, and removal of Clearances, Hot Line Orders, and Special Conditions; establishment of Special Work Permits; and all other similar activities associated with interconnected power system operations shall be performed by Authorized Personnel.
- 1.6.4. All switching operations shall be performed by exercising the fundamental principle: "Start with the correct procedure and follow it exactly," and can best be accomplished by the following:

THE SIX BASIC STEPS IN SWITCHING

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

II. DEFINITIONS

- 2.1. Authorized Personnel: personnel who have been trained and certified to perform the action being authorized. When certified, names shall be entered on the official lists of authorizations. Power System Operations shall maintain the authorization list.
- 2.2. Clearance: statement with documentation from the PSO to the Job Supervisor declaring that the equipment to be worked on has been deenergized and isolated from hazardous sources of energy.
- 2.3. Emergency:
 - a. Facilities are in such a condition as to be a hazard to the public, Platte River Power Authority personnel, or equipment
 - b. There is a power outage to customers, which could be hazardous to life or property.
 - c. Any abnormal system condition that requires automatic or immediate manual action to prevent or limit the failure of transmission facilities or generation supply that could adversely affect the reliability of the Bulk Electric System.
- 2.4. Equipment: any machine, device, or apparatus, either electrical or mechanical, including electrical circuits or transmission lines.

- 2.5. General Switching: 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.
- 2.6. Hot Line Order: statement with documentation from a PSO to a Job Supervisor that all automatic reclosing features have been disabled and the equipment will not be re-energized without the prior approval of the Job Supervisor. This allows specific work to be done on or near a line or other equipment without requiring that it to be deenergized. The equipment is to be considered energized.
- 2.7. Interconnected System Clearance: (ICS/CLR) is identical to “Source of Power Clearance” (SOP/CLR) in that the point(s) of protection are issued to or by an entity other than PRPA-Transmission.
- 2.8. Job Supervisor: any person authorized to request, receive, and release Clearances and/or Hot Line Orders and who is charged with the responsibility for the job.
- 2.9. PSO: Platte River Power Authority Power System Operator-Transmission
- 2.10. Clearance Procedure: the method which shall be followed in requesting, placing, issuing, transferring, releasing, and removing a Clearance.
- 2.11. Special Condition: an unusual, temporary condition pertaining to equipment that 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.
- 2.12. Special Work Permit: a statement which formalizes and documents the preparation and coordination between Platte River Power Authority and non-Platte River Power Authority personnel for Clearances and Hot Line Orders to facilitate work by non Platte River Power Authority forces on or near Platte River Power Authority power facilities.
- 2.13. Stations:
- Supervisory Controlled Station: any station either manned or unmanned which is normally operated from a remote location.
 - Unattended Station: any station not normally manned.

- 2.14. Switchman: personnel trained and authorized to perform switching and tagging operations.
- 2.15. Workman: personnel trained and authorized to inspect, service, repair or otherwise be in contact with equipment.

III. GENERAL RESPONSIBILITY AND AUTHORITY

- 3.1. Platte River Power Authority has the responsibility to ensure that all portions of this procedure are:

- Understood by all concerned
- Properly applied
- 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 are to be maintained. The appropriate supervisor shall determine through training, performance, or other acceptable evidence which persons are qualified to request, issue, or receive Clearances or Hot Line orders or to perform switching or other operations within the system. It is the responsibility of each employee to limit his activities within his authorization. A list shall be maintained of personnel, other than Platte River Power Authority personnel, who are qualified to perform switching operations at the request of the PSO.
- 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 Platte River Power Authority employees or employees of other utilities deemed qualified 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 they are to perform.
- 3.5. Communicating Switching Orders between PSO and Switchman

Once dialog has been established between the PSO and the authorized personnel responsible for switching, the following guidelines will be adhered to. These guidelines will be followed when directing switching for Clearances, Hot Line Orders or General Switching. These guidelines will be followed in the same manner when communicating

with other utilities with regards to the “Interconnected System” Clearance, Hot Line Order and General Switching process.

