



YUKON ENERGY CORPORATION
Power System Work Standards



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MESSAGE FROM YUKON ENERGY

Working on or near the Yukon Energy power system involves risks to workers, system security, and customer supply. However, complying with appropriate work standards, procedures and work methods will help minimize those risks and allow workers to work safely.

The Power System Works Standards (PSWS) is designed to complement and support other Yukon Energy safety standards.

All Yukon Energy workers working on or near the Yukon Energy power system must be fully informed prior to starting work.

Your continued commitment to safe work practices will help to ensure both worker safety and the efficient operation of the power system.

SECTION 100 - HOW TO USE THIS DOCUMENT

101 Purpose

The Yukon Energy Power System Work Standards provides Yukon Energy Corporation (YEC) workers with standards for establishing conditions on the power system that will, when combined with appropriate work standards, procedures and methods, provide a safe work area. Before starting any work on the power system, workers must obtain permission from the YEC System Control Center.

NO PERMISSION, NO WORK.

NOTE - This document provides a process for establishing required power system conditions only. In addition to obtaining permits, workers must implement barriers to protect against all other hazards identified in the job planning process.

102 Scope

Power System Work Standards (PSWS) apply to all workers authorized to work on and around YEC power system facilities and/or auxiliary control and communication equipment.

103 Document Compliance

Power System Work Standards comply with the following:

- Alberta Electrical Utility Code (AEUC);
- Yukon Occupational Health & Safety Act;
- Yukon Occupational Health & Safety Regulations;
- Yukon Energy Corporation Health & Safety Manual;
- Yukon Energy Corporation Safe Job Procedures, Safe Work Practices, policies, and programs (as part of YEC Safe Standards Manual).

104 Definitions

Around - In such proximity to equipment as to give rise to the possibility of encroaching on the limits of approach.

Charged – Containing stored energy – mechanical, electrical, or otherwise.

Condition Guarantee – a verbal or written guarantee given by the Person-In-Charge that a particular isolating device has been manipulated, verified and appropriately tagged (or tag removed), or a prescribed operation or act has been completed. This is not a work permit.

Device – A type of electrical equipment used as a switch or control mechanism (e.g., gang switch, circuit switcher, recloser, etc.).

Disable – To make a device inoperable.

Do Not Operate; Self Protection Tag – Tag used to clearly identify equipment as not-operable; for any reason.

Also see, YEC Safe Work Practice SWP-013; Do Not Operate – Self Protection Tag.

Enable – To make equipment or device operational.

Energized – Electrically connected to a source of potential energy, or electrically charged so as to have a potential difference from that of earth. Equipment must be considered energized unless confirmed isolated and/or grounded.

Equipment – Equipment of every kind and description used in the generation, transformation, distribution, delivery or use of electrical power or energy. Also includes the auxiliary control and communication equipment used to manage the delivery and use of electrical power.

Generating Station (GS) - The generating equipment operated by Yukon Energy and used to supply distribution and/or transmission facilities.

Isolated¹ – To disconnect completely a device or circuit from other devices or circuits, separating it physically, electrically and mechanically from all sources of electrical energy.

Locked – Physically secured with a keyed padlock.

Operating Authority – The person designated by YEC to make decisions affecting operations of the power system.

Operating Interface Point – Location on the power system separating the responsibilities of respective Operators-in-Charge. Operating interface points are identified on a single line diagram (SLD). See Appendix A.

Operator-in-Charge (OIC) – The worker designated by the Operating Authority to coordinate control of the power system or a portion thereof, in accordance with the requirements of established safety standards and operating standards and procedures.

OIC-Administered Switching – Switching directed by the OIC, in accordance with switching orders developed by the OIC.

Permit – Document that defines and provides permission to work under established power system conditions.

Permit Holder – The worker to whom a permit has been issued.

Person-In-Charge (PIC) – The worker responsible for all workers in a work group, or groups, working on or around the same related power system facilities. When working alone, the worker is considered the PIC.

Potential – Voltage, in the context of electricity.

Power System – All electrical facilities above 750 V that are part of the transmission and distribution systems.

¹ Source – AEUC; 5th Edition - 2016

Release – The surrender of the permit.

Return to Normal – Restoration of the power system or equipment to a normal operating state.

Safe Work Area – A defined area on or around the power system equipment where conditions have been established that will, when combined with appropriate work standards, procedures and methods, eliminate or control hazards.

SCADA Tag – Software tags applied to the SCC SCADA system to alert the OIC and prevent the operation of devices by those systems.

Site Coordinator – The worker designated to coordinate the activities of all workers and work groups required to conduct activities on/near power system facilities and equipment.

Substation – Part of a transmission line that is not a transmission circuit and includes equipment for transforming and switching electric energy.

Switching – Any action initiated by a worker that changes the operating state of devices associated with power system equipment or circuits.

Switching Diagram – Simplified electrical representation of the power system or a part thereof; includes SLD and switching maps. Interim SLD and maps are also included.

Switching Order – Documentation that describes the specific switching sequence required to place power system devices in a desired operating state. If only one switching step is required, the tag may be the switching order.

Switch-person – A worker that is deemed trained and competent to operate electrical equipment and performs switching and tagging of devices under the direction of or with the permission of the OIC.

System Security – The integrity of the power system; maintained by identifying the next contingency related to the work being considered that could impact power system operations and/or customer supply.

Transfer of Authority – Formal transfer of duties and responsibilities from:

- One OIC to another;
- One permit holder to another with permission of SCC OIC.

Worker²– For the purposes of this PSWS document, any person employed by, or contracted to YEC, who is authorized as, but not limited to, one or more of the following:

- Qualified Utility Worker;
- Utility Worker;
- Utility Tree Trimmer ;
- Utility Tree Worker; **NOTE** - Utility Tree Trimmers and Utility Tree Workers **DO NOT** automatically assume Utility Worker authorizations.

Worker-Administered Switching – Switching performed by a worker who has received permission from the OIC to establish the power system conditions required for a safe work area.

² Also see, Alberta Electrical Utility Code – Section 0; Object, Scope, and Definitions

SECTION 200 - LEVELS OF AUTHORITY & RESPONSIBILITIES

201 Operating Authority

The Operating Authority has overall responsibility for the operation of the transmission system, distribution system or isolated generation stations as applicable, and is responsible to make sure the OIC responsibility is assigned³.

YEC is the utility owner and has designated the Director, Operations (or their designate) as the Operating Authority for **ALL** Yukon Energy controlled transmission, distribution and generation facilities, **>750 Volts**. This also includes the auxiliary control and communication equipment used to manage the delivery and use of electrical power.

No work, operation, switching, isolation, connection will be performed without the approval and direction from the OIC.

202 Operator-In-Charge (OIC)

The OIC is responsible for the operation of all transmission, distribution, and generation systems rated 750V and above, **excluding** electrical equipment that is part of buildings operating systems (i.e. building lighting, heating etc.)

The OIC is responsible to:

- Coordinate the day-to-day operation of the transmission, distribution or generation system, as applicable, in compliance with approved standards and procedures;
- On request, establish power system conditions that will, when combined with appropriate work standards, procedures and methods, provide a safe work area;
- Issue permits as required for all work on the transmission, generation or distribution system, as applicable, including the attachment and detachment of facilities; and
- Forward operational documentation to Records management for retention.

The OIC is also responsible for notifying adjoining Operating Authorities of:

- any operation of an interface point;
- the re-defining of the location of an interface point;
- changes in operating conditions that impact their system.

203 Person-In-Charge (PIC)

When more than one worker is required to work on or near the same power system equipment at any one location, one of the workers must be designated as the PIC for that work group. The PIC must be identified to the respective OIC when requesting permits or access to facilities.

³ OIC is typically the SCC System Operator on shift.

