July 2016

# Safety Handbook

Name:

NORTHWEST TERRITORIES POWER CORPORATION

***Safety**: A set of standards and processes for lowering risk to a level that is acceptable to both employees and management.*

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***Safety Culture**: The attitudes, beliefs, perceptions, values, and behaviours that employees share in relation to safety.*

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## How to Use this Book

All workers are responsible to understand and abide by the Health & Safety Management System (HSMS). This includes all elements, Safe Work Practices, and Safe Job Procedures.

This book does not contain the full HSMS and is only to be used as a quick reference. Some information may not be current. Always refer to the PowerLine for the most current and complete documents of the HSMS.

## Important Phone Numbers

Fire:

Medical:

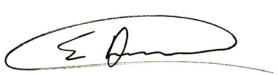
Police:

# FOREWORD

*Safety is The Number One Value at NTPC – a core value that must never be compromised. A genuine focus on safety will improve all other aspects of our organization.*

*The Standard of Safety at NTPC is quite simple: carefully plan each job, identify all hazards, and put all controls in place before starting work. Never conduct work in a dangerous manner: stop work immediately, report the danger to your manager, and do not start work again until it is safe to do so. NTPC will fully support this process, always.*

*At NTPC we care about all of our employees, as well as our contractors and members of the public. We never want anyone to put getting the job done ahead of the health and safety of themselves or others. Therefore, it is NTPC's Safety Guarantee that the Board, President, all Directors, and all Managers will do everything in our power to ensure our workers go home safely each and every day. My challenge to you is this: Will you do everything in YOUR power to ensure you and your co-workers go home safely each and every day?*



Emanuel DaRosa, President and CEO

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# SECTION 1: INTRODUCTION

## NOTES

## 101 H&S Management System

The NTPC Health & Safety Management System (HSMS) applies to all NTPC workers, contractors, and visitors. It does not limit or detract from the responsibilities contained within current legislation pertaining to workplace health & safety.

The objectives of the HSMS are to:

- Reduce or eliminate accidents.
- Describe the controls and procedures in place to reduce or eliminate accidents and to manage incidents.
- Consistently meet legislative requirements regarding health & safety management, performance, and reporting in accordance with the requirements of:
    - NWT Safety Act 1988
    - NWT Occupational Health & Safety Regulations 2015
    - Workers' Compensation Act 2007
    - Workers' Compensation General Regulations 2010
- Facilitate a positive working relationship between management and workers through effective communication.
- Provide, control, and archive all documents relevant to the HSMS as evidence of conformity with the requirements of effective program management.
- Align with the 14 elements of the Northern Safety Association (NSA) Safety Program to

be eligible to achieve and maintain Certificate of Recognition (COR) safety certification.


- Communicate the policies, targets, and objectives of the HSMS within the organization.
- Provide a basis for management and workers to discuss health & safety procedures and accident prevention measures.
- Develop the awareness of both management and workers for the identification of potential hazards and the corrective actions necessary to eliminate accidents.
- Continue to develop the HSMS in consultation with both management and workers.

## 102 H&S Management System Structure

The NTPC Health & Safety Management System (HSMS) consists of the HSMS Manual, 31 elements, more than 70 forms, numerous Safe Work Practices, and numerous Safe Job Procedures.

**HSMS Manual**

- Introduction to the HSMS
- List of documents in the HSMS
- Glossary of all terms in the HSMS elements

**Elements**

- A series of documents that cover specific program management issues
- Provide an integrated, uniform, company-wide application of health & safety management

**Forms**

- Tools used to record and document information in support of the HSMS

**Safe Job Procedure**

- Steps to carry out a job safely and efficiently

**Safe Work Practice**

- Guidelines for the safe performance of a task/activity
- Typically incorporated into Safe Job Procedures

**HSMS Elements**

| Core Elements | Appendix Elements |
|---|---|
| • 01 Health & Safety Policy<br>• 02 Hazard Assessment & Control<br>• 03 Safe Work Practices<br>• 04 Safe Job Procedures<br>• 05 Company Rules<br>• 06 Personal Protective Equipment<br>• 07 Preventative Maintenance<br>• 08 Training and Communication<br>• 09 Health & Safety Inspections<br>• 10 Incident Reporting and Investigation<br>• 11 Emergency Preparedness and Response<br>• 12 Records and Statistics<br>• 13 Legislation | • 14.01 Project Safety Planning<br>• 14.02 Contractor Safety Management<br>• 14.03 Work Protection Code<br>• 14.04 JOHSC<br>• 14.05 Hearing Protection<br>• 14.06 Equipment<br>• 14.07 Respiratory Protection<br>• 14.08 Fall Protection<br>• 14.09 WHMIS<br>• 14.10 Working Alone or in Isolation<br>• 14.11 Discrimination, Harassment, and Violence<br>• 14.12 Ergonomics and Manual Handling<br>• 14.13 Confined Spaces<br>• 14.14 Return to Work<br>• 14.15 Arc Flash<br>• 14.16 Asbestos Management<br>• 14.17 First Aid |

# 103 Policy S-01: Health & Safety

**Purpose**
The purpose of this policy is to provide a framework for the management of health & safety at the Northwest Territories Power Corporation (NTPC) and to demonstrate NTPC's commitment to managing and improving workplace health & safety (H&S).

**Policy Statement**
NTPC is committed to preventing occupational illness and injury by meeting, if not exceeding, all regulations while providing a safe and healthy workplace for employees, contractors, and the general public. NTPC continuously strives to achieve excellence in safety performance and to be recognized as an industry leader in accident prevention. Our overall objective is to incur zero high risk safety incidents and zero lost time injuries.

**Guidelines**
The following principles are at the core of NTPC's Health & Safety Management System:

- All incidents are preventable;
- Management is responsible for providing a safe and healthy workplace;
- All employees are responsible for H&S;
- Employee involvement in H&S is essential;
- Training to work safely is essential; and
- Contractors must meet or exceed NTPC health & safety requirements.

To provide and maintain a safe and healthy workplace, NTPC will:

- Develop and implement health & safety programs based on legislation, standards, and best practices to ensure that all risks to health & safety in the workplace are identified, assessed, eliminated or controlled;
- Take all reasonable precautions to ensure the health & safety of every person;
- Ensure contractors working on NTPC projects and sites follow all applicable health & safety legislation, standards, best practices, and rules;
- Consult with employees and implement agreed health & safety improvements and programs;
- Integrate safety planning and practice into all aspects of design, supply, construction, operations, maintenance, and administration;
- Ensure hazard identification, assessment, and control is completed for all work;
- Provide safe systems of work to reduce incidents and the risk of injury to workers;
- Provide adequate information, instruction, training, and supervision to ensure all workers can undertake their duties safely;
- Ensure all visitors to the workplace are informed and instructed on site safety requirements and are provided with adequate supervision and protective equipment; and
- Provide appropriate resources to implement this policy.

**Roles and Responsibilities**

- Everyone has a responsibility to prevent injuries and illness.
- The Employer (NTPC) accepts responsibility for implementation of the Health & Safety Policy and the success of the Health & Safety Management System, providing the safeguards required to ensure a safe and healthy workplace.
- Management is accountable for health and safety performance. Management and supervisors are responsible for developing positive attitudes toward health & safety in themselves and their workers. Management will implement a top quartile Health & Safety Management System as well as obtain input from employees and their representatives.
- All workers are accountable for working safely and have the right and the responsibility to contribute to safe work. Workers are required to adhere to all aspects of the Health & Safety Management System, including compliance with all rules and regulations. They are responsible to continually practice health & safety while performing their duties.

## Health & Safety Policy Statement

NORTHWEST TERRITORIES POWER CORPORATION
*Empowering Communities*
An NT Hydro Company

# Health & Safety Policy

NTPC is committed to preventing occupational illness and injury by meeting, if not exceeding, all regulations while providing a safe and healthy workplace for employees, contractors, and the general public.

NTPC continuously strives to achieve excellence in safety performance and to be recognized as an industry leader in accident prevention. Our overall objective is to incur zero high risk safety incidents and zero lost time injuries.

The following principles are at the core of NTPC's Health and Safety Program:

- All incidents are preventable;
- Management is responsible for providing a safe and healthy workplace;
- All employees are responsible for health and safety;
- Employee involvement in health and safety is essential;
- Training to work safely is essential; and
- Contractors must meet or exceed NTPC health and safety requirements.

Emanuel DaRosa
*President & CEO*

Brendan Bell
*Chairman, Board of Directors*

## 104 Management Commitment

NTPC's Mission, Vision, and Value statements guide its future direction of meeting, or exceeding, the expectations of its shareholder and customers.

**Mission**
NTPC's mission is to generate, transmit and distribute electricity in a safe, reliable, efficient, and environmentally sound manner; striving to reduce reliance on fossil fuels. NTPC exists to provide value to its shareholder and customers through the efforts of a highly dedicated, skilled, and productive workforce.

**Vision**
Our vision is to be the provider of choice to our customers, a valuable partner to industry and Aboriginal groups in the NWT, as well as a performance leader in the utility industry. As a performance leader, NTPC will develop a highly innovative team that achieves operational excellence, provides industry-leading customer satisfaction, and delivers superior financial performance by demonstrating fiscal responsibility and pursuing growth opportunities.

NTPC will also work with stakeholders to support development of the tremendous resource potential of the NWT in a sustainable and responsible manner creating long-term benefits for its customers and residents alike.