All communication between the PSO and switchman will be done in a clear and concise manner in accordance with the *PRPA Operating Instruction Procedure - Transmission*:

- The PSO will verify that the switchman is in place and ready to switch.
- The PSO will read only those switching steps at that particular station that are to be performed in the next switching sequence.
- The switchman will read the switching steps back to the PSO.
- The PSO will confirm that the steps were read back correctly and direct the switchman to proceed with the switching steps as required or reissue the switching steps if the repeated information is incorrect or if requested by the switchman.
- The switchman will acknowledge the switching steps that have been instructed.
- Once the switching steps are performed as directed, the switchman will contact the PSO and report that the switching steps have been completed and will read the steps in order of completion with the times that the steps were performed and any associated tag numbers.
- The PSO will read the switching steps back to the switchman.
- The Switchman will confirm that the steps were read back correctly.

Acknowledging safety to personnel and equipment, nothing in the above guidelines is to be misconstrued as to hamper the open lines of communication between the PSO and the switchman.

IV. MATERIALS FOR USE WITH THESE GUIDELINES

4.1. SWITCHING PROGRAM FORM

4.1.1. **PURPOSE.** The Switching Program Form formalizes and documents each step in the process of issuing and releasing Clearances and Hot Line Orders, placing and removing Special Conditions, and performing General Switching. A Switching Program Form is shown in Figure 1.

4.1.2. **APPLICATION.** A Switching Program Form, where applicable, shall be completed by the PSO and checked by a second qualified person, when possible, for all operations requiring a Clearance, Hot Line Order, Special Condition, or General Switching. It is desirable that copies of the appropriately filled-in Switching

Program Form be made available, in advance, for reference and use by the Switchman during the switching and tagging operation. The PSO may provide the information by available communication channels to the Switchman, who will write all information on the Switching Program Form pertinent to the location and repeat back the orders. The master Switching Program Form used by the PSO shall 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 document 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 supplement to the log.

- 4.1.3. NUMBERING. Each Switching Program Form shall be given a serial number. Separate series of consecutive numbers will be used for each type of switching program. The form shall indicate whether the action is a Clearance, Hot Line Order, Special Condition, 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. 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 proceeding with the Switching Program. The location of the Safety Tags will define the boundaries for Clearances and Hot Line Orders.
- 4.2. The PSO shall log all placement action and all removal action in the PSO's Electronic Log.
- 4.3. The PSOs shall keep themselves informed concerning the status of all current switching programs. To accomplish this the PSO shall use the following procedures:
 - a. Maintain an accessible file on each type of Switching Program.
 - b. The PSO shall record outstanding Clearances and Hot Line Orders in the PSO shift turnover portion of the PSO's Electronic Log at each shift turnover.
- 4.4. SAFETY TAGS. These tags are used in conjunction 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 (Figure 2) shall be used. 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 in an adjacent operating area.

- 4.5. HOT LINE TAGS. These tags are used in conjunction with Hot Line Orders to prevent reenergizing equipment, as discussed in section VI. Only approved prenumbered and marked yellow plastic-type Hot Line Tags (Figure 3) shall be used for this purpose. The front side of the tag is to be completed in permanent marking. The tags shall be prenumbered at each substation.
- 4.6. SPECIAL CONDITION TAGS. These tags are used to designate special conditions affecting equipment as discussed in section VII. Only approved tags (Figure 4) shall be used for this purpose. The tag is to be numbered and completed.
- 4.7. DANGER TAGS. These tags (Figure 5) may be used as discussed in section VIII.
- 4.8. SPECIAL WORK PERMIT FORM. The Special Work Permit Form (Figure 6) formalizes and documents the preparation and coordination between Platte River Power Authority and non-Platte River Power Authority personnel for Clearances and Hot Line Orders to facilitate work by contractors and non-Platte River Power Authority construction or maintenance forces on or near Platte River Power Authority power facilities. This form provides:
 - a. A listed protective action (Clearance or Hot Line Order) on a specified Platte River Power Authority 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 defines 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 Platte River Power Authority 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. CLEARANCE PROCEDURE

- 5.1. PURPOSE. Clearance Procedures 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, the Job Supervisor shall obtain a Clearance before starting work. Clearances are accomplished by systematically isolating the equipment from all sources of hazardous energy (electrical, mechanical and hydraulic) and attaching Safety Tags (Figure 2) to operating 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 Safe 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 PSO

- Is responsible for authorizing and issuing Clearances and Hot Line Orders on all equipment affecting the power system.
- Shall issue all Clearances and Hot Line Orders on equipment which require protection at points distant from each other, such as on transmission lines.
- Is responsible for preparing a correct Switching Program and properly directing the switching and related operations in the placement and removal of the protection.
- Is responsible for the operation of all system equipment that may be controlled by Supervisory Control.

