# Explain Commonly Used Safe Work Permits

## TABLE OF CONTENTS

<table>
<thead>
<tr>
<th>Section</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>PREREQUISITES</td>
<td>3</td>
</tr>
<tr>
<td>STUDENT RESOURCES</td>
<td>4</td>
</tr>
<tr>
<td>FUNDAMENTALS OF SAFE WORK PERMITS</td>
<td>5</td>
</tr>
<tr>
<td>COMMONLY USED SAFE WORK PERMITS</td>
<td>8</td>
</tr>
<tr>
<td>SELF PROTECTION PERMIT</td>
<td>10</td>
</tr>
<tr>
<td>ISOLATION PERMIT</td>
<td>12</td>
</tr>
<tr>
<td>WORK PERMIT</td>
<td>13</td>
</tr>
<tr>
<td>WORK &amp; TEST PERMIT</td>
<td>15</td>
</tr>
<tr>
<td>SUMMARY</td>
<td>17</td>
</tr>
<tr>
<td>PRACTICE FEEDBACK</td>
<td>17</td>
</tr>
<tr>
<td>EVALUATION</td>
<td>17</td>
</tr>
</tbody>
</table>
**Notes:**

**PREREQUISITES**

- Level 1 Apprenticeship Training
- Level 2 Apprenticeship: "Alternating Current" modules
- Level 2 Apprenticeship module: "Describe the Standard Protection Code and Explain Why it is Required"
- Level 2 Apprenticeship module: "Explain the Five States of Apparatus"

**Objectives:** Upon completion of this module, you will be able to explain the protection provided by Self Protection Permits, Isolation Permits, Work Permits and Work & Test Permits.

<table>
<thead>
<tr>
<th>LEARNING OBJECTIVES</th>
<th>LEARNING METHODS</th>
<th>EVALUATION METHODS</th>
</tr>
</thead>
<tbody>
<tr>
<td>After completing this lesson, the learner will have a greater understanding of the fundamentals of safe work permits.</td>
<td>Self Learning</td>
<td>Final Test</td>
</tr>
<tr>
<td>After completing this lesson, the learner will have a greater understanding of commonly used safe work permits.</td>
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STUDENT RESOURCES

- SaskPower Standard Protection Code Book
Lesson 1: Fundamentals of Safe Work Permits

**Learning Objective:** After completing this lesson, the learner will have a greater understanding of the fundamentals of safe work permits.

**Learning Method:** Self Learning

**Evaluation Method:** Final Test

**INTRODUCTION**

Whereas a Stand-Off provides no personnel protection (it is a System Security Permit), safe work permits provide a guarantee that specified apparatus has been taken to a certain state. Different permits provide different guarantees of the state of the apparatus.

The permit zone is defined by the "points of protection". If a permit is providing a guarantee of isolation, it is the isolating devices (e.g. riser, gopt switch, line and load by-pass blades), that define the permit zone. If a permit is providing a guarantee of de-energization, it is the de-energizing devices (system/trip grounds) that define the permit zone. These points of protection do not necessarily make the apparatus an electrically safe zone. They will protect against dynamic energy, but charged energy hazards have to be controlled with approved bonding and grounding procedures (working grounds) before the zone is electrically safe.

All points of protection of a permit must be tagged. That includes all isolating devices and de-energizing devices (system/trip grounds).
Figure 1. Example of Permit Zone and Work Area
Applications for permits have to be made to the appropriate Issuing Authority. For distribution non-remotely controlled lines, application is made to the Issuing Authority in the district where the work is to be performed. The permit will follow the procedure as outlined in Rule 5, (with some variations depending on which permit is being used) until the specified work has been completed, the permit has been surrendered, the apparatus has been restored to service and cards have been removed.
Lesson 2: Commonly Used Safe Work Permits

Learning Objective: After completing this lesson, the learner will have a greater understanding of commonly used safe work permits.