**Values**

While achieving the Corporation's Vision and Mission, NTPC will uphold its core values of:

- Putting the safety of our employees and the general public first;
- Protecting the environment and working towards a sustainable existence; and
- Complying with all applicable legislation and regulations

NTPC will act ethically and honestly; treating employees, customers, and all other stakeholders with Respect, Integrity, and Professionalism.

# SECTION 2: GENERAL RULES

## NOTES

## 201 Three Basic Rights of Workers

Under occupational health and safety legislation workers have 3 basic rights:

**Right to Know** about actual and potential hazards in the workplace and how to control them.

**Right to Participate** in workplace health and safety (e.g., through a workplace health & safety representative or through involvement in the Joint Occupational Health & Safety Committee).

**Right to Refuse** unsafe work. In the NWT Safety Act "unusual danger" means, in relation to any work, a danger to the health or safety of the worker or of any other person:

- that does not normally exist in that work; or
- under which a worker would not normally carry out the work.

A worker may refuse to do any work where the worker has reason to believe that:

- there exists an unusual danger;
- the carrying out of the work is likely to cause an unusual danger to exist; or
- the operation of any tool, appliance, machine, device or thing is likely to cause an unusual danger to exist.

## 202 NTPC Safety Principles

The NTPC Safety Principles are the foundation of our Health & Safety Management System and our safety culture. The NTPC Safety Principles are as follows:

- All injuries can be prevented.
- No task is so important, no schedule so urgent, that the job cannot be done safely.
- Everyone's involvement in safety is essential.
- Open, honest, and effective safety communication is essential.
- Management is accountable for providing a safe working environment.
- Each employee is responsible for their own safety and health, as well as for promoting the safety and health of their co-workers.
- Training employees to work safely is essential.
- Working safely is a condition of employment.

## 203 NTPC Life-Saving Rules

The NTPC Life-Saving Rules are safety rules that, if broken, could result in serious injury or death. Adherence to the Life-Saving Rules helps keep us safe. NTPC takes these rules very seriously. They shall be understood and adhered to at all times by all employees, contractors, and visitors at NTPC sites.

NTPC cannot tolerate critical to life safety violations. If these Life-Saving Rules are not followed, management shall investigate and take immediate and appropriate action in accordance with

the Progressive Discipline Policy.

**10 NTPC Life-Saving Rules**

1. **Work Protection**: For all work that requires work protection I will verify the isolation of hazardous energy, lock-out, and tag-out before work begins.
2. **Isolated Equipment**: I will never interfere with or use equipment that has been locked and/or tagged out.
3. **Electrical**: I will only work on electrical equipment that I am qualified and authorized to work on.
4. **Fall Protection**: I will use fall protection when working at heights in excess of 3 m.
5. **Drugs & Alcohol**: I will not work or drive while under the influence of alcohol or drugs.
6. **Safe Driving**: While driving I will operate in a safe manner, follow speed limits and road rules, wear my seatbelt, and not use my phone.
7. **Personal Protective Equipment (PPE**): I will wear the required PPE at all times.
8. **Mobile Equipment**: I will not operate any mobile equipment unless I am competent and authorized.
9. **Confined Spaces**: I will not enter a confined space unless I am qualified and authorized.
10. **Incident Reporting**: I will report all incidents, including injuries and near-misses.

## 204 Smoke Free Workplace

NTPC recognizes the health hazards associated with tobacco use in the workplace, both to smokers and non-smokers. NTPC does not permit the smoking of tobacco, in any form, by its workers or the general public in NTPC workplaces.

The following rules apply to all NTPC workers and the general public while in a workplace, transient quarters, coffee room, or vehicle that is leased, rented, chartered, owned, or operated by NTPC.

- Smoking is prohibited within the enclosed worksite.
- Smoking is prohibited within a three metre radius of exits or entrances to the enclosed worksite.
- Workers in breach of these rules may be subject to disciplinary procedures and can be fined up to $500 per offence by WSCC.
- Smoking may be permitted in some locations, such as outdoors or in areas designated by NTPC.
- Assistance for employees who wish to quit smoking is available through NTPC's Extended Health Care Plan (contact NTPC Human Resources) and/or the Shepell Employee & Family Assistance Program (1-800-387-4765).

## 205 Alcohol and Drug Use

NTPC Policy HR-29, Alcohol and Drug Use applies to all NTPC workers while on NTPC business; on NTPC worksites, property, or facilities; and when in vehicles or equipment owned, leased, operated, or in any other manner in service to NTPC. All visitors to an NTPC worksite are expected to be fit for duty and will be escorted from the premises if there are concerns about safety. Contractors are expected to enforce the provisions of this procedure with their employees, sub-contractors, and agents.

NTPC recognizes the negative effects and consequences of drug abuse, including alcohol, medication abuse, and illicit drugs upon the individual abuser and the potential danger to the welfare of the individual abuser and others.

NTPC will develop, implement, and continually improve upon safe practices and procedures that will safeguard all employees and others from drug abuse. This procedure is subject to ongoing review and evaluation, and modifications will be made as deemed necessary to respond to changing circumstances and evolving needs.

## 206 Vehicle Driving

All workers who drive NTPC vehicles are required to have and maintain a valid driver's license, obey all traffic laws, and report any traffic infractions/ tickets/accidents etc. to the appropriate manager.

Workers shall not operate NTPC vehicles while under the influence of alcohol and/or drugs. This includes any prescription or non-prescription drugs that may impair a worker's judgment while driving. Any worker driving an NTPC vehicle while under the influence of alcohol and/or drugs may be dismissed.

**Drivers**

- All drivers shall carry a valid driver's license and ensure the proper insurance and registrations are in the vehicle at all times.
- No passengers are allowed in NTPC vehicles unless preauthorized by a manager.
- Drivers must complete a visual inspection of the vehicle & complete daily vehicle inspection sheet.
- Seat belts shall be worn at all times.
- All drivers shall obey and follow the speed limits.
- All incidents involving an NTPC vehicle must be reported immediately.
- Smoking is not permitted in NTPC vehicles.
- All NTPC vehicles must be kept clean at all times.
- NTPC vehicles are to be used only for NTPC business unless authorized by management.

## 207 Progressive Discipline Policy

All workers shall follow NTPC health & safety rules, Safe Work Practices, and Safe Job Procedures.

If these are not being followed Management shall investigate and take immediate, appropriate action in accordance with the Progressive Discipline Policy.

The Progressive Discipline Policy outlines the level of discipline that may be applied. Managers that see or are made aware of any unsafe acts may need to consult with Human Resources to discuss taking the following actions:

- Verbal Warning
- Written Warning
- Suspension
- Termination

## 208 Safe Limits of Approach

Refer to the back cover of this book for the Safe Limits of Approach table.

***See SWP 3.14: Safe Limits of Approach***

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# SECTION 3: HAZARD ASSESSMENT & CONTROL

## NOTES

# 301 Hazard Assessment and Control

Hazard Assessment and Control is the process used to identify hazards, assess risk, and implement controls to reduce or eliminate the risks associated with a hazard.

The process, as outlined in *Element 02: Hazard Assessment and Control*, has five main components:

- Hazard Identification.
- Risk Assessment.
- Hazard Control Development.
- Hazard Control Implementation.
- Monitoring and Reporting.

**Hazard Identification**

Potential and existing hazards are identified using:

- Worksite Hazard Analysis
- Job Safety Analysis (JSA)
- Tailboard Meetings
- Incident Reports
- Concern Reporting
- Worksite Visits
- Equipment Hazard Assessment
- Ergonomics and Manual Handling Assessment

While Project Safety Plans (PSP), JSAs, and Tailboard Meetings all outline steps, hazards, and controls; the PSP covers projects (high level), JSAs cover jobs (medium level, e.g., engine overhaul), and Tailboard Meetings cover only that day's work including real time site conditions and hazards.

**Hazard Categories**
The following is a list of hazard categories applicable to NTPC operations and the Hazard Assessment and Control program.

- Biological Hazards
- Chemical Hazards
- Environmental Hazards
- Physical Hazards (energy or force)
- Psychological Hazard

**Risk Assessment**
A Risk Assessment is performed to assess each identified hazard and evaluate the risks of an unwanted event associated with that hazard. Risk Assessment shall be conducted using *Form 2.4: NTPC Risk Matrix* (see below) as follows:

- Determine the most reasonable probable consequence that could result from the unwanted event. Identify the corresponding factor in the table.
- Determine the frequency of exposure to the specific situation or condition (hazard). Identify the corresponding factor in the table.
- Determine the probability of the unwanted event given the most likely reasonable consequence and the frequency of exposure. Identify the corresponding factor in the table.
- Add the three factors together to determine the Risk Score.
- Compare the Risk Score to the Risk Level.
- Provide the document for review and sign-off to the applicable person as per the Minimum Notification Review.