5.2.2. Switchmen

- Shall do all switching and operating of controls and isolating equipment such as circuit breakers, disconnecting switches, (not controllable by the PSO VIA Supervisory Control) and shall place locks where practical and Safety Tags where required by the Switching Program, or as directed by the PSO.
- The Switchman placing the protection is responsible for it being properly executed.

5.2.3. JOB SUPERVISOR

- Is responsible for CHECKING the protection provided to ensure it is adequate to carry out the assigned work in a safe manner. NO WORKMAN WILL BE REQUIRED TO WORK ON A JOB OR PIECE OF EQUIPMENT THAT THE JOB SUPERVISOR OR WORKMAN CONSIDERS UNSAFE. The Job Supervisor must request any additional protection as necessary to make the job safe.
- Shall notify each person working under the Clearance of the conditions and extent of the Clearance before work is started. The Job Supervisor 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 working under his Clearance are in the clear, that all temporary protection such as Danger Tags and personal grounds are removed, and that any unusual conditions are reported to the PSO.

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, and opening potential or other transformer secondary's where these could be inadvertently energized from the low-voltage side. These devices shall be tagged and locked wherever means for locking is provided. Once the Job Supervisor has received the clearance, ground switches may be closed within the parameters of the clearance. The equipment to be worked on should be free of Safety Tags to the extent 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. Only authorized personnel shall request a Clearance from the PSO or Outage Coordinator. Requests must comply with regional guidelines for requesting work. See "Emergency" definition. All required information must be given to the PSO to complete the top portion of the Switching Program Form.
- 5.4.2. Every person involved in placing, issuing, releasing and removing 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 proceeding with the switching.

- 5.4.3. 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 PSO shall prepare to issue the Clearance to the Job Supervisor. Before issuing the Clearance, the PSO shall verify with the Job Supervisor that the points of protection are adequate for the work to be performed.
- 5.4.4. After the above requirements have been fulfilled, the PSO shall issue the Clearance to the Job Supervisor. This statement shall correctly identify the equipment requested and what has been Safety Tagged. In the case of a transmission line it must be given its proper designation including voltage level and all terminals between which the Clearance is given. The Job Supervisor receiving the Clearance shall repeat to the PSO the protection provided. The PSO shall then log the Clearance information.
- 5.4.5. Any point of protection that is used as a common point for two adjacent clearances shall be double tagged with Safety tags.
- 5.5. OPERATING EQUIPMENT UNDER CLEARANCE. Within the perimeter of the Clearance, the Job Supervisor holding the Clearance may allow workmen to operate equipment for tests and adjustments. The Job Supervisor is responsible to see that the equipment is returned to the original position; that is, opened or closed, on or off before the Clearance is released.
- 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 test 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 PSO and request that a check or test operation is made. The Job Supervisor shall explain 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 PSO, 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 PSO 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 PSO, Job Supervisor, and Switchman.

5.7. RELEASING A CLEARANCE

- 5.7.1. Upon completion of the work and after removal of all closed ground switches, personal grounds and other devices attached to the equipment by workmen, the Job Supervisor who received the Clearance shall personally release the Clearance by reporting to the PSO. The Job Supervisor shall state that all personnel are clear of the equipment that all personal grounds 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, the Job Supervisor will so state giving full particulars. The PSO will so note the release on the Switching Program Form and notify the stations involved.
- 5.7.2. In the event that the Job Supervisor who received the Clearance is unavailable for an unacceptable period of time or in an emergency, the Job Supervisor's immediate supervisor shall assume full responsibility for the Clearance, including its release. This information shall be documented on the Switching Program Form.
- 5.7.3. The PSO shall log the pertinent information regarding the releasing of the Clearance in accordance with detailed instruction.
- 5.7.4. The Switching Program shall not be considered complete until all field Safety Tags have been removed and accounted for.