The PIC or designate will instruct all workers under their direction regarding the work to be performed.

The PIC must stop work and promptly notify the OIC of the facilities in the event of an unscheduled occurrence or incident that may affect:

- personnel safety, or
- electrical system security, or
- continuity of supply to customer loads.

Work will be stopped if the PIC has reason to suspect that:

- any part of the work has not been properly planned;
- any worker is not authorized or is unable to carry out duties in accordance with work plans;
- conditions have changed such that work may unduly jeopardize personnel safety, power system security or customer supply.

Permits will be issued to the PIC of a work group.

The PIC must not take out any more permits than can be safely supervised.

204 [Site Coordinator](#)

A Site Coordinator must be designated when more than one work group or two or more Persons-In-Charge are working on a project. The Site Coordinator must be identified to the OIC and all workers on the project.

The Site Coordinator may be a PIC of a work group.

The Site Coordinator will have the same responsibilities as the PIC plus the following:

- coordinating all work on the project;
- making sure all operating authorities and workers clearly understand the limits or bounds of the project;
- participating in overall job planning and safety analysis;
- submitting project work plans to respective Operating Authorities as requested;
- communicating to all parties involved any changes to the work plans;
- limiting unauthorized access to the project site;
- authorizing any operation or work performed on equipment within the limits of the site.

Permits can be issued to the Site Coordinator.

The Site Coordinator must not take out any more permits than can be safely supervised.

205 Permit Holder

The permit holder is normally the PIC of a single work group or multiple work groups, as applicable. The permit holder must have one of the following qualifications:

- Qualified Utility Worker for Guarantee of Isolation;
- Qualified Utility Worker, Utility Worker, Utility Tree Trimmer or Utility Tree Worker for Hold Off Permits.
- Qualified Utility Worker or Utility Worker for Test and Operate and Control System Permits

Also see, Alberta Electrical Utility Code – Section 0; Object, Scope, and Definitions.

The permit holder is responsible to:

- Request and hold the permits that will, when combined with appropriate work standards, procedures and methods, provide a safe work area;
- Review and sign off permits to ensure that they provide a safe work area;
- Notify the OIC prior to starting work;
- Provide permission to all workers and work groups under their direction to work under the permits held;
- Stop work and promptly notify the OIC in the event of any unscheduled occurrence or incident related to the power system that may affect:
 - Worker safety;
 - Power system security; or
 - Continuity of customer supply; and
- Release all permits to the OIC when the work is completed.

206 Switch-person

The Switch-person must be a Qualified Utility Worker who is responsible to:

- At the direction of or with the permission of the OIC, perform the switching in accordance with the switching order.

207 Workers

Workers are responsible to:

- Comply with all standards provided in the Power System Work Standards document;

- Contact the OIC prior to switching on the system;
- Inform OIC when connecting or disconnecting equipment to/from the system.

SECTION 300 - PREPARING TO ESTABLISH REQUIRED CONDITIONS

301 Process

In preparing to establish the required conditions to work on or near the power system, workers must complete the following steps, as applicable:

- Obtain current SLD or switching diagram(s);
- Determine, in consultation with OIC, the power system conditions required to accommodate the work;
- Request permission from the appropriate OIC to establish those conditions using the System Switching Information (SSI) form - see section 803;
- Receive permission to establish required conditions through OIC-administered switching (or worker-administered switching);
- Develop and/or review switching orders;
- Establish an on-site means of communication with the OIC.

302 Determining Required Conditions

The first step in planning work on or near the power system is to determine the conditions that will, when combined with appropriate work standards, procedures and methods, provide a safe work area.

Conditions and Permits required.

302.1 Isolation from all sources of potential above 750 V -

- Requires a Guarantee of Isolation Permit (Section 501); or, Worker Administered Protection (Section 505);
- Allows work on isolated equipment;
- May require application of grounds by a Qualified Utility Worker;
- May require Worker-Administered Switching;
- May require a Condition Guarantee from another operating authority (Section 506).

302.2 Intermittent operation of equipment -

- Requires a Test and Operate Permit (Section 502);
- Allows equipment to be safely operated or energized so that adjustments, repairs or maintenance tests can be performed;
- May require Worker-Administered Switching (Section 306.2);
- May require a Condition Guarantee from another operating authority (Section 506).

302.3 Control of re-energization -

- Requires a Hold-Off Permit (See section 503);

- Prevents automatic or manual restoration following an unplanned circuit outage, preventing further exposure of equipment and workers to electrical current;
- May require Worker-Administered Switching (Section 306.2);
- May require a Condition Guarantee from another operating authority (Section 506).

302.4 Work on auxiliary equipment that directly impacts the power system -

- Requires a Control System Permit (Section 504);
- Makes sure system security, customer supply and other permits are not compromised by work on equipment under 750 V (e.g., relays, protection circuits, voice and data communication systems, compressors, pumps etc.) that directly impacts or could impede operation of the power system.

302.5 Attach or Detach Facilities -

- Allows facilities (substations, lines, etc.) to be attached to or detached from the energized power system. (See section 600 - Attaching and Detaching Facilities);
- May require a Guarantee of Isolation Permit or a Hold-Off Permit (Sections 302.1, 302.3, 501 and 503);
- May require Worker-Administered Switching (Section 306.2);
- May require a Condition Guarantee from another operating authority (Section 506).

302.6 Enter a Substation or Generating Station (GS) -

- Requires notification to the appropriate OIC (Sections 303.1 and 303.2);
- Refers to substation or GS entry.

302.7 Vegetation Control -

- Requires notification to and approval of the appropriate OIC (Section 303.3);
- Some situations may also require a Guarantee of Isolation Permit or a Hold-off Permit (Sections 302.1, 302.3, 501 and 503);
- May require Worker-Administered Switching (Section 306.2);
- Refers to vegetation control in/near substations, near power lines and other power system facilities (e.g., mowing, tree trimming and danger tree removal).

302.8 Switching to establish a required condition between operating authorities or between OIC's within the same operating authority -

- Requires a Condition Guarantee (Section 506);

- Formal assurance of another operating authority or OIC that identified devices are in the position requested and will not change status until the Condition Guarantee is released;
- A Condition Guarantee is not a permit.

303 Notification and Permission Requirements

303.1 Substation Entry -

All persons entering a YEC substation must attend YEC Substation Awareness training (minimum requirement).

The worker must notify the OIC prior to entering and when departing a substation. The following information must be provided:

- The first and last name of the entrant;
- The substation name and/or number;
- The reason for entering;
- The system risk associated with the work; and,
- The expected duration (and, as applicable, the need for an extension).

This information allows the OIC to contact the worker if necessary (e.g., to gather information, to respond to an unplanned outage, etc.).

If an entry alarm is received from a remotely monitored substation without a confirming call, the OIC must:

- Call the substation;
- If no one answers, contact local workers to investigate; and
- Request police assistance, as required.

If the worker fails to report back after completing the work, the OIC must initiate an investigation.

303.2 Generating Station (GS) Entry -

YEC workers must notify the appropriate OIC or Plant Operator prior to entering and when departing a GS:

- At the start of the work day;
- At the end of the work day;
- When entry is after normal YEC working hours, including weekends;
- The worker is working alone⁴.

The following information must be provided to the OIC:

- The first and last name of the worker;
- The GS name and/or number;
- The reason for entering;
- The system risks associated with the work; and
- The expected duration (and, as applicable, the need for an extension).

This information allows the OIC or Plant Operator to contact the worker if necessary (e.g., to gather information, to respond to an unplanned outage, etc.).

If an entry alarm is received from a remotely monitored GS without a confirming call, the OIC must:

- Call the GS;
- If no one answers, contact local workers to investigate; and
- Request police assistance, as required.

If the worker fails to report back after completing the work, the OIC must initiate an investigation.