| Risk Matrix | | | |
|---|---|---|---|
| **Factor** | **Consequence** | **Exposure** | **Probability** |
| 6 | **Catastrophe**: numerous fatalities; damage over $5 million; major disruption to activities. | **Continuous**: Occurs many times daily. | **Almost Certain**: The most likely and expected result if the selected complete sequence of events takes place (up to 1 in 10 chance). |
| 5 | **Disaster**: multiple fatalities; damage $1 million to $5 million. | **Frequent**: Occurs daily. | **Quite Possible**: Not unusual (1 in 10 to 1 in 100 chance). |
| 4 | **Very Serious**: fatality; damage $500,000 to $1 million. | **Occasional**: Occurs weekly to monthly. | **Unusual but Possible**: Unusual but possible sequence or coincidence (1 in 100 to 1 in 1,000 chance). |
| 3 | **Serious**: serious injury (amputation, permanent disability); damage $5,000 to $500,000. | **Infrequent**: Occurs monthly to yearly. | **Remotely Possible**: Remotely possible coincidence (1 in 1,000 to 1 in 10,000 chance). |
| 2 | **Medical Treatment**: medical treatment injury; damage up to $5,000. | **Rare**: Occurs about once a decade. | **Conceivable**: Has never happened after many years' exposure, but is conceivably possible (1 in 10,000 to 1 in 100,000 chance). |
| 1 | **First Aid Treatment**: minor cuts, bruises, bumps; minor damage. | **Very Rare**: Has never been experienced. | **Practically Impossible**: Has never happened anywhere, an almost impossible sequence (1 in 100,000 or lower chance). |

| **Risk Score** | **Risk Level** | | **Minimum Notification Review** | **Risk Calculation Method** |
|---|---|---|---|---|
| 15-18 | **Extreme** | Exceeds the risk acceptance threshold. Unacceptable for work to proceed. | President | 1) Determine the most reasonable probable consequence that could result from the unwanted event. Identify the corresponding factor in the table.<br>2) Determine the frequency of exposure to the specific situation or condition (hazard). Identify the corresponding factor in the table.<br>3) Determine the probability of the unwanted event given the most likely reasonable consequence and the frequency of exposure. Identify the corresponding factor in the table.<br>4) Add the three factors together and determine the Risk Score.<br>5) Compare the Risk Score to the Risk Levels and Actions. |
| 10-14 | **High** | Exceeds the risk acceptance threshold. Requires proactive management. | Director | |
| 6-9 | **Moderate** | Lies on the risk acceptance threshold. Requires active monitoring. | Manager | |
| 3-5 | **Low** | Acceptable risk. | Worker | |

**Hazard Control Development**
Hazard controls are measures taken to reduce the risks associated with hazards in the workplace. An appropriate solution shall be selected to control each hazard.

There are five basic ways to control hazards. These form a hierarchy:

- Elimination
- Substitution
- Engineering
- Administrative
- Personal Protective Equipment

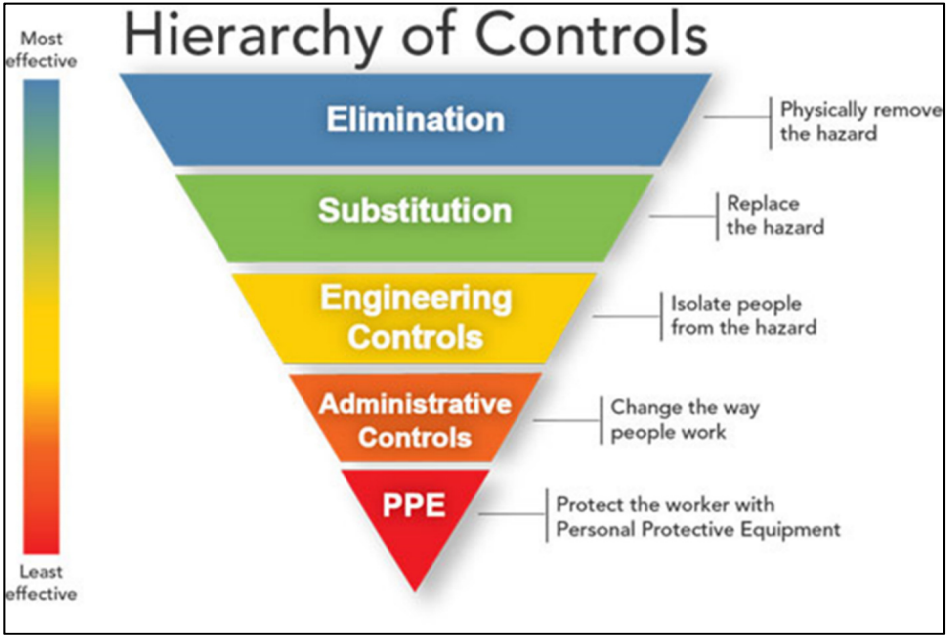
Elimination is the most effective and shall be the first control to be considered. If elimination is not possible then the next control shall be considered, and so on.

The least effective control is Personal Protective Equipment – this is the last resort to be taken when controlling hazards.

The higher the control is in the hierarchy, the more effective and sustainable it is. The lower the control is in the hierarchy, the more participation and supervision is required.

Hazard control is often more effective when controls from several different levels are put in place.

***See Element 02: Hazard Assessment and Control***


Hierarchy of Controls
Most effective
Least effective
Elimination
Physically remove the hazard
Substitution
Replace the hazard
Engineering Controls
Isolate people from the hazard
Administrative Controls
Change the way people work
PPE
Protect the worker with Personal Protective Equipment

## 302 Job Safety Analysis

A Job Safety Analysis (JSA) is a work planning process that includes safety as an integral factor in the way the job is done. It ensures:

- Qualified and/or competent workers are allocated for each task.
- Sufficient equipment/materials/resources are allocated for each task.
- All workers involved are aware of and follow a safe system of work.

A JSA shall be completed for *work activities* with no Safe Job Procedure yet in place. For the sake of the JSA process *work activities* are defined as activities/jobs/tasks complex enough to require written instructions that could, before controls are in place, reasonably result in at least:

- A Medical Treatment injury.
- Medium property/environmental damage.
- Medium production loss.

Development of a JSA is done on *Form 2.2: Job Safety Analysis* and involves:

- **Step-by-Step Procedure**: List the steps required to perform the job in the sequence they are carried out.
- **Hazard Identification**: For each job step list the hazards that could cause harm when the task is performed.
- **Hazard Controls**: List the control measures required to eliminate or minimize the risk of harm arising from each identified hazard.

- **Action By:** Write the name of the worker responsible to implement the control measure identified.
- **Risk After Controls**: Using the risk matrix at the bottom of the form, evaluate the risks of an unwanted event associated with each hazard with the controls in place.
- **Requirements and References**: List the specific requirements and references required to perform the activity (e.g., worker names, training & qualifications, duties & responsibilities, required Work Protection, hazardous products used, equipment, emergency procedures).

Development of the JSA shall be completed with the full participation of all workers involved in the completion of the work.

The completed JSA shall be reviewed and signed by the supervisor prior to starting work. If any High/Extreme Risk Levels exist, the JSA shall be reviewed and signed by the Director/President, respectively.

All workers shall read and sign the JSA in the section "*Reviewed, understood, and signed by all onsite workers*".

Completed JSAs for repetitive or routine tasks shall be entered into Safe Job Procedure format.

***See Element 02: Hazard Assessment and Control***

## 303 Tailboard Meetings

Tailboard Meetings are conducted to inform workers of all possible hazards and risks associated with a job.

Tailboard Meetings shall be documented on *Form 2.3: Tailboard Meeting*.

The supervisor of a work group shall ensure that the Tailboard Meeting takes place; however the meeting may be led by any worker.

Tailboard Meetings shall be conducted for all work, regardless of the number of workers present or involved.

Tailboard Meetings shall be conducted at the worksite prior to any work beginning and again if the personnel, scope, or conditions of the work change.

Completed Tailboard Meeting forms shall be kept:

- On the project file; and
- On file at the plant for two years.

***See Element 02: Hazard Assessment and Control***

## 304 Safe Work Practices

Safe Work Practices (SWP) are guidelines for the safe performance of tasks and the safe use of tools and equipment.

SWP are developed for work tasks based on *Form 2.1: Worksite Hazard Analysis Database* and for equipment based on *Form 14.06.1: Equipment Hazard Identification & Risk Assessment*.

A Safe Work Practice shall be developed for each task and piece of equipment to allow for the correct and safe performance of the task and use of the equipment.

Safe Work Practices are available on the NTPC PowerLine, as well as in the *NTPC Safe Work Practices Manual*. A complete listing of Safe Work Practices is available on *Form 0.0: Document Control Register*.

SWPs shall be adhered to at all times. They shall be reviewed and referenced in Tailboard Meetings, Job Safety Analyses, Project Safety Plans, and Safe Job Procedures. Not following Safe Work Practices can result in progressive discipline.

***See Element 03: Safe Work Practices***

## 305 Safe Job Procedures

Safe Job Procedures (SJP) are developed for routine jobs to allow for the correct and safe performance of the job. SJPs are developed through the following steps:

- Complete Job Safety Analysis (JSA)
- Field test JSA
- Improve and finalize JSA
- Migrate JSA into Safe Job Procedure format

Safe Job Procedures are available on the NTPC PowerLine. A complete listing of Safe Job Procedures is available on *Form 0.0: Document Control Register*.

SJPs shall be adhered to at all times. They shall be reviewed and referenced in Tailboard Meetings, Job Safety Analyses, and Project Safety Plans. Not following Safe Job Procedures can result in progressive discipline.

***See Element 04: Safe Job Procedures***

# SECTION 4: PERSONAL PROTECTIVE EQUIPMENT

## NOTES

## 401 Management of PPE

Personal Protective Equipment (PPE) shall only be used in conjunction with guards, engineering controls, and/or sound work practices. It shall not be relied upon as the only means of protection against hazards. Wherever possible hazards shall be eliminated or controlled, with PPE to help provide protection against hazards that cannot be otherwise reasonably controlled.