Learning Method: Self Learning

Evaluation Method: Final Test

INTRODUCTION

There are four permits commonly used on SaskPower’s Transmission and Distribution apparatus. They are:

- Self Protection Permit – a guarantee of isolation provided by the Permit Holder
- Isolation Permit – a guarantee of isolation provided by the Issuing Authority
- Work Permit – a guarantee of de-energization provided by the Issuing Authority
- Work & Test Permit – a guarantee of de-energization (at the time of issuance) provided by the Issuing Authority

Each permit has unique applications and characteristics. The table below explains applications of each permit and the state of apparatus at issuance and surrender.

<table>
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</tr>
<tr>
<td>Work &amp; Test</td>
<td>T&amp;D Electrical Apparatus</td>
<td>De-energized System/Trip Grounds</td>
<td>Any state that was agreed upon by the issuing authority and the permit holder prior to issuance</td>
</tr>
</tbody>
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Figure 3. Application of Permits and State of Apparatus

For all safe work permits:

- Installation and removal of system/trip grounds are directed by the Issuing Authority and must be tagged
- On Distribution apparatus if the isolating devices and de-energizing devices (system/trip grounds) are at the same location (e.g. padmount transformer), only one card is required
Notes:

- Installation and removal of working grounds are directed and documented by the Permit Holder and cards are not required.
- Working grounds must always be removed before the surrender of any safe work permit.
- Cards are not required if staying at the isolating device.
**Lesson 3: Self Protection Permit**

**Learning Objective:** After completing this lesson, the learner will have a greater understanding of Self Protection Permits.

**Learning Method:** Self Learning

**Evaluation Method:** Final Test

**Self Protection Permit**

A Self Protection Permit is a guarantee of isolation that can only be used on non-remotely controlled radial Distribution apparatus. Radial means there is only one source of dynamic energy.

A Self Protection Permit is used for work such as:

- Pole, insulator or crossarm change
- Transformer change

The process of a Self Protection Permit is slightly different than other safe work permits. Normally the guarantees of a permit are provided by the Issuing Authority. But in this case, the Issuing Authority issues a **permit number only** to an authorized Permit Holder. That permit number is tied to a specific isolating device. The Permit Holder has control of that isolating device until the specified work has been completed and the permit has been surrendered. An isolating device used for a Self Protection Permit cannot be used for any other permit while the Self Protection Permit is in effect.

The Permit number can be issued to a qualified Power Line Technician well in advance of the actual work taking place. For instance, it could be issued at 08:00 hrs. for work that is planned for 13:00 hrs. Approximate time of the work commencing must be agreed to by the Issuing Authority and the Permit Holder in advance. That permit number is tied to a specific isolating device. Upon issuance of that permit number, the Permit Holder has control of the isolating device that feeds the specified apparatus to be worked on. Until the permit is surrendered, no other permit can be issued using that same isolating device.

As it is only used on a radial, a Self Protection Permit has only one point of protection (isolating device), and it **must be tagged** with a Distribution Permit Card. However, if the Switch Person is going to remain at the location of the isolating device during the entire
duration of the work, a card is not required. The Permit Holder is responsible to ensure that the Switch Person is qualified.

A Self Protection Permit is a guarantee of isolation, not de-energization, so system/trip grounds are not required.

The Self Protection Permit does not guarantee an electrically safe zone as there may be charged energy hazards; therefore, the Permit Holder must:

- use working grounds and document their installation on the Hazard and Risk Assessment, or
- work using live line work procedures.

The Permit Holder directs and logs the removal from service switching, the installation of working grounds (if applicable), the completion of the work and the return to service switching. Then the permit must be surrendered as soon as practical after the return switching has been completed.
Lesson 4: Isolation Permit

Learning Objective: After completing this lesson, the learner will have a greater understanding of Isolation Permits.

Learning Method: Self Learning

Evaluation Method: Final Test

INTRODUCTION

An Isolation Permit is a guarantee of isolation that can only be used on Transmission and Distribution electrical apparatus. It can be used on both remotely and non-remotely controlled apparatus. An Isolation Permit is a guarantee of isolation, not de-energization, so system/trip grounds are not required.