303.3 Vegetation Control -

The PIC must provide the appropriate OIC with the following information prior to starting the first day of work:

- A work schedule;
- Contact information; and
- A permit request, as applicable. See Section 803.

If the power system trips while the work is taking place, the OIC must attempt to contact the PIC.

⁴ Also see, YEC Safe Work Practice SWP-007; Travelling to Remote Location or Working Alone.

If no permits exist for the work, the OIC may attempt to re-energize the system.

The PIC must advise the OIC when the work schedule has been completed (and, as applicable, of the need for an extension).

Note - If day-to-day check-in is required due to the nature of the work (e.g., brushing in a remote area), formal check-in procedures should be used.

Also see, YEC Safe Work Practice SWP-007; Travelling to Remote Location or Working Alone.

303.4 Work On the Power System -

No work is allowed on/near the power system without the permission of the OIC.

The necessary permits must be requested in writing from the OIC, preferably at least **five (5)** working days in advance (see Section 803; Switching Information/Permit Request).

The OIC must review the request with the worker to identify any concerns;

The OIC must advise the worker as soon as possible whether the permit can be issued as requested;

Only the OIC can issue a permit.

304 [Permission to Establish Required Conditions](#)

After considering system security, customer supply and current permits, the OIC will schedule the work and provide permission to establish the required conditions through either OIC-administered switching or worker-administered switching.

304.1 OIC-Administered Switching -

Switching developed and directed by the OIC. Upon completion of the switching the OIC issues a permit (Hold-off, GOI, Test and Operate, and CSP) to the worker who has requested the operation or confirmation of devices in order to establish a safe work area. The permit establishes an agreement between the OIC and permit holder that the system is configured to provide the protection/notification requested.

305 [SLD & Switching Diagrams](#)

Before performing any switching, the switchman must have in his/her possession valid, approved SLD or switching diagrams that accurately detail the equipment contained within that system.

Copies of interim switching diagrams may be obtained through SCC or Drafting (Engineering Services), and authorized by the appropriate OIC.

306 Switching Orders

306.1 OIC-Administered Switching -

The OIC cannot direct any switching without a written switching order, except in the following situations:

- A switching order may not be required for voltage control work (e.g., adjusting regulator taps, capacitors or reactors);
- A switching order is not required in an emergency situation. See Section 902;
- During troubleshooting situations, the OIC must document each switching step prior to taking that action. However, all troubleshooting actions must be transferred to the switching order and a second approval received before a permit is issued.

The switch-person must obtain the switching order from the OIC before performing the switching, and verify the switching instructions with system switching diagrams and drawings.

If the written switching order is not available on site, the OIC will verbally provide the switching order step-by-step to the switchman. The switchman must:

- Record the switching steps exactly as stated; and
- Repeat the switching steps back to the OIC.

If multiple sites are involved, the OIC will verbally summarize the overall process and provide the switchman with only the step-by-step switching instructions pertinent to their site.

306.2 Worker-Administered Switching -

The worker performing the switching must:

- Review a switching order;
- If more than one Qualified Utility Worker is involved with the work, the switching order should be reviewed with another Qualified Utility Worker before proceeding – when practical; and
- Document the time of switching on the switching order.

If only one switching device is required, a “Do Not Operate” tag may be used as the switching order.

307 Voice Communications

Voice communication systems must be available for use between the permit holder and the OIC, and the switchman and the OIC.

Workers must not rely solely on telephone devices. When within range of Yukon Energy’s private radio system, it is preferred that the switchman have an operating two-way radio unit.

All transmission substations must have one or more voice communication systems available for use at all times. If there is any doubt as to the effect of a portable radio or cell phone on equipment in the building (e.g., a warning sign is posted), it must not be used.

Where continuous communication is not possible due to the site location, the OIC may allow scheduled communications. Consideration must be given to the following:

- Impacts to system security due to the communication delays; and
- Customer outages may be extended due to the communication delays.

SECTION 400 - ESTABLISHING REQUIRED CONDITIONS

401 Conducting a Power System Risk Assessment

401.1 General –

To minimize any hazardous situations or adverse effects on the power system, **the OIC** must conduct a thorough risk assessment:

- Before switching;
- During switching; and
- After switching.

The risk assessment must include a review of the following, as applicable:

- System voltages and line flows;
- Status of adjacent substations;
- Status of interconnected utilities, customers and loads;
- Equipment and system capabilities;
- Effect of the next worst contingency;
- Conflicting scheduled outages; and
- Current permits.

401.2 Distribution Tie Switches -

Before operating distribution switches that tie distribution feeders or transmission substations together, the OIC must consider the following:

- Possibility of inadvertently bypassing regulators;
- Settings and control of voltage regulators;
- Load shift;
- The state of the transmission system;
- System capabilities;
- Protection settings (e.g. ground trip block when bypass OCR); and
- Settings and switching of capacitors.

402 Switching

402.1 Communicating During Switching –

The OIC must communicate switching instructions directly with the switchman. The following exception is allowed:

- Switching instructions may be relayed through a third party when voice communication is not available. The third party must also be a Qualified Utility Worker.

All parties must use full name identification and location when relaying switching instructions.

Verbal communications must be:

- Repeated back by the receiving party as heard; and
- Verified against the switching order.

402.2 General Switching Procedures -

A discussion must occur between the OIC and the switchman **within 24 hours** before any switching to review the switching order and make sure that it is complete, correct, understood and all related hazards are identified.

Where provision has been made, preference will be to perform switching remote from the device. Remote operation refers to offsite control using SCADA or on site control using the HMI in the substation control building.

The switchman is required to check local devices and equipment and report any adverse conditions that could influence the switching to the OIC.

The step-by-step switching instructions must be followed in sequential order as provided on the switching order. If anyone identifies inconsistencies or concerns about the switching instructions at any time, the switching must be stopped and cannot proceed until their concerns are addressed.

The switchman must have the switching order in his/her possession when performing the switching and record the time each switching step or sequence, as applicable, is successfully completed.

The switchman must forward completed switching orders to OIC for retention (Section 807).

Whenever switching devices are being operated, the switchman must advise worker's onsite to stay clear.

Before operating any switch, the OIC must either check the device is rated for the operation or alternatively make sure that associated load break devices (e.g., circuit breakers) are opened first.

This check should include at least two of the following indicators:

- Power flow (MW and/or Mvar);
- Current flow or voltage on each individual phase;
- Operating position of supervisory control or local switchboard device; and/or

- Positions of the mechanical indicators on the associated load break devices.

If operating a non-load break switch locally, the switchman must check the open status of the associated load break device. E.g. breaker, OCR etc.

When supervisory controlled switching is being performed and a switchman is onsite, the switchman must verify the correct position following the operation of any disconnect switch.

Switches, grounding devices and other equipment that can be locked must be secured using a company system lock.

Also see, PSWS; Appendix B - Working on Overhead Power Systems

403 [Isolating Equipment](#)

All devices used as isolation points must be fully opened, confirmed to have an adequate visible air gap on all phases, tagged and locked before a permit is issued.

Approved Live Line Work Methods may be used to establish an isolation point (e.g., isolators or open jumpers).

When motor operated switches or circuit switchers are used as isolation points, the isolation procedure must include disabling the motor mechanism by:

- Placing the switch in 'LOCAL' control – where applicable;
- Locking the main drive or hand wheel in such a way that the main vertical operating shaft cannot turn; and
- De-coupling the motor from the operating shaft; and/or
- Removing the auxiliary power supply (AC and/or DC) to the motor.

When a normally open switch is used as an isolation point, the switch must be confirmed open onsite, locked and tagged.

When isolating a portion of the system where a PT or station service is permanently connected, the PT or station service must also be isolated using the secondary or primary disconnects unless confirmed to have no source of back feed.