Care shall be taken to recognize the possibility of multiple and simultaneous exposures to a variety of hazards. Adequate protection against the highest level of each hazard shall be provided.

PPE shall be kept in a sanitary and reliable condition.

Careful consideration shall be given to the comfort and fit of PPE. PPE devices shall be available in a variety of sizes.

In cases where items of PPE are required to be worn together no piece shall compromise the protection provided by another.

The worker's manager shall authorize the issue of all PPE and shall maintain a complete record of all PPE issued to the worker using *Form 6.1: Issue of Personal Protective Equipment*. A copy of the form shall be kept on the worker's Human Resources file.

PPE shall be issued upon initial hire and when additional equipment is required for tasks normally performed by the worker. If and when PPE is damaged or worn out through normal use, the manager shall authorize the replacement of the PPE using a requisition. The original PPE shall be returned to the manager for either repair or disposal.

Upon reassignment, retirement, or termination of the worker, all PPE shall be returned to the manager who shall record it on the *Issue of Personal Protective Equipment* form kept on the worker's Human Resources file.

**See *Element 06: Personal Protective Equipment***

## 402 PPE Purchase

Safety equipment (e.g., PPE, fire extinguishers, first aid kits, signage, spill response products, etc.) is considered a *Restricted Item* as per the *NTPC Purchasing Card Guidelines*. Therefore:

- Safety equipment shall be purchased by requisition from *Form 6.2: Approved HSE Equipment Purchasing List*, which contains all safety equipment approved for purchase by the Health & Safety Department
- Safety equipment shall not be purchased by purchasing card (P-Card).
- Only the Health & Safety and Logistics Departments may purchase safety equipment by P-Card.

NTPC PPE shall be CSA-approved. Newly purchased PPE shall be pre-approved by the Director, Health, Safety & Environment.

**See *Element 06: Personal Protective Equipment***

## 403 PPE Cleaning and Maintenance

PPE shall be inspected, cleaned, and maintained by workers at regular intervals as part of normal job duties so that the PPE provides the requisite protection. Managers are responsible for ensuring compliance with cleaning and maintenance.

If an item of PPE is in need of repair or replacement it is the responsibility of the worker to bring it to the immediate attention of the manager. PPE that is in disrepair or is not able to perform its intended function shall not be worn.

Contaminated PPE which cannot be decontaminated shall be disposed of in a manner that protects employees from exposure to hazards and in compliance with environmental regulations.

***See SWP 4. 1: Personal Protective Equipment, Element 06: Personal Protective Equipment***

## 404 Care and Inspection of PPE

**Hard Hats:** shall be inspected for cracks and damage prior to daily use. Hard hats shall be cleaned as necessary with a mild soap and water solution. Damaged hard hats and accessories (e.g., suspensions, chin straps, winter liners) shall be replaced immediately.
***See SWP 4.06: Hard Hats***

**Ear Muffs:** shall be inspected regularly and cleaned as necessary using a mild soap and water solution. Pads and liners may be replaced when damaged or heavily soiled.
***See SWP 4.08: Hearing Protection***

**Cotton Coveralls:** shall be cleaned using regular laundry facilities. Cuts and abrasions in the fabric may be repaired using common thread, sewing techniques, and iron-on patches as required.
***See SWP 4.07: Skin Protection***

**Flame Resistant Clothing:** shall be laundered as per the manufacturer's recommendations using commercial laundry facilities. Torn garments shall be repaired with flame resistant thread at commercial establishments or by the original equipment supplier. Personalization of flame resistant clothing to add names, logos, or trades must be pre-approved by the manager to ensure changes will not affect the flame resistant qualities of the garments
***See SWP 4.03: Arc Flash PPE***

**Safety Glasses** (both prescription & non-prescription): shall be cleaned using a lens cleaning solution and lens cleaning cloth. Damaged lenses and removable side shields shall be replaced by the supplier.
***See SWP 4.02: Eye Protection***

**Gloves:** shall be replaced when heavily soiled, heavily worn, or torn.
***See SWP 4.05: Hand Protection***

**Rubber Gloves:** shall be visually inspected prior to each use and air tested daily prior to initial use. Gloves that fail the visual and/or air test shall be replaced immediately. Gloves shall be sent for high voltage testing every six months by the Logistics Department.
***See SWP 4.05: Hand Protection***

**Fall Arrest Gear:** shall be kept clean and stored in a dry location. The worker shall inspect the webbing, clips, buckles, latches, and rings for damage prior to each use. All fall arrest gear shall be inspected and repaired by a qualified manufacturer's representative.
***See SWP 5.14: Inspection and Maintenance of Fall Arrest Systems***

## 405 Eye and Face Protection

Standards: *CSA Standard Z94.3: Eye and Face Protectors; CSA Standard Z94.3.1: Selection, Use, and Care of Protective Eyewear*.

Eye protection shall be worn in designated areas as per Table 1 of *Safe Work Practice 4.02: Eye and Face Protection*. Essentially plants, substations, garages, workshops, and worksites require appropriate eye and face protection; while offices, accommodations, control rooms, washrooms, and vehicles normally do not require eye and face protection.

The absence of Eye Protection signs shall not excuse working in potentially hazardous areas without eye protection.

Visitors to worksites requiring access to designated Eye Protection areas shall be provided with suitable eye protection.

Additional eye protection devices shall be used when the risk of eye injury increases above the level of afforded protection. These devices may include screens, shields, goggles, or face shields approved to meet the increased risk of flying or airborne particles.

NTPC Employees who work in a designated Eye Protection area shall be issued a CSA-approved set

of safety glasses with fixed side shields.

NTPC Employees who normally wear prescription eyeglasses and occasionally work in a designated Eye Protection area shall be issued a set of CSA-approved goggles to wear in conjunction with their eyeglasses.

NTPC employees who regularly work in a designated Eye Protection area and require prescription eyeglasses shall be reimbursed by NTPC for a pair of CSA-approved eyeglasses with side shields as per *Element 06: Personal Protective Equipment*.

Any standard protective eyewear that becomes damaged shall be returned to NTPC for repair or replacement.

Workers performing electric arc welding or plasma cutting shall wear an approved industrial eye protector that protects from ultraviolet, visible, or infrared radiation as well as flying molten particles.

A worker shall not perform electric arc welding if another worker could be exposed to radiation from the arc, unless the other worker is using an approved industrial eye protector or is protected from the radiation by an approved screen.

Workers conducting grinding, brushing, or cutting shall wear CSA-approved protective eyewear in combination with a CSA-approved face shield.

Where there is risk of injury to the eye, eyewash stations shall be situated within close proximity to the work being done.

Eyewash stations shall be inspected monthly and eyewash solution shall be refreshed every six months.

***See SWP 4.02: Eye Protection***

## 406 Hearing Protection

Standard: *CSA Standard Z94.2: Performance, Selection, Care, and Use of Hearing Protection Devices*

Noise levels and occupational exposure limits shall be measured and posted in all high noise areas at NTPC facilities in accordance with *Element 14.05: Hearing Protection.*

Suitable hearing protection shall be worn in all high noise areas to reduce the exposure level to below the 80 decibel level.

Workers shall wear approved hearing protection in all designated areas and whenever or wherever exposed to the hazard of noise in excess of the acceptable lower limit and time allowances (see *Table 1: Occupational Exposure Limits – Noise*).

Disposable ear plugs meeting *CSA Standard Z94.2* shall be supplied and worn in areas of the worksite where there is measured noise exposure between 80 and 85 dBa Lex or greater. Ear plugs shall be replaced on a daily basis or whenever they become soiled.

If NTPC personnel are not able to wear the provided ear plugs, they shall be issued cap-mounted ear muffs that are in compliance with *CSA Standard Z94.2.*

**Table 1: Occupational Exposure Limits – Noise**

| Sound Level (dBA) | Max. Permitted Duration (hrs/day) |
|---|---|
| 80 | 16 |
| 85 | 8 |
| 90 | 4 |
| 95 | 2 |
| 100 | 1 |
| 105 | 0.5 (30 minutes) |
| 110 | 0.25 (15 minutes) |
| 115 | 0.125 (7.5 minutes) |
| >115 | 0 |

**Fitting**

- **Ear Muffs**: Cushions must form a seal against the head all around the ear and not rest against any part of the outer ear.
- **Ear Plugs**: Use the opposite hand to open the ear canal. This is done by grasping the top of the ear and gently pulling upwards. The plug, having been compressed, is placed into the ear canal and held in place for about 10 seconds to allow the plug to expand and seal in the ear canal.

***See SWP 4.08: Hearing Protection,***
***Element 14.05: Hearing Protection***

## 407 Foot Protection

Standard: *CSA Standard Z195: Protective Footwear*

Workers shall wear CSA-approved protective footwear with steel toes and sole puncture protection wherever the possibility of injury to their feet exists (marked with a green or yellow triangular CSA label on the right boot – see *Footwear Symbols Table*). This includes:

- any location where any project, construction, or maintenance work is being carried out.
- any location where a worker is exposed to foot injury hazards.
- all areas posted as requiring safety footwear.
- all NTPC power plant facilities, with the exception of offices and accommodations.

Workers exposed to arc flash hazards shall wear CSA-approved footwear with sole electric shock resistance (marked with a white rectangular CSA label containing an orange omega symbol (Ω) on the right boot – see *Footwear Symbols Table*).