5.8. RESTORING EQUIPMENT TO NORMAL

- 5.8.1. The PSO 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 PSO, 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 of Safety Tags shall be recorded in the Log.
- 5.9. IDENTICAL CLEARANCE. When it is desired to issue two or more concurrent Clearances on the same equipment requiring the same protection, the PSO 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.) for each additional Clearance, should be used in the column "No. _____. 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 column "Released by _____" of the PSO'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 PSO 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 final release of his Clearance upon completion of the work.
- 5.11. USE OF DANGER TAGS WITHIN A CLEARANCE. Danger Tags (paragraph 4.6.) 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 extend or alter the perimeter of an existing Clearance, the Job Supervisor shall request a new Clearance with the desired points of protection. The PSO will write 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 PSO will issue the new Clearance to the Job Supervisor who will then release his original Clearance. The PSO will write the switching steps, and/or instructions for the removal of all Safety Tags associated with the original Clearance. In the event that the original clearance will need to be re-installed in a short period of time, clearances may overlap to allow the original clearance to remain in place as long as operations and maintenance agree on all tagged points. *If there is any concern by either system operations or substation maintenance reference the CHANGE OF CLEARANCE PERIMETER procedure above.*

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. In addition Control switches (local and/or supervisory) for breakers and circuit switchers are also tagged with PRPA HLO tags. A lit HLO light shall be considered the same as an HLO tag.

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 or circuit switchers involved in the Hot Line Order. This paragraph does not prohibit communications or relay personnel from working on microwave, fiber channels, or other circuits, if such work will not prevent the phase and ground protective relays from tripping any circuit breaker or circuit switcher involved in the Hot Line Order.

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 the same as outlined for a Clearance under "Responsibility and Authority," paragraph 5.2.

6.3. PLACING A HOT LINE ORDER

6.3.1. Only authorized personnel shall request a Hot Line Order from the PSO. Requests must comply with regional guidelines for requesting work. See "Emergency" definition. All required information must be given to the PSO to complete the top portion of the Switching Program Form.

6.3.2. The PSO 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 proceeding with the switching.

- 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, and all control switches (local and/or supervisory) for circuit breakers involved have been tagged with the proper Hot Line Tag, the PSO 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 relay 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 hand reset switch with the proper Hot Line Tag. In issuing the Hot Line Order, the PSO 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. The Job Supervisor receiving the Hot Line Order shall repeat back to the PSO the protection provided. The PSO shall log the Hot Line Order information.

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 PSO shall determine that the following condition has been satisfied before ordering the associated breakers closed:
 - a. The Job Supervisor holding the Hot Line Order has been contacted and has stated that it is safe to reenergize the circuit.
- 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 the work area can be safely reenergized,
 - Inform the PSO of the details.
- 6.4.3. PSO confirms that all personnel are in the clear and line may be re-energized. PSO shall remove the Hot Line Order tags by SCADA and close associated breakers by SCADA energizing transmission line. PSO shall restore Hot Line Order tags by SCADA to associated breakers.

- 6.4.4. When a Switchman is ordered by the PSO to close a circuit breaker, which has tripped while under a Hot Line Order, the switchman shall:
1. Remove the Hot Line Tag from the control switch and operate the control switch to close the circuit breaker.
 2. After the circuit breaker has closed, the switchman shall replace the Hot Line Tag on the control switch if the Hot Line Order is to be continued
 3. Record pertinent information of the trip and closure in the Station Log.

6.4.4 After a circuit under a Hot Line Order has tripped and has been closed, the PSO shall immediately inform the Job Supervisor that the circuit breaker(s) 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 PSO, the Job Supervisor is to be notified before either operation is attempted. The Job Supervisor shall immediately order all personnel clear of the equipment until the PSO advises:
- that the operation is complete,
 - reports the status of the equipment to the Job Supervisor
 - advises the Job Supervisor it is safe to resume work.

6.5. 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.

6.6. REMOVING A HOT LINE ORDER

6.6.1. Upon completion of the work for which the Hot Line Order was issued , the Job Supervisor shall release the Hot Line Order by reporting to the PSO.

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

- 6.6.3. The PSO shall log the pertinent information regarding the release of the Hot Line Order in accordance with detailed instructions. The PSO will then proceed to restore the line to normal status in accordance with instructions in paragraph 5.8.

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 PROTECTION OF PERSONNEL. 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 periodically 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 PSO as soon as practical. The PSO shall determine if the Special Condition procedure is applicable, and the PSO will issue the necessary instructions.
- 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. Special Condition Tag shall include a serial number issued by the PSO. Alternatively, the tag may be placed in a conspicuous location on the equipment. Placement of all Special Conditions shall be documented on a Switching Program Form and entries in the PSO logs.
- 7.4. **REMOVING PROCEDURE.** When the condition requiring a Special Condition no longer exists, the PSO shall order the removal of the Special Condition Tags. Such removal shall be documented in the PSO logs.