When isolating indoor switch gear:

- The breaker must be removed from the cubicle or racked out to the disconnect position, locked and tagged to create the isolation point; or
- If the breaker is not removable, the associated solid blade disconnects or bus switches must be opened, locked and tagged to create the isolation point.

404 [Tagging](#)

Workers must understand and utilize the following tagging procedures:

To prevent unauthorized operation of devices, standard YEC 'Do Not Operate – Self Protection Tags' and/or SCADA tags (where available) must be installed as directed by the OIC. See Section 805 to determine the information required on each tag.

Only Qualified Utility Workers are permitted to install and/or remove tags.

Each active permit must have a corresponding tag at each location which is required to be tagged. (E.g. Five active GOI's would require five tags on each isolation point.)

Where a Condition Guarantee has been issued, the OIC who receives the Condition Guarantee may be permitted to install additional locks and tags on associated isolating devices.

An OIC who receives a Condition Guarantee can use the associated tags to form part of the first permit he may issue. If a Condition Guarantee is to be used for more than one permit the OIC issuing the permits must add additional tags to the associated isolating devices.

Where possible, electronic tag(s) must be installed on remote control equipment for each tag installed on devices in the field.

Only a Qualified Utility Worker may install or supervise the installation of tags for the OIC.

Tags must be installed on the same side as the switch identification number and as close as possible to the switching device (e.g., on the operating handles or, in the case of solid blade disconnects, on the associated structure, preferably at eye level).

Tags may be removed only at the direction of the OIC or, in the case of worker-administered switching, by the worker who installed the tags.

The OIC must be notified if:

- A tag discovered on any device or equipment appears unsupported by a permit; or
- An worker suspects a device has been operated unsupported by a tag or permit;
- The OIC will initiate an investigation and take appropriate action (e.g., direct removal of the tag, direct tagging and issue a permit or energize, as applicable). See Appendix C – Yukon Energy Permit Release Form.

405 Issuing and Holding Permits

For a detailed description of the restrictions and requirements for specific permits, see Section 500.

405.1 General Permit Requirements -

The permit is the worker's assurance that the power system conditions defined by the permit will not change until the permit is released. This assurance depends on strict adherence to the following requirements:

- In planned situations where switching is involved in establishing the required conditions, the permit holder must have in his/her possession a current copy of the switching diagram and the switching order prepared by the OIC before the permit is issued.
- If the written switching order is not available on site, the OIC will verbally provide the portion which contains the permit to the permit holder. The permit holder must:
 - Record the permit exactly as stated; and
 - Repeat the permit back to the OIC.
 - A discussion must be held between the permit holder and the OIC prior to:
 - Issuing a permit, to verify required power system conditions have been established through the switching order; and
 - Releasing a permit, to confirm established conditions can be returned to normal.
 - All parties must use full name identification and location; and repeat-back procedures whenever issuing, receiving or releasing permits.
 - All switching and tagging on the switching order required to provide the safe work area must be completed before the associated permit is issued.
 - All permits must be assigned a unique number using the switching order reference number with an alphabetical suffix (Section 804.3).
 - The PIC may accept a permit only for the work group(s) under their direction.
 - If the permit holder needs to leave the work location, he/she must either release the permit(s) or arrange to maintain established conditions with the permission of the OIC - e.g., by providing a means of contact while offsite or changing permit holders (Section 405.2).
 - Permits must be released when no longer required.
 - If permits are not released and the permit holder cannot be contacted, the OIC must contact the permit holder's immediate supervisor. The supervisor, if unable to locate the permit holder, must contact the Operating Authority for approval to release the permits.
 - Release for the permit must be documented (See Appendix C – YEC Permit Release Form)
 - During critical situations, permits must be released as soon as practicable at the request of the OIC.

405.2 Transfer of Permit Holders -

A permit can be transferred to another qualified utility worker or utility worker.

The permit holder will personally inform the OIC and others working under the permit of the proposed transfer.

The new permit holder must review and confirm the established conditions with the OIC.

The OIC will then:

- transfer/issue the permit to the new permit holder ;
- record the transfer on the switching order;
- request the original permit holder to release their permit;
- record other relevant information (i.e., tag updates).

The OIC will issue the new permit before releasing the original permit.

NOTES –

If a tag is used for Worker-Administered Switching, the new Qualified Utility Worker must place their tag on the device before the original tag is removed.

When tag(s) are installed over a considerable distance, the permit holder should make a reasonable attempt to have the tag(s) updated.

The OIC must be informed when tag(s) information is changed/updated.

405.3 Expanding or Contracting Safe Work Area Permit Conditions -

If a safe work area has to be expanded or contracted from an existing permit the OIC must:

- Direct installation of tags on the new devices which are required to be tagged to establish the new safe work area.
- If a new switching order is required, transfer the required existing tags and reference numbers defined in the previous switching order to the new switch order.
- Check that all devices have been identified and tagged to establish required conditions on the new permit.
- Issue the new permit to the permit holder.
- Direct removal of tags that are not required from the previous permit.
- Close the previous permit.

406 Return to Normal

When the work has been completed, the permit holder must inform the OIC and:

- In the case of OIC-administered switching, follow procedures to release the permit(s). See the following sections, as applicable:
 - 501.3: Releasing a Guarantee of Isolation Permit
 - 502.3: Releasing a Test and Operate Permit
 - 503.3: Releasing a Hold-Off Permit
 - 504.3: Releasing a Control System Permit; or
 - 505.3: Releasing the WAP permit.
- In the case of worker-administered switching, remove all tags and document the time.
- After all permits have been released, return to normal switching may proceed. See Section 402.

SECTION 500 - PERMITS

Also see Appendix D – Permit Flowchart

501 Guarantee of Isolation Permit

The Guarantee of Isolation Permit guarantees the permit holder that:

- A line or equipment has been isolated from all known power system sources of potential (and PT and station service disconnects, as applicable) and tagged on all boundaries of isolation; and
- The operating state of the isolating devices will not change until the permit is released.

501.1 Restrictions and Requirements –

1. A Guarantee of Isolation Permit may be held by any Qualified Utility Worker.
2. A Guarantee of Isolation Permit will not be issued using an isolation device that has an outstanding Test and Operate Permit issued on it.
3. Before a Guarantee of Isolation Permit is issued, tags must be securely placed on all isolating devices.
4. Devices located within the isolation points of a Guarantee of Isolation Permit and not tagged may be operated by the permit holder, with the understanding that, before the permit is released, the devices will be:
 - Returned to their original operating state; or
 - Placed in the operating state desired by the OIC, as applicable.
5. When applied potential is being used to test equipment (e.g., Doble testing, Hypot testing, primary injections) within a GOI zone of isolation, the permit holder must inform the OIC that such testing will be taking place. No additional GOI's are to be issued within the same zone of isolation while injection testing is in progress.
6. In the case of two or more work groups working under the same Guarantee of Isolation Permit, the permit holder must:
 - a. Provide each work group with permission to establish their own work protection (i.e., install grounds); and
 - b. Monitor work group activities to make sure all grounds are removed prior to releasing the permit.

501.2 Issuing a Guarantee of Isolation Permit -

When all conditions have been met, the OIC will issue the Guarantee of Isolation Permit (GOI) to the permit holder using the following words:

This is [OIC name] at SCC informing [PIC name] at [location] that [device or line] is now isolated between/opened at [location(s).] You may test for potential, install grounds as required, and proceed with your work under [GOI 16-###.]

501.3 Releasing a Guarantee of Isolation Permit

1. Before releasing the Guarantee of Isolation Permit, the permit holder must verify that:
 - Work has been completed;
 - All devices located within the isolation points of the permit are in their original operating state or the operating state desired by the OIC, as applicable;
 - Workers and equipment are clear;
 - Working grounds are removed; and
 - Equipment covered by the permit can be energized.