Workers operating chainsaws shall wear CSA-approved chainsaw protective footwear.

The absence of *Protective Footwear* signs shall not excuse working in potentially hazardous areas without foot protection.

Individuals on public tours do not require protective footwear if accompanied by a competent worker and/or the hazardous area is separated off or barricaded.

Workers are responsible for ensuring they wear protective footwear; that the footwear is in serviceable condition; and that the footwear is replaced when there is any tear to the boot, wear points with exposed steel toe or shank, or sole damage.

Specialized protective footwear shall be provided to workers that may be exposed to hot, corrosive, or toxic substances. Management shall determine the need for specialized protective footwear and shall ensure all footwear is suitable and adequate.

**Winter Footwear Traction Devices**
Approved winter footwear traction devices (e.g., Yaktrax) shall be worn when working outside for extended periods of time in slippery winter conditions.

Winter footwear traction devices shall not be worn where they will present a slipping hazard:

- Indoors.
- On metal grating (e.g., stairs, walkways).
- On smooth outdoor non-snow/ice surfaces (e.g., pavement, concrete, wood, metal).

***See SWP 4.04: Foot Protection***

**Footwear Symbols Table**

| Marking | Criteria | Use |
|---|---|---|
|  | Green triangle footwear: has sole puncture protection with a Grade 1 protective toe (withstand impact up to 125 joules). | Any industrial or heavy work environment, including construction, where sharp objects are present (e.g., nails). |
|  | Yellow triangle footwear: has sole puncture protection and Grade 2 protective toe (withstand impact up to 90 joules). | Light industrial work environments that need both puncture and toe protection. |
|  | White rectangle with orange Greek letter "omega" footwear: has soles that provide electric shock resistance. | Any industrial environment where accidental contact with live electrical conductors can occur. |
|  | White label with green fir tree symbol footwear: provides protection when using chainsaws. | For forestry workers and others who work with or around hand-held chainsaws and other cutting tools. |

## 408 Head Protection

Standard: *CSA Standard Z94.1: Industrial Protective Headwear*

Hard hats are available in two Types:

- Type 1 hard hats provide protection against impact and penetration from above.
- Type 2 hard hats provide protection against impact and penetration from above and from the sides.

Hard hats are available in a number of styles:

- Cap (provides shade for the eyes and some face protection).
- Full brim (provides fuller protection from falling objects and sunlight, as well as water shedding).
- Peakless (allows clear upward vision).

Hard hats shall be worn when the following potential hazards exist:

- Falling, flying, thrown, or moving objects that could strike the top or sides of the head (e.g., construction, renovation, hoisting).
- Fixed objects that the head could be struck against (e.g., working in tight spaces, under

low piping, on aerial lifts, climbing towers, etc.).
- Energized electrical conductors that could come into accidental contact with the head (e.g., working from poles, ladders, aerial lifts).

The hard hat selected shall be appropriate to the hazards present:

Type 1 hard hats are the minimum standard where hard hats are required.

Type 2 hard hats shall be worn in areas where a side-impact hazard exists.

The absence of *Hard Hat Area* signs shall not excuse working in potentially hazardous areas without a hard hat.

NTPC workers shall wear NTPC-issued hard hats. All NTPC-issued hard hats shall be Class E, CSA-approved.

Contractors and visitors shall wear Class E, CSA-approved hard hats while on NTPC worksites.

Chin straps shall be used while attaching sling loads to a helicopter.

Hard hats shall not be worn backwards.

***See SWP 4.06: Head Protection***

## 409 Hand Protection

If there is a danger that a worker's hand may be injured, workers shall wear properly fitting hand protection appropriate to the work, the work site, and the hazards identified.

Suitable gloves, along with arm protection as required, shall be worn:

- In the presence of hazards such as chemicals, paints, electricity, temperature extremes, and biological substances;
- Where the risk of cuts, lacerations, abrasions, punctures, or burns exist; and
- In the event of prolonged exposure to water.

NTPC shall provide appropriate gloves for everyday use and special hazards, as required. Glove selection shall be based on the performance characteristics of the gloves, conditions, durations of use, and hazards present. One type of glove will not work in all situations (see *Table 2: Glove Selection*).

Gloves shall be of appropriate size to minimize the potential to be pulled into pinch points or rotating equipment due to excess length of finger material or to slide around on hands when trying to grasp items.

Gloves shall be kept clean to maintain function and replaced when heavily soiled or damaged.

**Table 2: Glove Selection**

| Work | Recommended glove |
|---|---|
| Electrical work | Rubber electrical insulated gloves |
| Mechanical work with oil or diesel, Maintenance work, light use of spray chemicals | Grease Monkey 8 mil nitrile gloves |
| Mechanical Work | Mechanics goatskin glove |
| Hoisting and rigging | Leather work gloves |
| Using a grinder | Leather work gloves (wear coveralls or long sleeve shirt to protect arms) |
| Inuvik LNG site | Insulated leather work gloves or cryogenic gloves |
| Varsol parts washing | Snorkel rubber gloves |

***See SWP 4.05: Hand Protection***

## 410 Rubber Insulating Gloves

Leather protective covers shall be used with rubber gloves and never be used separately as work gloves.

Rubber gloves shall be:

- marked with a legible expiry data and shall not be used beyond this date.
- never worn inside out and kept clean.
- stored in the proper container and location.
- visually inspected by worker before each use for test date, corona cracks, and other damage, and given the roll & air test.
- stored away from energized electrical apparatus where ionization or corona may be present.

While wearing rubber gloves workers shall not wear rings, watches, or jewellery that could stress or damage the glove.

Questionable rubber gloves shall not be used and shall be reported immediately to the manager.

Class 2 rubber gloves shall be worn when working on or near up to 17,000 Volts AC or 25,500 Volts DC phase to phase.

Class 0 rubber gloves shall be worn when working on or near up to 1,000 Volts AC or 1,500 Volts DC phase to phase.

***See SWP 3.11: Rubber Insulating Gloves***

## 411 Arc Flash PPE

Standards:

- *CSA Z462.12, Workplace Electrical Safety*
- *CSA Z96: High Visibility Safety Apparel*

Arc flash warning labels shall be applied to all apparatus where potential arc flash hazards exist. Labels contain the following information:

- Apparatus ID, location, and description;
- Voltage;
- Arc Flash Boundary;
- Limited Approach Boundary;
- Restricted Approach Boundary; and
- Required category of arc flash PPE.

There are four types of arc flash labels:

- Caution (Category 0 PPE required)
- Warning (Category 2 PPE required)
- Danger red (Category 4 PPE required)
- Danger black (no safe PPE available – energized work prohibited)

Signage shall be applied to the doors of buildings that contain arc flash hazards. Signs shall indicate that arc flash hazards are present and to refer to the specific arc flash labels before conducting work on specific apparatus.

A face shield is not mandatory when working on or in a control panel, programmable logic controller (PLC) cabinet, or control circuit where the voltage is 120 V or less, as the arc flash hazard is minimal in those

areas. However; shock hazards still exist, so appropriate gloves, eye protection, and insulated tools are still required

Prior to beginning work the boundary furthest from the apparatus (either the Arc Flash Boundary or the Limited Approach Boundary) shall be clearly identified with an easily visible barrier (e.g., signs, tape, cones, barricades) to keep unqualified persons outside of the boundary. The barrier may be placed beyond the farthest boundary to provide additional notification.

If marking the boundary does not provide sufficient warning, an attendant shall be stationed outside of the boundary to ensure no persons enter the boundary. The attendant shall remain in place until the arc flash hazard is gone.

NTPC shall provide workers with the appropriate arc flash PPE.

Arc flash protective flame resistant (FR) clothing (either Category 2 or Category 4, as required) shall be worn when working within the Arc Flash or Approach Boundaries to minimize the risk from arc flash hazards.

Apparatus labelled as Category >4 shall only be worked on in the de-energized state.

Arc flash clothing shall not be worn under non-arc flash clothing, but shall be worn as the outer layer.

Arc flash PPE shall be worn in such a way as to afford maximum protection (i.e., collars closed, cuffs and sleeves worn down and secured).

Arc flash PPE shall be inspected before every use for wear/damage. Even small cuts or tears can greatly reduce the FR protection.

Keep Arc Flash PPE clean as dirt, oil, chemicals, and other contaminants can impede the FR properties.

Only clothing constructed of non-melting fabrics (e.g., cotton) shall be worn beneath the outer layer of arc flash clothing.

Workers exposed to arc flash hazards shall wear CSA-approved footwear with sole electric shock resistance (marked with a white rectangular CSA label containing an orange omega symbol (Ω)).

Arc flash clothing shall be Class 3 high-visibility apparel material (i.e., reflective stripes over the shoulders, around the waist, and encircling both arms and legs).

Tables in *Safe Work Practice 4.03: Arc Flash PPE* describes the arc flash PPE provided and required by NTPC.

**See SWP *4.03: Arc Flash PPE,***
***Element 14.15: Arc Flash***

## 412 Skin Protection

Workers shall protect skin from any harmful substance that may injure the skin on contact or may adversely affect a worker's health if it is absorbed through the skin.

Approved protective clothing, covers, or other safeguard that provides equivalent protection for the worker's skin is required and shall be supplied to protect against specific hazards associated with sparks, molten metal, radiation, chemicals, heat, cold, etc. (e.g., water proof and heat-resistant clothing to be worn during clean-up procedures when working with hot water).