VIII. DANGER TAGS

- 8.1. **PURPOSE**
 - 8.1.1. Danger Tags (Figure 5) may be used within the perimeter of an existing Clearance, for the protection of workmen and/or equipment. Danger Tags may also be used without a Clearance to prevent the operation of electrical, mechanical, or hydraulic equipment not directly connected with the operation of the power system.
 - 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.

- 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 PSO before operating, deenergizing, or placing Danger Tags on equipment that might affect power system operations.
- 8.3.3. The Job Supervisor (or authorized workman) shall sign and date each Danger Tag that is placed. The Job Supervisor (or authorized workman) shall keep a record of the location of all Danger Tags placed.
- 8.4. REMOVING DANGER TAGS. When the work is completed, the Job Supervisor (or authorized workman) shall remove all Danger Tags placed, and shall return the equipment to the "as found" position. Equipment may be positioned otherwise with the concurrence or at the request of the PSO. Danger Tags shall be removed only by the person who signed, dated, and placed the tag. If it becomes necessary to remove the 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 PSO when Danger Tags are placed without a Clearance and removed from equipment that affects power system operations.

IX. TAGGING OF EQUIPMENT OPERATED BY SUPERVISORY CONTROL (SCADA)

- 9.1. When a Clearance, Hot Line Order, or Special Condition is issued on equipment that is operated by a supervisory control, which utilizes SCADA displays, the status of such equipment shall be positively indicated by means of an appropriate symbol displayed on all SCADA displays, which serve as the supervisory control point. If Clearance, Hot Line Order, and Special Condition placement or removal data is automatically logged and documented by means of the computer printout, these printouts will supplement the Switching Program Forms.

X. GENERAL SWITCHING

- 10.1. PURPOSE. General Switching is performed by 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. PROCEDURE. A Switching Program Form shall be prepared and checked, if possible, for each application of General Switching. The operations shall be directed by the PSO 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. A Switching Program Form is not needed for routine operation (not involving the operation of disconnect switches) of power plant, pumping plant, and switchyard equipment such as generators, pumps, compressors, etc.

XI. OPERATIONS ASSOCIATED WITH INTERCONNECTED SYSTEMS

- 11.1. INTERCONNECTED SYSTEM (ICS/ CLEARANCES AND HOT LINE ORDERS)

- 11.2. PURPOSE. To provide protection at defined point(s) of interconnection between Platte River Power Authority and other interconnected power systems.

- 11.3. DEFINITION. An ICS Clearance or Hot Line Order is a statement from one Operations office to another that switching has been performed on one system as a partial or complete requirement for a Clearance or Hot Line Order issued by the other Operations office. The Operations office receiving the ICS Clearance or Hot Line Order is responsible for all other switching if required and for issuing the Clearance or Hot Line Order.

- 11.4. RESPONSIBILITY. All ICS Clearances, Hot Line Orders and General Switching between interconnected systems, including Platte River Power Authority systems, shall be handled by PSO in accordance with the appropriate Operating Agreements.

- 11.5. ISSUANCE TO INTERCONNECTED SYSTEMS. When another system requires a Clearance or Hot Line Order that will require switching on the Platte River Power Authority system, the Job Supervisor will arrange with his Operations office to request an ICS Clearance or Hot Line Order from the Platte River Power Authority PSO. The PSO will then:

- a. Prepare a Switching Program Form clearly identified as “ICS,” and switching order 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 Switchman at each location where switching was performed on the Platte River Power Authority 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 external PSO exactly what protection has been provided. This statement shall include the status of the equipment requested, and what has been Safety Tagged and/or Hot Line Tagged. After the external PSO reads back the exact protection provided and states that he/she is satisfied that the protection meets the requirements, the Platte River Power Authority PSO will issue the Interconnected System Clearance or Hot Line Order to the external PSO, documenting this action on the Switching Program Form and making an appropriate entry in the PSO Electronic Log.
- d. When a Clearance is requested by a Non-PRPA entity that is under OSHA-1910-269 (lock-out/tag-out) rules and where their switching procedures mimic the OSHA rules.

PRPA’s procedure will be to:

- Place a safety tag and lock on the clearance points requested.
- ICS Clearance issued by PRPA.
- PRPA personnel will then place a unique PRPA numbered lock on the clearance point(s).
- The unique PRPA numbered lock key will then be given to the entity requesting the ICS/CLR.
- Once work is complete the requesting entity will return the unique PRPA numbered lock key to PRPA personnel who will remove the lock.
- ICS Clearance will then be released to PRPA.
- Remove safety tag and lock on the clearance points and return system to normal.