The apparatus is in the isolated state when the permit is issued and when it is surrendered.

An Isolation Permit is used where there is more than one source of dynamic energy for work such as:

- Pole, insulator or crossarm change
- Transformer change (e.g. padmount transformer in a RUD loop)
- Primary underground cable repair

The Issuing Authority is required to:

- Prepare a Switching Plan for removal and return to service
- Forward it to the Permit Holder and Switch Person(s) for checking and approval
- Direct the Switching Plan

The Isolation Permit does not guarantee an electrically safe zone as there may be charged energy hazards; therefore, the Permit Holder must:

- use working grounds and document their installation on the Hazard and Risk Assessment, or
- work using live line work procedures.

The isolating devices must be tagged with a Distribution Permit Card unless the Switch Person is going to stay at the location of the device.
Lesson 5: Work Permit

Learning Objective: After completing this lesson, the learner will have a greater understanding of Work Permits.

Learning Method: Self Learning

Evaluation Method: Final Test

INTRODUCTION

A Work Permit is a guarantee of de-energization that can be used on Transmission and Distribution electrical apparatus. It can be used on both remotely and non-remotely controlled apparatus. Because a Work Permit is a guarantee of de-energization, system/trip grounds are required.

A Work Permit is used where there is more than one source of dynamic energy for work such as:

- Pole, insulator or crossarm change
- Transformer change (e.g. padmount transformer in a RUD loop)
- Primary underground cable repair

The apparatus is in the de-energized state when the permit is issued and when it is surrendered. The Issuing Authority is required to:

- Prepare a Switching Plan for removal and return to service
- Forward it to the Permit Holder and Switch Person(s) for checking and approval
- Direct the Switching Plan

The Work Permit may not guarantee an electrically safe zone as there may be charged energy hazards, therefore, the Permit Holder must:

- determine whether the system/trip grounds provide an electrically safe zone and therefore can be used as working grounds, or
- use working grounds and document their installation on the Hazard and Risk Assessment, or
- work using live line work procedures.

The isolating and de-energizing devices must be tagged unless the Switch Person is going to stay at the location of the device.
On Distribution apparatus when the isolating and de-energizing devices are at the same location, one Distribution Permit Card may be used with the approval of the Issuing Authority.
Lesson 6: Work & Test Permit

**Learning Objective:** After completing this lesson, the learner will have a greater understanding of Work & Test Permits.

**Learning Method:** Self Learning

**Evaluation Method:** Final Test

**INTRODUCTION**

A Work & Test Permit is a guarantee of de-energization (at the time of issuance) that can be used on Transmission and Distribution electrical apparatus. It can be used on both remotely and non-remotely controlled apparatus. Because a Work & Test Permit is a guarantee of de-energization, system/trip grounds are required to be in place at the time of issuance.

A Work & Test Permit is often used for fault locating or "thumping" primary underground cable. While the permit is in effect, the Work & Test permit allows the removal of the system/trip grounds and the apparatus to be made alive for testing purposes.

The apparatus is in the de-energized state when the permit is issued and can be in any state when it is surrendered. The Issuing Authority and Permit Holder must have prior agreement as to the state the apparatus is to be in when it is surrendered.

In the case of a primary underground cable fault, this enables the Permit Holder to remove the system/trip grounds and make the cable alive from the system after the fault has been repaired - but before surrendering the permit - to make sure there are no more faults on that section of cable (which can happen with mole damage). Any additional fault could be located (thumped) and repaired under the same Work & Test Permit. If the permit had been surrendered, there would have to be an entirely new permit and Switching Plan prepared to find and repair the additional fault(s).