Protective coveralls shall be of appropriate size to avoid becoming entangled in moving machinery or power tools.

Workers shall use clothing and/or sunscreen lotion as required to protect from sunburn.

Workers shall use clothing (e.g., long sleeves, bug jackets, head nets) and/or insect repellant as required to protect from biting insects.

**See SWP *4.07: Skin Protection***

## 413 Respiratory Protection

Standard:

- *CSA Z94.4: Selection, Use and Care of Respirators*

There are three types of respirators:

- Disposable respirators (protection from dust)
- Air purifying respirators (have filters to protect from mechanical and chemical hazards)
- Air supplying respirators (used in oxygen-deficient atmospheres)

RPE shall be worn when:

- A worker is or may be exposed to an airborne contaminant in a concentration exceeding the occupational exposure limits;
- The atmosphere has or may have an oxygen concentration of less than 19.5% by volume; and/or
- A worker is or may be exposed to an airborne bio-hazardous material.

Respiratory Protective Equipment (RPE) shall be kept ready to protect a worker.

RPE shall be stored in a readily accessible location.

RPE shall be stored in a manner that prevents its contamination. It shall be stored to protect against dust, sunlight, heat, extreme cold, excessive moisture, and damaging chemicals.

RPE shall be maintained in a clean and sanitary condition.

Respirators placed in work areas shall be stored in clearly marked containers which are quickly accessible at all times.

All RPE shall be inspected before and after each use to ensure it is in satisfactory working condition.

RPE shall be serviced and used in accordance with manufacturer's specifications.

RPE that is not used routinely but is kept for emergency use shall be inspected at least once every month by a competent worker to ensure it is in satisfactory working condition.

The date of every inspection and the name of the worker who conducted the inspection shall be recorded and conspicuously displayed at the location where the RPE is stored.

The effectiveness of the RPE depends on an effective facial seal. Workers shall be clean shaven where the face piece of the equipment seals to the skin of the face.

All workers shall be fit tested before wearing RPE.

***See SWP 4.10: Respiratory Protective Equipment, Element 14.07: Respiratory Protection***

## 414 Self-Contained Breathing Apparatus

Face masks shall be fit tested prior to each use by the user to ensure there is an air tight seal, the exhaust valve is functional, and the lens seal is intact and functional.

Visual inspections of harnesses, hoses, and respirators shall be completed prior to each use.

Air pressure readings on storage bottles shall be at 75% or greater prior to each use. Storage bottles on escape packs shall be 100% full prior to entry into a confined space or potentially hazardous atmosphere.

Damaged or questionable components on any Self-Contained Breathing Apparatus (SCBA) shall not be used by any worker and shall be reported immediately to the manager.

Damaged or questionable SCBAs, less the storage cylinder, shall be sent for repair & testing at an approved facility before being returned to service.

***See SWP 4.11: Self Contained Breathing Apparatus, Element 14.07: Respiratory Protection***

## 415 Fall Protection Equipment

Standards:

- CSA Z259 series of standards

All fall arrest harnesses, shock absorbers, lanyards, and body belts shall be fitted with a numbered inspection tag which shall also display the item's purchase date.

All fall protection devices and equipment (e.g., harnesses, pole climbing devices, lifelines, lanyards, ascent/descent devices) shall be:

- Provided by NTPC and used in accordance with the CSA standards.
- Visually inspected prior to each use and kept in clean condition.
- Tested and inspected as outlined in *Table 5: Test Interval Table* in *Element 06: PPE*.
- Marked on the identification tag with the last service date.

***See Element 14.08: Fall Protection, Element 06: Personal Protective Equipment, and all Safe Work Practices in Section 5: Working at Heights***

## 416 High-Visibility Clothing

Standard:

- *CSA Z96: High Visibility Safety Apparel*

High-visibility clothing shall have highly reflective properties and/or a colour that is easily discernible from any background, as well as a pattern of retro reflecting parts that helps to distinguish between objects and people.

High-visibility clothing shall be worn by all workers working around mobile equipment to assist operator awareness of worker presence in the area.

Flag persons and workers working on roadways shall wear highly visible reflective clothing and/or traffic vests.

High-visibility vests shall be of the fit that is roomy enough for comfort but fitted enough to avoid becoming entangled or hung up.

Vests should also be adjustable for multiple users.

Vests shall be maintained in a clean fashion to allow for the greatest reflective capability.

Clothing should be comfortable to wear – the parts of the apparel that come into direct contact with the

worker should not be rough, have sharp edges, or have projections that could cause excessive irritation or injuries.

Garments should be selected and worn so that no other clothing or equipment covers the high-visibility materials (e.g., gloves, equipment belts, boots).

High-visibility clothing shall be kept clean and well-maintained. Contaminated or dirty retroreflective materials provide lower visibility.

Replace garments that show signs of wear and tear, soiling, or contamination as they will no longer be able to provide acceptable levels of visibility.

***See SWP 4.09: High-Visibility Clothing***

## 417 Personal Flotation Devices

All operators and passengers of watercraft shall wear approved personal flotation devices (PFD) or life jackets that are appropriately sized.

Life buoys and PFDs shall be permanently stored adjacent to hydro site reservoirs, intakes, and tailraces.

Workers shall wear PFDs and safety harnesses when working in the vicinity of intake structures, head gates, spillways, or tailraces.

## 418 Gas Monitors

Standard:

- *CSA C22.2 No. 152-M1984: Combustible Gas Detection Instruments.*

Personal gas monitors shall be bump tested by the user prior to each day's use.

Gas monitors shall be shop tested at a licensed facility.

Gas monitors shall be field calibrated each month following the annual shop testing or prior to initial use if in storage for more than 30 days.

***See Element 07: Preventative Maintenance***

## 419 Grounds

Grounds shall be visually inspected prior to each use and stored in a clean, dry location when not in use.

Grounds shall be field tested annually using the appropriate resistive test method.

Grounds shall be fitted with a permanent identification tag with an assigned serial number.

***See Element 07: Preventative Maintenance***

## 420 Rubber/Fibre Insulated Tools

Standards:

- *ASTM F696: Leather Protectors for Rubber Insulating Gloves and Mittens*
- *ASTM F711: Fiberglass-Reinforced Plastic Rod and Tube Used in Live Line Tools*
- *IEEE 978: Guide for In-Service Maintenance and Electrical Testing of Live-Line Tools*

All rubber or fibre insulated protective equipment/tools shall be thoroughly inspected for test date, corona cracks, and general condition prior to each use.

All rubber or fibre insulated protective equipment shall be maintained in clean condition, carefully stored in the proper container (e.g., bag, tub, wooden box, line truck) and stowed in a clean, dry area that does not expose the equipment to excessive heat or sunlight.

Any questionable or damaged rubber or fibre insulated protective equipment shall not be used and shall be reported immediately to the manager.

Live line tools shall be inspected prior to each use and shop tested annually. Laboratory testing shall be completed upon failure of the shop test or every two years.

***See Element 07: Preventative Maintenance***

# SECTION 5: TRAINING AND COMMUNICATION

## NOTES

## 501 Safety Orientation

It is the manager's responsibility to ensure that every worker (employees, contractors, consultants) receives an NTPC Safety Orientation prior to starting work with NTPC.

Visitors, delivery personnel, and consultants conducting hands-off work at a work site (e.g., administrative work, tours, photographs, observations) shall be accompanied at all times by a Qualified Worker and do not require an NTPC Safety Orientation, but. However, they shall follow local sign-in procedures.

Principal contractors do not require an NTPC Safety Orientation.

Employees are required to receive the Safety Orientation once at the beginning of their employment with NTPC.

Contractors are required to receive the Safety Orientation annually.

Safety Orientations are provided by management and/or workers (both employees and contractors) that have been authorized to do so.

The NTPC Safety Orientation is an online application that can be completed independently by the worker. It consists of eleven video modules with quiz questions after each module and a final exam.

The Safety Orientation may be administered by a facilitator where an online delivery is not feasible (e.g., large groups, lack of Internet, learning issues).

***See Element 08: Training and Communication***

## 502 Site Orientation

All workers shall receive a Site Orientation prior to beginning work at an NTPC worksite.

An NTPC employee shall receive a Site Orientation for every NTPC worksite where they conduct work; first prior to beginning work at the site and again:

- Annually if the worker has not visited the worksite within the past year; and/or
- Where the worksite has changed significantly.

A contractor worker shall receive a Site Orientation a minimum of once yearly, or more often as required. Delivery drivers do not require a Site Orientation however; the manager shall ensure:

- They are accompanied at all times by a Qualified Worker; and
- Those who take part in unloading freight participate in a tailboard meeting prior to unloading.

Site Orientations shall be provided onsite by a competent worker and documented on *Form 8.1: Site Orientation*.

Visitors (any person who is visiting a facility or worksite for a period of a day or less and who will not perform work at the site) shall receive a Visitor Site Orientation each time prior to entering an NTPC worksite.
Visitor Site Orientations shall be provided onsite by a competent worker and shall be documented on *Form 8.2: Visitor Site Orientation Safety Contract*.

Completed Site Orientation forms shall be submitted to the Training & Development Specialist for filing.

***See Element 08: Training and Communication***

## 503 NTPC Health & Safety Meetings

The purpose of health & safety meetings is to discuss and improve workplace health & safety and to increase employee safety knowledge and awareness. Health & safety meetings help to prevent future workplace incidents.