2. The Guarantee of Isolation Permit is released to the OIC with these words:

This is [PIC/permit holder name] at [location] informing [OIC name] at SCC, that I have completed my work on [device or line], all workers and equipment are in the clear, working grounds have been removed, and I am releasing [GOI 16-###.]

502 Test and Operate (T&O) Permit

The Test and Operate Permit provides assurance the OIC has assessed system security and adjustments, repairs or tests can be performed on **substation and/or line** equipment that may or may not be energized, as covered by the permit.

NOTE - A Test and Operate Permit is **NOT** intended as a form of personal protection – **NO GROUNDING** is allowed unless an overlapping Guarantee of Isolation is issued.

502.1 Restrictions and Requirements –

1. A T&O Permit may be held by a Qualified Utility Worker or a Utility Worker.
2. A T&O permit will not be issued for generation equipment.
3. Only one T&O Permit will be issued on single equipment at any time.
4. A T&O Permit will not be issued on any device defined as an isolation point for a Guarantee of Isolation Permit.
5. It is not permitted to install grounds under a T&O Permit.
6. A T&O Permit will not be issued on any device that is part of a Hold-Off Permit.
7. Before a T&O Permit is issued, tags must be securely placed on the switching devices that create the test condition.
8. If a device or equipment is required to be operated during tests, it may be operated only on instructions from the permit holder (e.g., opening/closing a circuit breaker).

502.2 Issuing a Test and Operate Permit -

After all requirements have been met, the OIC will issue the T&O Permit to the permit holder using these words:

This is [OIC name] at SCC informing [PIC name] at [location] that it is OK to test & operate [device] under test & operate permit [T&O 16-###.]

502.3 Releasing a Test and Operate Permit –

1. Before releasing a Test and Operate Permit, the permit holder must verify:
 - Work has been completed; and
 - Devices associated with the permit are in their original operating state or the operating state desired by the OIC, as applicable.
2. The Test and Operate Permit is released to the OIC using these words:

This is [PIC/permit holder name] at [location], informing [OIC name] at SCC, that I have completed my work on [device] at [location], all workers and equipment are in the clear, and I am releasing my Test and Operate Permit number [T&O 16-###].

503 Hold-Off (HO) Permit

A Hold-Off Permit prevents automatic or manual restoration following an unplanned circuit outage, preventing further exposure of equipment and workers to electrical current.

It confirms:

- Restoration and reclosing schemes are disabled;
- High-voltage sources of back feed (e.g., normally open tie switches, distribution-connected generators) will not continue to feed into a line fault; and
- Any device or line covered by the Hold Off Permit which has become de-energized will not be re-energized without the consent of the permit holder.

NOTE - A Hold-Off Permit is **NOT** intended as a form of personal protection – **UNDER NO CIRCUMSTANCES** will the Hold-Off be considered as isolation.

503.1 Restrictions and Requirements -

1. A Hold-Off Permit may be held by any Qualified Utility Worker, Utility Worker, or authorized Utility Tree Worker or Utility Tree Trimmer; or, other party as approved by the YEC Operating Authority.
2. Tags must be securely placed on all devices used to create the Hold-Off condition, including:
 - Switchboard control switches of circuit breakers associated with the electrical equipment covered by the Hold-Off;
 - Switchboard control switches or structures of any auto-sectionalizing, auto-transfer, or automatic reclosing schemes that could re-energize the equipment covered by the Hold-Off; and
 - Other control mechanisms not located within a control building.
3. If the Hold-Off condition is being established through supervisory control, field tags referenced in Section 503A.2. do not have to be installed however the OIC must apply software tags to all devices associated with the permit.
4. If the OIC receives an alarm indicating the associated protection may fail to operate under fault conditions (e.g., alarm for loss of DC), they must notify the permit holder. The permit holder and OIC must then determine if the Hold-Off can continue.
5. If the associated protection operates or a loss of potential is suspected, the permit holder must notify the OIC, or the OIC must notify the permit holder, as applicable.
6. The permit holder must notify the OIC if a contact or incident occurs.

503.2 Issuing a Hold-Off Permit -

After all requirements have been met, the OIC will issue the Hold-Off Permit to the permit holder using these words:

This is [OIC name] at SCC informing [PIC name] at [location] that reclosing has been disabled on [device or line] at [location(s)] and there is no back feed from [line number(s)] and switch number(s)] under Hold-Off Permit [HO 16-###].

503.3 Releasing a Hold-Off Permit -

1. Before releasing the permit, the permit holder must verify that:
 - Work has been completed; and
 - Devices associated with the permit are in their original operating state or the operating state desired by the OIC, as applicable (e.g., as required for attaching or detaching facilities).
2. The Hold-Off Permit is released to the OIC using these words:

This is [EIC/permit holder name] at [location] informing [OIC name] at SCC, that I have completed my work on [device or line], all workers and equipment are in the clear, and I am releasing my Hold-Off Permit [HO 16-###].

504 Control System Permit (CSP)

The Control System Permit allows the OIC to assess risks to system security, customer supply and other permits before work is performed on system equipment, including auxiliary and adjacent equipment, which directly impacts or could impede operation of the power system.

Examples are, but not limited to, the following:

- Protective relays and associated auxiliary devices;
- Voice and data communications;
- Instrument transformer secondary circuits;
- SCADA hardware and software;
- SCC facilities and auxiliary systems;
- Generation voltage regulation controls and power system stabilizers;
- Generator governor controls;
- Generating station auxiliary systems/controls;
- Substation auxiliary equipment and associated auxiliary devices.

If there is any doubt, contact the OIC.

NOTE - A Control System Permit is **NOT** intended as a form of personal protection – **UNDER NO CIRCUMSTANCES** will the CSP be considered as isolation.

504.1 Restrictions and Requirements -

1. A Control System Permit may be held by any Utility Worker.
2. A Control System Permit will not be issued for any equipment currently part of any other type of YEC work permit.
3. Before receiving a Control System Permit, the permit holder must describe to the OIC what they are doing and any local impacts if something goes wrong with the work.
4. If unexpected problems are encountered, the permit holder must report to the OIC before proceeding.
5. If conditions on the power system change and continuation of the work will jeopardize system security or customer supply, the OIC will determine if the release of the Control System Permit is required.

504.2 Issuing a Control System Permit -

The OIC will review the information provided by the permit holder, conduct a power system risk assessment (see Section 401), document any operational impacts and consider other existing permits before issuing a Control System Permit.

This is [OIC name] at SCC informing [PIC name] at [location] that it is ok to proceed with your work on [device/unit] under Control System Permit [CSP 16-###].

504.3 Releasing a Control System Permit -

Before releasing the permit, the permit holder must verify that the equipment associated with the permit is returned to its original operating state or the operating state desired by the OIC, as applicable.

This is [PIC/permit holder name) at [location] informing [OIC name] at SCC, that I have completed my work on [device/unit], all workers and equipment are in the clear, the device/unit has been returned to normal, and I am releasing [CSP 16-###].

Also see YEC SWP-025; Worker Administered Protection.

The WAP Permit allows the worker to determine what isolation points are required to safely perform work on power system equipment that directly impacts or could impede operation of the power system (e.g., generators, generator breakers, aux. generator equipment).

A WAP Permit holder can establish the isolation procedure(s) only after approval has been obtained from the OIC.

505.1 Restrictions and Requirements -

1. A WAP Permit may be held by any Utility Worker.
2. A WAP Permit will not be issued for any equipment currently part of any other type of YEC work permit.
3. A WAP Permit cannot be used as an isolation point for a GOI.
4. Before receiving a WAP Permit, the permit holder must describe to the OIC what they are doing and any local impacts if something goes wrong with the work.
5. If unexpected problems are encountered, the permit holder must report to the OIC before proceeding.
6. If conditions on the power system change and continuation of the work will jeopardize system security or customer supply, the OIC will determine if the release of the WAP Permit is required.