11.6.1. OBTAINING AN INTERCONNECTED SYSTEM. When a Platte River Power Authority Job Supervisor requires a Clearance or Hot Line Order, which will require switching on another system, he will arrange with the PSO to request the appropriate switching on the other system. When all operations required on the other system have been completed, and all Safety and/or Hot Line Tags (or equivalents) have been placed, the external PSO will so notify the Platte River Power Authority PSO. The Platte River Power Authority PSO will record

this information on the Switching Program Form and confirm that the protection thus provided is adequate. The PSO will then receive an Interconnected System Clearance or Hot Line Order from the external PSO, and document this action on the Switching Program Form so that the ICS/CLR or ICS/HLO becomes part of the protection for the Clearance or Hot Line Order issued to the Platte River Power Authority Job Supervisor. An appropriate entry shall also be made in the PSO Electronic Log.

11.6.2. RELEASE. The ICS Clearance or Hot Line Order cannot be released until the Job Supervisor has released his Clearance or Hot Line Order. The release of the ICS Clearance or Hot Line Order will be by the office that received it. Release actions shall be documented on the Switching Program Forms and noted in the PSO Electronic Log. No protection shall be removed or switching performed until all Clearances, including system Clearances and/or ICS Clearances have been verified released by the PSO.

XII. OPERATIONS ASSOCIATED WITH SINGLE POINT OF PROTECTION

12.1. SINGLE POINT OF PROTECTION (SPP) CLEARANCE

12.1.1. PURPOSE. To provide for the protection of all personnel using a single point of isolation from energized equipment.

12.1.2. DEFINITION. An SPP clearance must be used where a single point separates existing equipment operated by System Operations from equipment:

12.1.2.1 That is under construction that System Operations has no operational jurisdiction over.

12.1.2.2. Where one single point of protection will isolate the entire piece of equipment from energization.

12.1.3. RESPONSIBILITY. SPP Clearances shall be defined by the PRPA Job Supervisor in coordination with the PRPA PSO; they must confirm that a single point of clearance is required.

The Job Supervisor shall never request this type of Clearance when a piece of equipment can be encircled by points of protection as performed for a normal Clearance.

- 12.1.4. ISSUANCE OF A SINGLE POINT OF PROTECTION (SPP) CLEARANCE. Prepare a Switching Program Form clearly identified as “SPP Clearance,” and switching order in accordance with paragraph 5.4 for a Clearance.

XIII. INSTRUCTIONS FOR POWER SYSTEM SWITCHING

13.1. SWITCHING PROGRAMS

- 13.1.1. 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 instruction adequate time to write the complete instruction ON THE SWITCHING PROGRAM FORM. 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.
- i. In the process of performing “routine” switching, every Switchman receiving switching instructions shall use a Switching Program Form. Emergency switching instructions to switchmen in the field need not be documented on a Switching Program Form; however, all emergency switching orders with times performed shall be documented in the PSO Electronic Log by the PSO. All switching instructions, no matter how simple, shall be written in exactly the same sequence as transmitted by the PSO 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 PSO slowly enough to enable the PSO to verify that the correct instructions were received and correctly recorded. No switching shall be performed until the PSO has verified all items of the written instructions. The verified written Switching Program Form shall be carried and referred to by the Switchman throughout the entire operation. Before each operation is performed, the Switchman shall double-check the instructions to make certain to be at the correct device and to understand what action is to be taken. After performing each operation and before proceeding with the next step of the switching instructions, the switchman shall check the device to see that it operated properly, and then complete the Switching Program Form as applicable.
 - ii. When the switching operation has been completed, the Switchman shall report to the PSO, stating the time each operation was completed.

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

13.1.2. 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.

13.1.3. Checking to see that all single-pole disconnect switches are either completely open or closed and latched as directed by the instructions.

13.1.4. 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.

13.1.5. 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.

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

The Switchman performing the switching operation shall not proceed further if:

- a. The Switchman does not clearly understand the instructions;
- b. The Switchman believes the instruction is incorrect;
- c. At any point in the operations an unexpected relay or breaker action occurs; or
- d. The Switchman finds a device in a position other than assumed by the PSO when the instructions were issued.
- e. If any of these conditions are encountered, the procedure shall be rechecked with the PSO before proceeding.