The main types of health & safety meetings at NTPC:

- Group Health & Safety Meetings
  - Held monthly by work groups with two or more workers.
- JOHSC Meetings
  - Held monthly by each JOHSC (Hydro, Thermal, Hay River).
- Central JOHSC Meetings
  - Held twice per year to review the overall Health & Safety Management System including a review of incident investigations and JOHSC minutes.
- General Health & Safety Meetings
  - Held twice per year for all staff at locations with 10 or more workers.
- Tailboard Meetings
  - Conducted at the worksite prior to work beginning and again if the personnel/scope/conditions change.
- Daily Meetings
  - Conducted to coordinate the activities of several work groups at one plant site prior to any work beginning.

***See Element 08: Training and Communication***

## 504 Group H&S Meetings

Group Health & Safety Meetings shall be held monthly by all groups.

The manager shall ensure Group Health & Safety Meetings are scheduled and held each month.

Attendance is mandatory for all workers except for those on leave, off shift, or in transit, or excused due to operational requirements:

The manager shall keep track of the number of meetings each employee attends each fiscal year.

The meeting agenda shall be prepared beforehand by the Chairperson and shall include:

- review and approval of previous minutes;
- training topic presentation;
- discussion of items that were outstanding at the previous meeting;
- discussion of new health & safety items of interest or concern; and
- arrangements for the next meeting (date, time, location, Chairperson, Secretary, Training Topic Presenter).

The Secretary shall record, document, distribute, and file meeting minutes on *Form 8.3: Group Health & Safety Meeting Minutes*.

***See Element 08: Training and Communication***

## 505 JOHSC Meetings

NTPC shall maintain three Joint Occupational Health & Safety Committees (JOHSC) as follows:

- Hay River JOHSC
- Hydro JOHSC
- Thermal JOHSC

An effort shall be made to include members on the JOHSC from various trades, positions, and backgrounds to have a balanced representation of the NTPC workforce.

JOHSCs shall have a maximum of 8 members as follows:

- Hay River JOHSC
  - Shall represent Hay River employees.
- Hydro JOHSC
  - Shall represent employees in the hydro plants, Yellowknife, Fort Smith, and the associated satellite plants.
  - Shall include membership from Yellowknife, Fort Smith, and the associated satellite plants.
- Thermal JOHSC
  - Shall represent employees in Inuvik, Fort Simpson, and the associated satellite plants.
  - Shall include membership from Inuvik, Fort Simpson, and the associated satellite plants.

- JOHSCs shall be made up of an equal number of management and worker representatives.
- Member selection shall take place annually prior to the first meeting of the fiscal year (i.e., the April meeting).
- Management representation shall not exceed worker representation at JOHSC meetings.
- JOHSCs shall meet on a monthly basis.
- A Central JOHSC consisting of the Co-chairpersons of the three JOHSCs shall meet twice per year.

JOHSC powers and duties include:

- Cooperate with the Health & Safety Department to serve the workplace.
- Hold regular monthly meetings.
- Record and maintain accurate meeting minutes.
- Conduct safety inspections of all facilities represented by the JOHSC a minimum of every three months, or more frequently where deemed necessary.
- Review safety inspections reports quarterly and take appropriate actions to ensure hazards are eliminated or controlled.
- Ensure adequate records are kept on workplace accidents, injuries, and health hazards.

***See Element 14:04: JOHSC***

## 506 Tailboard Meetings

Tailboard Meetings are conducted to inform workers of all possible hazards and risks associated with a job.

Tailboard Meetings shall be documented on *Form 2.3: Tailboard Meeting*.

The supervisor of a work group shall ensure that the Tailboard Meeting takes place; however the meeting may be led by any worker.

Tailboard Meetings shall be conducted wherever two or more workers are present or involved.

Tailboard Meetings shall be conducted prior to any work beginning and again if the personnel, scope, or conditions of the work change.

Completed Tailboard Meeting forms shall be:

- Kept on the project file; and
- Kept on file at the plant for two years.

***See Element 02: Hazard Assessment and Control***

## 507 Daily Meetings

Daily Meetings are conducted to coordinate the activities of several work groups at one plant site prior to any work beginning.

Daily Meetings shall be conducted at the following sites when more than one work group are present:

- Bluefish Hydro
- Fort Simpson
- Fort Smith
- Inuvik
- Snare Hydro
- Yellowknife

Daily Meetings shall be documented on *Form 8.4: Daily Meeting*.

The manager of the plant site shall ensure that the Daily Meeting takes place.

Completed Daily Meeting forms shall be kept on file at the plant for two years.

Each work group shall also conduct a Tailboard Meeting.

***See Element 08: Training and Communication***

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# SECTION 6: INSPECTIONS

## NOTES

## 601 H&S Dept. Plant Safety Inspections

The Health & Safety Department shall periodically visit NTPC plant sites and conduct Health & Safety Department Plant Safety Inspections.

These inspections are carried out to identify any hazards or deficiencies in plant facilities, equipment, and processes and report them to management for correction.

Where practicable, they shall be done in the presence of the Plant Superintendent/Operator.

These inspections shall be recorded on *Form 9.2: Safety Inspection Report*.

Completed reports shall be submitted to the regional manager.

The regional manager shall take the appropriate actions to ensure hazards and deficiencies identified in the inspections are eliminated or controlled.

***See Element 09: Health & Safety Inspections***

## 602 HSE Plant Audits

A Health, Safety & Environment (HSE) Plant Audit is an onsite inspection of all aspects of the workplace including facilities, equipment, and processes in order to note any health, safety, and environmental hazards and deficiencies.

HSE Plant Audits are completed by members of the HSE Division.

Where practicable, HSE Plant Audits shall be completed with the regional manager and Plant Superintendent/Operator present.

After completion of the site visit the HSE Division shall prepare a report noting all hazards and deficiencies.

The audit report shall be submitted to the regional manager who shall assign responsible workers and timelines for the correction of each item.

HSE Plant Audits are completed at all NTPC plant sites on a five-year rotation with a two year follow-up audit schedule to assess action item completion.

***See Element 09: Health & Safety Inspections***

## 603 JOHSC Facility Safety Inspections

The JOHSCs shall ensure all facilities are inspected a minimum of quarterly.

Facility Safety Inspections are carried out to identify any hazards or deficiencies in facilities and equipment and report them to management for correction.

They shall be carried out before the monthly JOHSC meetings by committee members or, in the case of remote sites, the Plant Superintendents/ Operators as part of their regular monthly duties.

Facility Safety Inspections shall be recorded on *Form 9.2: Safety Inspection Report*. Completed reports shall be submitted to the regional manager.

The regional manager shall take the appropriate actions to ensure hazards and deficiencies identified in the inspections are eliminated or controlled.

Completed Facility Safety Inspection reports shall also be provided to the Regional JOHSC and the Health & Safety Department for review.

Facility Safety Inspection reports shall be reviewed a minimum of quarterly at the JOHSC meeting. The JOHSCs shall submit any comments or recommendations to management.

***See Element 09: Health & Safety Inspections***

## 604 Plant Safety Inspections

The manager shall ensure that all plants are inspected a minimum of monthly.

Plant Safety Inspections are carried out to identify any hazards or deficiencies in facilities and equipment and report them to management for correction.

Plant Safety Inspections shall be carried out by Plant Superintendent/Operators as part of their regular monthly duties.

Plant Safety Inspections shall be recorded on *Form 9.2: Safety Inspection Report*.

Completed Plant Safety Inspection reports shall be submitted to the regional manager.

The regional manager shall take the appropriate actions to ensure hazards and deficiencies identified in the inspections are eliminated or controlled.

***See Element 09: Health & Safety Inspections***

## 605 Vehicle & Heavy Equipment Inspections

Regular inspections of vehicles and heavy equipment are necessary to ensure any deficiencies are noted and corrected before they cause injury or damage.

An inspection of each passenger vehicle shall be completed daily by the first worker to use the vehicle each day. The inspection shall be documented on *Form 9.3: Vehicle Inspection*. Weekly inspection items shall be completed by the first worker to use the vehicle each week.

An inspection of each piece of heavy equipment shall be completed on a daily/shift basis by the first worker to use the vehicle that day or shift, documented on *Form 9.4: Heavy Equipment Inspection*.

Any fault or deficiency detected with any aspect of a vehicle or piece of heavy equipment shall be reported to the manager immediately.

If a fault or deficiency is likely to cause injury/damage the vehicle shall be tagged and removed from service immediately until the deficiency is repaired.

Completed inspection forms shall be submitted to the Regional Maintenance Planner at the end of each week.

***See Element 09: Health & Safety Inspections***

## 606 Worksite Visits

Worksite Visits are conducted to observe and document worker compliance with NTPC safety practices and procedures.

Worksite Visits shall be conducted by supervisors (e.g., management, lead hands, Plant Superintendents/Operators, Worksite Monitors).

Upon arrival at the worksite the worker conducting the Worksite Visit (i.e., the inspector) shall contact the Person in Charge and conduct the inspection in their presence, encouraging discussion.

Worksite Visits shall be recorded on *Form 9.1: Worksite Visit*.

A corrective action shall be identified for each unsatisfactory item. Accountability shall be assigned for each corrective action (i.e., responsible party and required date).

It is the responsibility of the inspector to follow up and ensure all action items are completed as assigned.

Completed forms shall be submitted to the inspector's direct supervisor for review and to the Health & Safety Department for filing.