505.2 Issuing a WAP Permit -

The OIC will review the information provided by the permit holder, conduct a power system risk assessment (see Section 401), document any operational impacts and consider other existing permits before issuing a WAP Permit.

This is [OIC name] at SCC informing [PIC name] at [location] that it is ok to isolate [device/unit] under WAP Permit [WAP 16-###].

505.3 Releasing a WAP Permit -

Before releasing the permit, the permit holder must verify that the equipment associated with the permit is returned to its original operating state or the operating state desired by the OIC, as applicable.

This is [PIC/permit holder name] at [location] informing [OIC name] at SCC, that I have completed my work on [device/unit], all workers and equipment are in the clear, the device/unit has been returned to normal, and I am releasing [WAP 16-###].

506 Condition Guarantee⁵

A Condition Guarantee is generally used in communications between utilities or other external parties. It is the formal method of communicating that a switching or other particular operation within the external party's jurisdiction has been completed. The communication of the Condition Guarantee will include details of the actions that were taken, i.e. if an isolating switch was to be opened, checked open, locked and tagged, or a recloser had been blocked and the full name of the issuer and receiver.

When the GOI for the equipment being isolated is given out, the isolating devices operated by the external party would be included in the list of devices providing isolation of the equipment.

The request for the specified operation and the corresponding Condition Guarantee would proceed as follows:

This is [YEC OIC name] at SCC requesting [PIC/OIC at other utility] to [request action – open/close etc.] at [location].

The Operator in Charge in the other jurisdiction would then repeat the instruction back:

This is [PIC/OIC at other utility] to [YEC OIC name] at SCC – I understand that you are requesting [requested action – open/close etc.] at [location]. Is that correct?

Once the action has been completed the Operator in Charge for the neighboring jurisdiction would provide the Condition Guarantee that the action had been completed.

This is [PIC/OIC at other utility] advising [YEC OIC name] at SCC that [requested action complete and tag installed]

The Receiving Operator would then repeat back the Condition Guarantee received to confirm accuracy:

This is [YEC OIC name] at SCC to [PIC/OIC at other utility] - I understand that [requested action complete and tag installed]. Is that correct?

⁵ Source – YEC Authorization to Enter, Level 2 – High Voltage Switching Training (Section 7)

SECTION 600 - ATTACHING AND DETACHING FACILITIES

601 Procedure

When new construction is physically close to the point where it will eventually be tapped off the existing electrical system, a tag may be installed on the open span or jumpers to prevent inadvertent connection to the system. Jumpers and open spans used for isolation purposes shall be assigned a unique identifier. The tag can be installed as part of the OIC administered switching Condition Guarantee or alternatively installed as part of the Worker-Administered Switching.

When new construction is physically close to the existing electrical system and is only separated by a switch, a lock and/or tag must be installed on the open switch. The lock and/or tag can be installed as part of the OIC administered switching Condition Guarantee or alternatively installed as part of the Worker-Administered Switching.

To attach or detach facilities from the energized power system, the PIC must:

1. Provide the appropriate Operator(s)-in-Charge with suitable written documentation (e.g., final inspection, commissioning report stating "Approved to Energize") or de-commissioning report stating "Approved to De-Energize").
2. Provide the Operator(s)-in-Charge with an interim switching diagram, verified and approved by the PIC.
3. Identify the power system conditions required to complete the work, and request permission (Section 803; Switching Information/Permit Request) to establish those conditions from the Operator(s)-in-Charge.
4. Release the permits.

When a project requires energizing in stages:

The isolation points defining each stage must be identified in the project work plan and a copy of the work plan provided to the OIC.

Before each segment is energized, the OIC must be provided with interim switching diagrams verified and approved by the PIC.

SECTION 700 - OPERATING INTERFACE POINTS

701 Location of Operating Interface Points

To determine the location of operating interface points, refer to the table provided in Appendix A.

702 Joint Operating Procedures/Agreements

Wherever there is a direct interconnection to the power system, reference to switching practices must be included in a Joint Operating Procedure or Agreement.

The Joint Operating Procedure or Agreement provides information to aid in the development of switching orders (e.g., location of operating interface points, identity of the OIC, etc.).

703 Operator-in-Charge Interface Procedures

1. The OIC must give adjoining Operators-in-Charge prior notification of any action or condition that could impact their system.

This includes, as applicable:

- Changes to operating conditions;
- Operation of adjacent devices; and
- Any work being performed that could present a risk to their system.

2. When establishing conditions which require switching beyond an operating interface point, the OIC must:

- Exchange copies of corresponding switching orders with the adjoining OIC when coordinated switching is required with the other party; and
- Before completing the permitting process, receive a verbal Condition Guarantee from the adjoining OIC that required switching and tagging has been performed on their system and established conditions will not change until released by the OIC making the request.

SECTION 800 - PROCEDURAL TOOLS

801 Switching Diagrams

801.1 General -

Workers performing switching and/or receiving permits on the power system are required to use, for reference, approved and up-to-date switching diagrams. Switching diagrams include:

- All substation and line equipment, each identified by its unique number; and
- Operating interface points, as identified by the Operating Authority. See Appendix A.

801.2 Revisions -

1. Verified and approved interim switching diagrams (i.e., checked, dated and signed by the PIC) must be provided to the OIC and Engineering Services whenever modifications are made to the power system.
2. The OIC may accept verbal notification of a change to a switching diagram from an PIC if:
 - The change is minor and easily understood (e.g., a change to a switch number); and
 - The PIC will provide the OIC with a verified and approved interim switching diagram as soon as practicable.

The OIC has the discretion to deny the verbal notification and request a verified and approved interim switching diagram before accepting the change.

3. Interim and revised switching diagrams used to operate the power system must be authorized by the appropriate OIC.
4. The OIC must obtain approval from the affected Operating Authority to change an operating interface point.

802 Map Boards

The OIC must make sure the operating map board is accurate and current at all times.

803 Switching Information/Permit Request

The YEC Operating Authority uses System Switching Information forms for permit requests.

Switching information/permit requests must include:

- The line or equipment affected and the work location;
- The type of permit(s) requested;
- The dates and times the permit(s) are required and the anticipated duration of the work;
- The estimated time needed to release the permit in a critical situation;
- A description of the work;
- Required isolation points, as applicable;
- Any risks the permit holder is able to identify (i.e., local impacts if something goes wrong with the work);
- The means of communication to be used between the permit holder and the OIC, if other than radio or telephone; and
- The name of the permit holder.

804 Switching Order/Permit Form

804.1 General -

Using the information on the permit request, the OIC will conduct a power system risk assessment (see Section 401), schedule the work and prepare a switching order/permit form with the following information:

- A unique reference number;
- The dates and times the required power system conditions will be in effect;
- The switching sequence to be used to create those conditions;
- The switching sequence to be used to return to normal; and
- Permit issuance and release documentation.

NOTE - Where Worker-Administered Switching is involved, the “Do Not Operate” Tag may be the switching order. See Section 805.

804.2 Numbering Switching Steps -

1. The OIC must assign each switching step a unique number. That number cannot be repeated on the same switching order.
2. Switching step numbers must be sequential (i.e., in numerical order).
3. Switching steps may be added to an existing switching order by using alphabetical suffixes to preserve the existing sequence (e.g., 36A, 36B, 36C, etc.).