The Issuing Authority is required to:

- Prepare a Switching Plan for removal and return to service
  - Any devices that require a change of state must be clearly identified on the plan
- Forward it to the Permit Holder and Switch Person(s) for checking and approval
- Direct the Switching Plan

The Work & Test Permit may not guarantee an electrically safe zone as there may be charged energy hazards. Therefore, the Permit Holder must:

- Determine whether the system/trip grounds provide an electrically safe zone and therefore can be used as working grounds, or
- Use working grounds and document their installation on the Hazard and Risk Assessment, or
Notes:

- Work using live line work procedures

The Permit Holder is also responsible to prepare a written procedure to make sure the testing is safe and the system secure.

The isolating and de-energizing devices must be tagged unless the Switch Person is going to stay at the location of the device.

![Work and Test Permit card and tag](image)

*Figure 6. Work and Test Permit card and tag*

On Distribution apparatus when the isolating and de-energizing devices are at the same location, one Distribution Permit Card may be used with the approval of the Issuing Authority.
SUMMARY

The learner shall now have a better understanding of commonly used safe work permits.

PRACTICE FEEDBACK

Review the lesson, ask questions and complete the self-test.

EVALUATION

Final Test. You are required to achieve 100%.
Notes:

**REVIEW QUESTIONS**

T / F  1. The permit zone is defined by the points of protection.

T / F  2. The points of protection for a permit providing a guarantee of de-energization are:
   (a) the isolating devices
   (b) the working grounds
   (c) the system/trip grounds
   (d) all of these

T / F  3. An Isolation Permit is issued and surrendered when the specified apparatus is in the de-energized state.

T / F  4. A Work & Test Permit can be surrendered in any state agreed upon by the Issuing Authority and the Permit Holder prior to issuance.

T / F  5. If the permit is to be surrendered in the de-energized state:
   (a) Both working grounds and system/trip grounds must be removed
   (b) Working grounds are removed and system/trip grounds remain on
   (c) System/trip grounds are removed and working grounds remain on
   (d) Both working grounds and system/trip grounds must remain on

T / F  6. Working grounds are always removed before surrender of any safe work permit.

T / F  7. A Self Protection Permit can only be used on non-remotely controlled radial apparatus.

T / F  8. The Issuing Authority prepares and directs the Switching Plan for the Isolation, Work and Work & Test Permits.

T / F  9. The Switching Plan must be checked and approved by:
   (a) the Permit Holder
   (b) the Switch Person
   (c) every person working under the Permit
   (d) both a and b

T / F  10. System/trip grounds are required by an Isolation Permit.

T / F  11. The Issuing Authority prepares and directs the Switching Plan for the Isolation, Work and Work & Test Permits.

T / F  12. The Switching Plan must be checked and approved by:
   (a) the Permit Holder
Notes:

(b) the Switchperson
(c) every person working under the Permit
(d) both a and b

T / F 13. A Work Permit is issued and surrendered in the de-energized state.

T / F 14. The Issuing Authority prepares and directs the switching plan for the Isolation, Work and Work & Test Permits.

15. The Switching Plan must be checked and approved by:
   (a) the Permit Holder
   (b) the Switchperson
   (c) every person working under the Permit
   (d) both a and b

16. The permit that can be surrendered in any state agreed to by the Issuing Authority and the Permit Holder is the:
   (a) Self Protection Permit
   (b) Work & Test Permit
   (c) Work Permit
   (d) Isolation Permit
REVIEW QUESTION SOLUTIONS

1. T
2. the system/trip grounds
3. F
4. T
5. Working grounds are removed and system/trip grounds remain on
6. T
7. T
8. T
9. both a and b
10. F
11. T
12. both a and b
13. T
14. T
15. both a and b
16. Work & Test Permit
APPENDIX

Figure 1. Example of Permit Zone and Work Area
Work site is actual location where work is being performed. Permit zone is the area inside the point of protection (Non-Reclose at OCR).

Figure 2. Work Site and Permit Zone
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Figure 3. Application of Permits and State of Apparatus
Figure 4. Self Protection Permit card
Figure 5. Work Permit card and tag
Figure 6. Work and Test Permit card and tag