XIV. **INSTRUCTIONS FOR SWITCHING MOTOR OPERATED DISCONNECTS**

When PRPA is faced with switching that requires the operation of an MOD, the situation will be reviewed by Power System Operations, System Maintenance and Engineering.

Issues to consider will include, but not be limited to:

- Personnel Safety
- Equipment Safety
- System Conditions and Configuration
- MOD Operating Capabilities

If all three departments agree that the MOD is capable of being operated energized for this one instance the MOD may be operated energized. If an agreement cannot be reached by the three departments, the MOD will always be operated de-energized.

XV. **INSTRUCTION FOR ENERGIZING TRANSFORMERS**

It is PRPA's practice, unless there are extenuating circumstances or emergency conditions, to energize all transformers from the high-side (strong source) in order to prevent in-rush current from causing a significant voltage excursion to the system. This condition is of particular concern when re-energizing the Fordham & Horseshoe Auto Transformers.

Logged Approval Required:

PROGRAM NUMBER 17-

Requested by & Date: _____	Required Date: _____	#VALUE!	Time: _____				
Job Supervisor: _____	Return Date: _____	#VALUE!	Time: _____				
Request Received by: _____	Emergency Return Time: _____						
Equipment Requested: _____							
Points of Protection: _____							
Request Type: _____							
<u>Work Description:</u>							
<u>Notes:</u>							
<u>Risk Assessment:</u>							
Risk Assessment Completed by : _____							
Notifications Made:	Email	Fax	Voice	Contact	Date	Time	PSO
Substation Maint:							
Peak/RC:				COS 1-			
WACM:							
PSCO:							
TSG&T:							
Ft. Collins:							
Loveland:							
Longmont:							
Estes Park:							
Studies Engineer:							
Pre-Schedulers:							
Other:							
Issued:	Order Number	Issued To	Issued By	Date	Time		
Released:	Order Number	Released By	Released To	Date	Time		

Issue Statement:

At time of : _____

Issuing : _____

Number: _____

Issued to: _____

On: _____

Points of Protection are:

Release Statement:

At time of : _____

Releasing: _____

Number: _____

Released By: _____

On: _____

All men and equipment are in the clear, personal grounds
have been removed and the equipment is ready for service.



FRONT



BACK



FRONT



BACK



PLATTE
RIVER
POWER
AUTHORITY



SPECIAL CONDITION TAG NO.

SPECIAL CONDITION ORDER NO. _____

EQUIPMENT _____

PLACED BY _____

DATE & TIME _____

REMOVED BY _____

DATE & TIME _____

REMARKS _____

90-001950



WATER
GAS &
ELECTRICITY
AUTHORITY

DANGER

**HANDS
OFF**

**DO NOT
OPERATE**

SIGNED BY _____

DATE _____

30-007896

Version	Date	Action	Change Tracking
1	GF	Original date unknown	New
2	5/05/06	Transfer to PRPA template format.	Reformat
3	2/12/07	Added Single Point(s) of Protection Clearance Procedure	Update
4	5/29/07	No Changes	Review
5	5/16/08	Update/ minor changes	Review
6	5/12/09	Added Effective Date and Acronyms Made minor changes.	Review and Update
7	4/26/10	No Changes	Review
8	6/2/10	Minor Change	Update
9	9/9/10	Resolved Incorrect Page Numbering	Update
10	8/30/11	Removed Work Permit Section, Linked TOC, minor procedural clarifications	Review and Update
11	8/23/12	Review, Definitions Update, Section 15 Added	Review and Update
12	10/29/12	Modification to Section 15	Update
13	8/22/13	Annual Review	Review
14	8/20/14	Annual Review, Remove Operations Assoc. with Non PRPAMaintenance Forces Section, Minor Changes	Review and Update
15	8/11/15	Annual Review, Minor Updates	Review and Update
16	8/24/15	Annual Review, Changed 5.4.3 and 5.4.4	Update
17	8/23/16	Annual Review, Minor Updates	Review and Update
18	8/22/17	Annual Review, Updates including Switching Forms, Added section XV., Added to 5.12 on overlapping clearances for short duration	Review and Update
19	7/24/18	Annual Review, Minor Updates	Review and Update
20	8/21/19	Annual Review, no changes	Review