804.3 Numbering Permits -

The OIC must assign each permit a unique number using the following format:

PERMIT TYPE - YEAR (LAST 2 DIGITS ONLY) – NEXT SEQUENTIAL NUMBER

Examples –

- CSP 12-001 (permit type is CSP; year is 2012; 001 is first permit issued in 2012);
- GOI 12-002 (permit type is GOI; year is 2012; 002 is the next permit issued in 2012);
- WAP 12-002 (permit type is WAP; year is 2012; 002 is the next permit issued in 2012).

805 Do Not Operate –Self Protection Tags

All tags placed on power system devices and equipment should be associated with a specific permit.

Only standard Yukon Energy “**Do Not Operate – Self Protection**” tags or SCADA tags may be used.

Do not use plastic coated, reusable type tags.

The following information must be legibly recorded on the tag:

- Permit number;
- Tag number (e.g. 1 of 5);
- Switch or equipment number;
- Reason for isolation;
- Workers’ name (use ‘Ordered Open By’ field);
- Date and time.

Also see:

- Yukon Energy SWP-013; Lock Out – Self Protection Tag
- Alberta Electrical Utility Code; 4-084; Tagging

806 Transfer of Authority

1. The OIC must transfer operating authority whenever they cannot:
 - Maintain scheduled communication with permit holders; and/or
 - Provide the dedicated time and attention required to monitor and operate their portion of the power system effectively.
2. Transfers of authority for each OIC shall be recorded. All scheduled transfers are recorded on the SCC shift schedule. The outgoing OIC must record and communicate to the new OIC

any outstanding permits or known work being done and abnormal system conditions at the time of the transfer.

3. Workers should know who the OIC is at all times.
4. All transfers of authority on the distribution system must be communicated to all permit holders.

807 Record Keeping

807.1 The OIC must maintain the following records for a minimum of three years:

- a. Transfers of authority;
- b. All switching orders used to issue permits, including tags used as switching orders;
- c. Documentation of any investigations regarding tagging or unauthorized operation of power system devices or equipment; and
- d. Log books documenting:
 - i. All permit information including reference numbers; and
 - ii. All Condition Guarantee information; and
 - iii. Operator-Administered switching; and
 - iv. Worker-Administered switching; and
 - v. Unscheduled transfers of authority.

807.2 Workers must forward completed switching orders to OIC for retention.

808 Third Party Release of Permit

808.1 Release of a permit by anyone other than the original permit holder may only be performed under the direction of a YEC Leadhand, Supervisor, Manager, or Director, who is subject to certain limitations, with no exceptions.

808.2 The 3rd party permit release process shall be documented the process as per Appendix C – Yukon Energy Permit Release Form.

808.3 The '3rd party' shall *FIRST* exhaust all avenues of contacting the 'permit holder' for permission before initiating a 3rd party permit release.

Note - Every reasonable effort must be made to contact worker to have them remove the lock/tag.

808.4 If the '3rd party' is able to contact the permit holder, they shall:

- a. Ask the worker to contact SCC OIC and release the permit; or;
- b. Receive permission from the permit holder to release the permit.

808.5 If the Supervisor/Leadhand, or designate is unable to contact the permit holder, the department Director (or designate) must be notified prior to releasing the permit.

808.6 Prior to initiating the 3rd party permit release, the Supervisor/Leadhand, or designate shall:

- a. Verify that all locks and tags have been removed from the affected equipment;
- b. Verify that the affected equipment is fully operational; and
- c. Ensure that no worker is impacted by the release of the permit.

808.7 On verification of *all personnel being clear* of the affected equipment, the Supervisor/Leadhand, or designate shall release the permit.

808.8 All YEC workers required to use PSWS shall be trained in the YEC 3rd Party Release of Permit procedure.

SECTION 900 - SPECIAL SITUATIONS

901 Outages and Trouble Calls

During regular hours, permission must be obtained from the OIC before making any attempt to restore power.

After-hours, if the trouble call involves a distribution radial-fed line and the risk to the power system is minimal, the worker may proceed as follows:

1. If practical, patrol to identify the cause (e.g., temporary fault due to contact by a bird, lightning or a tree).
 - If the problem is found and the PIC can repair it, Worker-Administered Switching (as per section 304 B) may be used with prior approval of the OIC, to repair the damage and restore power.
2. One attempt to re-energize may be made by re-fusing or reclosing the OCR, as applicable.
 - If successful, notify the OIC as soon as it is practical.
 - If unsuccessful, follow all applicable standards for establishing required power system conditions, as provided in this document.

These standards apply 24 hours a day.

902 Emergency Situations

In an emergency, (a present or imminent event that requires prompt coordination of action to protect the health, safety or welfare of people or to limit damage to property and/or the environment), an worker may take action to remove equipment from service without prior authorization.

- **Always protect yourself.**
- **NEVER put yourself in imminent danger or do anything of which you are in doubt – call for help.**

After emergency action has been taken, the operation and the reason for the action must be reported to the appropriate OIC as soon as possible.

The OIC will review the action and take the necessary steps to restore the power system.

903 Inadvertent Operation of Equipment

If a worker inadvertently operates any component of the power system, the worker must NOT attempt to correct the error, but immediately notify the OIC.

The OIC will review the inadvertent operation and take the necessary steps to restore the power system, as applicable.

Appendix A – Operating Interface Points

	Transmission	Distribution	Generation	Customer	Other Utility
Transmission	Not Applicable.	Any distribution system facilities downstream from the equipment shown on the substation switching diagram.	As agreed to by the Operating Authorities and clearly defined on substation switching diagrams. Where there is a direct interconnection, a Joint Operating Procedure must be established (see Section 700).	As agreed to by the Operating Authorities and clearly defined on associated customer and company switching diagrams. Where there is a direct interconnection, a Joint Operating Procedure must be established (see Section 700).	As agreed to by the Operating Authorities and clearly defined on associated utility, company and transmission switching diagrams. Where there is a direct interconnection, a Joint Operating Procedure must be established (see Section 700).
Distribution	Any distribution system facilities downstream from the equipment shown on the substation switching diagram.	As agreed to by the Operating Authorities or Operators-in-Charge and clearly defined on company distribution switching diagrams.	Located on the distribution system equipment electrically closest to the unit breaker, unit transformer or station auxiliary transformer.	As agreed to by the Operating Authorities and clearly defined on associated customer and company switching diagrams and/or distribution switching maps. Where there is a direct interconnection, a Joint Operating Procedure must be established (see Section 700).	As agreed to by the Operating Authorities and clearly defined on associated utility, company and distribution switching diagrams.

	Transmission	Distribution	Generation	Customer	Other Utility
Generation	As agreed to by the Operating Authorities and clearly defined on substation switching diagrams. Where there is a direct interconnection, a Joint Operating Procedure must be established (see Section 700).	Located on the distribution system equipment electrically closest to the unit breaker, unit transformer or station auxiliary transformer.	N/A	N/A	N/A

Appendix B - Working on Overhead Power Systems

1.0 Switching Overhead Power Lines

1.1 Standards:

1. Only a qualified utility worker, or a utility worker under the direct supervision of a qualified utility worker, may perform switching on overhead power lines.
2. All switching operations must be performed in compliance with the Power System Work Standards (PSWS).
3. Where provision has been made, preference will be to perform switching remote from the device. Remote does not necessarily mean from System Control Centre, it can include the substation building
4. Non load break devices may be operated when the device:
 - A visual check (breaker status indication, meter indication, etc.) confirms the electrical load has been removed or appropriately transferred to safely open the device; or
 - If operating the switch locally, the associated breakers must be visually confirmed in the open state at the device; or
 - A potential check has confirmed that the device is isolated; or
 - A load break tool is used.
5. Workers operating gang switch handles must wear Class 3 (30 kV) rubber gloves.

1.2 Applying the standards:

For the load break capabilities of distribution devices, refer to the Distribution Construction Standards Manual. For transmission devices, refer to SO-217: Operating Guidelines for Transmission Line Air Break Disconnect Switches.

1.3 Switching Regulators In and Out of Service

1. All regulator switching bus be completed using Operator in Charge administered switching.
2. Before switching distribution regulators, there must be two indications that the regulator is in the neutral position.
3. If regulators are operating in parallel, the paralleling control must be disabled.
4. The regulator control must be turned off before being placed in service or removed from service.
5. On distribution power lines, the motor circuit must be disabled by removing the motor circuit fuses or turning off the motor circuit breaker.

1.4 Switching Autoboosters In and Out of Service

1. All auto booster switching must be completed using Operator in Charge administered switching.
2. Before switching an auto booster, there must be at least one visual indication that the auto booster is in neutral.

1.5 Switching Capacitor Banks In and Out of Service

1. All capacitor switching must be completed using Operator in Charge administered switching.
2. Workers performing capacitor switching must wear Class 3 (30kV) rubber gloves.
3. Workers checking capacitor control voltage and bandwidth settings must wear Class 0 (1000V) or greater rubber gloves.
4. Before switching a capacitor on or off, a visual check must be done to make sure that all oil switches are either open or closed.
5. After a capacitor has been isolated, workers must wait five minutes to install grounds.

NOTE - Refer to the Power System Work Standards for safe switching practices.

2.0 Measuring Energized Conductor Heights

2.1 Standards

1. Only a qualified utility worker or a utility worker under the direct supervision of a qualified utility worker may measure live conductor heights with live line measuring sticks.
2. A rated live line measuring tool must be used when there is contact between a conductor or equipment energized at over 300 volts and ground.

2.2 Applying the standards

Follow the same procedures for maintaining, inspecting and testing measuring tools as for hot sticks and other live line tools (see Section 305).

Workers must wear HV rubber insulating gloves when measuring conductor height.

Always protect yourself from traffic hazards when measuring road clearances (see Section 601).

3.0 Lifting Energized Conductors

1. Before lifting energized conductors with a live line tool or an auxiliary arm, the worker must:
 - Check the condition of the poles, top ties and sleeves;
 - Check for sleeves in the line;
 - Consider tension changes; and
 - Plan for the consequences of failure.
2. Telescopic sticks or other hand held tools must NOT be used to lift energized or ungrounded conductors.

3. When lifting grounded conductors, the telescopic stick must be under the direct control of the worker doing the lifting.
4. The conductor must not be lifted higher than two times the sag.
5. Workers must wear HV rubber insulating gloves when lifting energized conductors.

4.0 Performing Construction and Maintenance Work on Energized Overhead Power Systems

4.1 Standards

4.1.1 Working on Energized Overhead Systems Above 750 Volts

1. Only a qualified utility worker or a utility worker under the direct supervision of a qualified utility worker may work on overhead voltages above 750 volts
2. All live line work requires at least two qualified utility workers, when practical.
3. Workers working on lines energized from 750 volts up to and including 25kV must wear Class 3 rubber gloves (30kV).
4. Communication technologists working on station communication services which could become energized up to 5 kV must wear Class 1 (10kV) rubber gloves.
5. Only appropriately tested and rated cover up and tools may be used. (See Appendix A – Equipment Test & Service Schedule)
6. Only an electrically tested and insulated aerial device or an electrically tested and insulated platform may be used for rubber glove work on voltages over 5 kV.
7. Whenever there is a possibility that personnel, tools or equipment could contact an energized line, the automatic or manual restoration of the circuit could prove hazardous and control of automatic restoration is available, a Hold Off permit must be put in place. Note: A Hold Off Permit is NOT intended as a form of personal protection – under no circumstances is the Hold Off to be considered as isolation.

4.1.2 Working on Energized Overhead Systems Less Than 750 Volts

1. Workers working on overhead lines energized between 300 and 750 volts must wear appropriately rated rubber gloves.
2. Workers working on overhead lines energized at less than 300 volts (e.g., 120/240 volt secondaries) must conduct a hazard assessment to make sure adequate barriers are in place to address second points of contact, congested work areas, weather conditions, etc.

4.1.3 Applying the standards:

When working on overhead lines 300 volts or less, it is recommended that workers carry their Class 0 rubber gloves (1000 V) and have them available for immediate use.

5.0 Working Near Energized Overhead Power Systems Above 750 Volts

5.1 Standards:

1. Workers may not approach any exposed electrical equipment or lines, or allow objects or equipment within their specified limits of approach. Refer to Tables 5-1 and 5-2.

See AEUC rule 4-136; page 53 and AEUC Table 4-2; page 60.

See AEUC rule 4-140; page 53 and AEUC Table 4-3; page 61.

2. A qualified utility worker performing live line work using rubber gloves from a pole or structure on electrical equipment or lines operating at voltages below 5 kV between conductors must:

- Maintain a limit of approach distance of 150 mm between unprotected body parts and the exposed energized phase being worked on; and
- Maintain a limit of approach distance of 500 mm between unprotected body parts and exposed adjacent phases or exposed grounded parts.

EXCEPTION - This does not apply if rated insulated devices have been placed on the exposed energized parts, exposed structure or exposed grounded parts.

2. Any aerial device or radial boom digger required to work near energized lines or equipment must be grounded or barricaded.
3. Whenever there is a possibility that personnel, tools or equipment may contact an energized line, the automatic or manual restoration of service could prove hazardous and control of automatic restoration is available, a Hold Off must be put in place.

6.0 Grounding

6.1 Standards

1. All conductors and equipment are to be considered energized until they are tested for potential using an approved potential indicator and grounded.
2. A self test must be conducted on the potential indicator prior to use.
3. In wet conditions (i.e. rain, sleet, wet snow), the voltage scale on the potential indicator must be continuously lowered until a reading is detected.
4. Equipotential bonding and grounding practices must be used when a worker is required to work on an isolated line.

7.0 Tension Stringing Overhead Conductors

7.1 Standards

1. Only a trained worker may operate tensioning equipment.

2. Pulling and tensioning equipment must be grounded and parked on a ground gradient mat when it is operated near energized conductors.
3. Travellers must be bonded together at the structure closest to the puller.
4. Travelling grounds must be installed at the tensioning equipment.

8.0 Isolating Transformers for Non Payment

8.1 Standards

1. When isolating the transformer, open the fused disconnect switch. A self protection tag is not required on the switch.
2. When the transformer is isolated using a hot tap only, the hot tap must be removed and securely attached to itself. A self protection tag is not required on the pole.
3. Before energization, the area must be visually inspected for obvious hazards and permission obtained from the Operator in Charge.



YUKON ENERGY PERMIT RELEASE FORM

Date: _____ Permit #: _____

Equipment: _____

Lock location: _____

Permit Holder: _____



Every reasonable effort must be made to contact the permit holder and have them remove the lock/tag.

Confirm permit holder has left site. _____ Time: _____

If permit holder is off site:

Home? Yes No Time: _____

Other YEC site? Yes No Time: _____

If yes, where?

Vacation/Leave Yes No Time: _____

Other (describe below) Yes No Time: _____

Was contact made with the permit holder? Yes No Time: _____

IF NO - Notify departmental Director (or designate) to inform permit release. THIS IS MANDATORY.



Work area must be clear of workers and equipment. Equipment must be ready for service.

Work area verified by: _____ Time: _____

Comments: _____

Is it safe to release the permit Yes No

Permit released by: _____ Time: _____

Witnessed by: _____ Time: _____

Authorizing signatures (Print Name and Initial)

Permit holders Supv. _____ Date: _____ Time: _____

Operating Authority (or designate) _____ Date: _____ Time: _____

H&S Dept. _____ Date: _____ Time: _____

Return completed form to H&S Department within 48 hours of permit release.

Appendix D – Permit Flowchart