***See Element 09: Health & Safety Inspections***

# SECTION 7: REPORTING & EMERGENCY

## NOTES

# 701 Concern Reporting

A Concern Report is used to document an unsafe situation or condition.

Reporting concerns allows unsafe conditions to be corrected before an incident takes place.

The purpose of the Concern Report Procedure is to:

- Provide an open, structured, and consistent communication channel for workers to report safety, environmental, property damage, and ergonomic concerns; and
- Provide management with a framework to facilitate a timely response to all concerns, regardless of the time period associated with resolution.

Immediate or short-term resolutions for some concerns may not be possible due to operational or financial constraints. NTPC is committed to responding to all concern reports within 30 days of receipt.

Concern Reporting Procedure

- **Worker**
  - Identifies a concern (health, safety, environmental, ergonomic, etc.);
  - Completes Section 1 of *Form 10.4: Concern Report* in detail; and

- Submits form to manager, forwards copy to Director, Health, Safety & Environment (HSE Director).

- **Manager**
  - Reviews form, identifies an appropriate response. Either:
    - Accepts the worker's suggested action to address the concern;
    - Suggests an alternate action to address the concern; or
    - Decides no action is required.
  - Completes Section 2 of form:
    - Lists steps to be taken in response;
    - Assigns a responsible party for each step; and
    - Assigns a due date for each step.
  - Initiates response.
  - Forwards form to Director for review and approval, sends copy to HSE Director.
  - Ensures completion of action items by due date:
    - Records date completed for each step;
    - Follows up to ensure completion of all steps; and
    - Once all steps are complete sends completed form to HSE Director.

- **Director**
  - Reviews concern and resolution;
  - Completes Section 3 of form; and
  - Forwards form to HSE Director.

- **HSE Division**
  - Reviews concern and steps to address concern:
    - If a resolution is not identified, contacts the manager to establish an appropriate response; or
    - If resolution has been identified but is not yet complete:
      - Checks off “Resolution In Progress;”
      - Sends form to initiating employee by email indicating that a response has been identified and the resolution is in progress; and
      - Follows up periodically with the manager to ensure concern is resolved.
    - Once resolution has been completed:
      - Checks off “Resolution Complete;”
      - Completes Section 4 of form;
      - Sends completed form to initiating employee and manager.
  - Records details of concern report and resolution in Form 10.5: Concern Report Register.

***See Element 10: Incident Reporting and Investigation***

## 702 Incident Reporting

When an incident occurs (either a near miss or an accident) the worker shall notify the manager immediately.

The manager shall ensure that any injured workers receive the required medical attention (i.e., first aid or attention from a health care provider).

The worker shall complete *Form 10.1: Incident Report*. If the worker is unable the manager shall complete the form.

The completed incident report shall be submitted to the manager as soon as practicable after the incident and no more than 24 hours after the incident. The manager shall review the incident report, complete page 2, and submit it to the HSE Director within 24 hours of the incident.

In the case of an incident involving a contractor, the supervisor/manager of the contractor shall ensure an incident report is completed by the contractor and sent to the HSE Director.

The HSE Director shall ensure that all incident reports are submitted to the JOHSC for review at their monthly meetings.

***See Element 10: Incident Reporting and Investigation***

## 703 Reporting Injuries to WSCC

Injuries that require medical treatment shall be reported to the Worker's Safety and Compensation Commission (WSCC).

The manager shall ensure that *Element 14.14: Return to Work* is followed.

The injured worker shall complete a *WSCC Worker's Report of Injury* form and submit it to WSCC and the manager as soon as possible after the incident.

The manager shall review the *WSCC Worker's Report of Injury* form and use the information on it to complete the *WSCC Employer's Report of Injury* form. Both forms shall then be submitted to the HSE Director.

The HSE Director shall review the forms and submit them to WSCC within 3 business days of the injury to avoid penalties.

The HSE Director shall act as NTPC's single point of contact with WSCC.

***See Element 10: Incident Reporting and Investigation, Element 14.14: Return to Work***

## 704 Incident Investigation

The purpose of a health & safety incident investigation is to identify the root, direct, and indirect causes of incidents so that controls can be put in place to prevent future incidents. Investigations seek facts in order to improve workplace health & safety, not to find fault or lay blame.

NTPC's shall investigate **all** incidents to:

- Determine what actually happened.
- Identify any unsafe conditions, acts, or procedures.
- Determine the:
  - Direct causes.
  - Indirect causes.
  - Root causes.
- Identify practical corrective actions to prevent similar incidents from occurring.
- Show the commitment of management to have an adequate investigation system in place.

The manager shall ensure all corrective actions are completed by the due date and shall notify the Health & Safety Department of item completion.

The Health & Safety Department shall monitor and track the implementation of the recommendations and corrective actions.

***See Element 10: Incident Reporting and Investigation***

# 705 Emergency Preparedness and Response


The NTPC Emergency Preparedness and Responses Program includes a series of documents designed to facilitate the appropriate preparation for, declaration of, and response to emergencies in order to safeguard people, equipment, and the environment:

NTPC Emergency Preparedness Plan

- *Form 11.1: NTPC Emergency Preparedness Plan* is designed to facilitate an efficient and organized preparedness and response to emergency situations across NTPC.
- *Form 11.1: NTPC Emergency Preparedness Plan* contains the overall emergency preparedness strategy for NTPC, which includes prevention, preparedness, response, and recovery.

Site Specific Emergency Response Plans

- *Form 11.2: Site Specific Emergency Response Plan* shall be prepared and maintained for each NTPC plant site.
- These plans are designed to provide an efficient and organized approach to emergency preparedness and response, and will guide site operations in the event of any anticipated emergency.

Pandemic Emergency Preparedness Plan

- *Form 11.3: Pandemic Emergency Preparedness Plan* is in place to adequately prepare and plan for an uncontrollable pandemic emergency.
- The plan details measures for prevention, preparedness, response, and recovery in the event of a pandemic emergency.

Emergency Declaration Guidelines

- In the event of an incident and anticipated emergency *Form 11.4: Emergency Declaration Guidelines* shall be followed to determine the level of emergency.
- The Emergency Declaration Guidelines include guidelines for the following:
  - Notification of Incident
  - Emergency Declaration and Response
  - Emergency Cancellation
  - Lessons Learned
  - Debrief

Emergency Record

- In the event of an emergency *Form 11.5: Emergency Record* shall be completed.
- The form documents details of the emergency, reasons for declaration, parties notified, resources deployed, lessons learned, and debrief.

***See Element 11: Emergency Preparedness and Response***

# 706 Emergency Declaration Guidelines

Guidelines

In the event of an incident and anticipated emergency, these guidelines shall be followed:

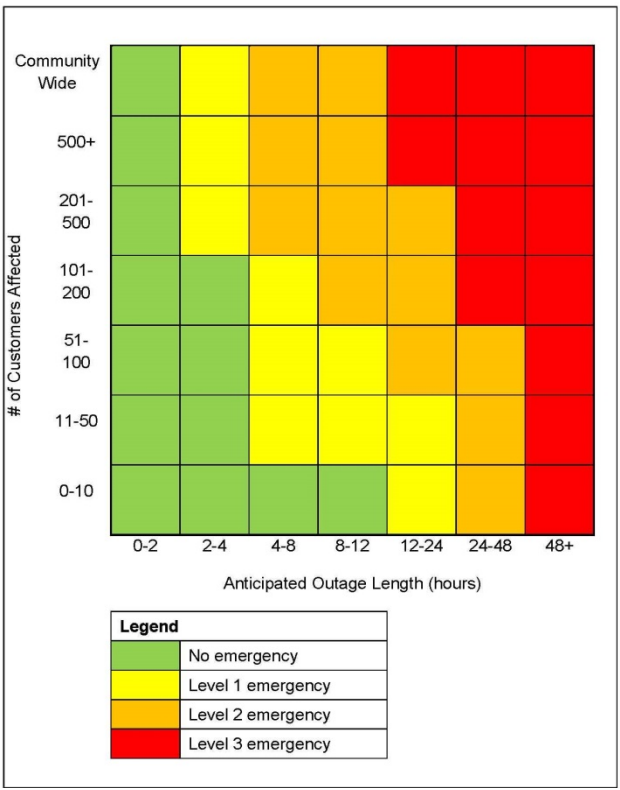
1. Notification of Incident – the worker who detects an incident and **anticipated** emergency shall:
   - Ensure the safety of themselves, their co-workers, and the public.
   - Ensure injured parties receive assistance (e.g., first aid, medical aid).
   - Notify their Manager and request further direction.
2. Emergency Declaration and Response
   - Shall be documented on *Form 11.5: Emergency Record*.
   - Determine the anticipated level of emergency using the *Table 1: Emergency Declaration Guidelines* (below).
   - Manager declares and coordinates response to Level 1 emergencies.
   - Director declares and coordinates response to Level 2 emergencies.
   - President declares and coordinates response to Level 3 emergencies.
3. Emergency Cancellation
   - When the emergency no longer exists, it shall be cancelled by contacting System Control and declaring the emergency "Cancelled." All affected parties shall be notified of the cancellation.

4. Lessons Learned
    - Shall be documented on *Form 11.5: Emergency Record* and communicated to other NTPC groups who could benefit from them.
5. Debrief
    - Meeting shall be held with all staff involved to discuss successes and lessons learned.
    - Send completed *Form 11.5: Emergency Record* to HSE Director for filing.

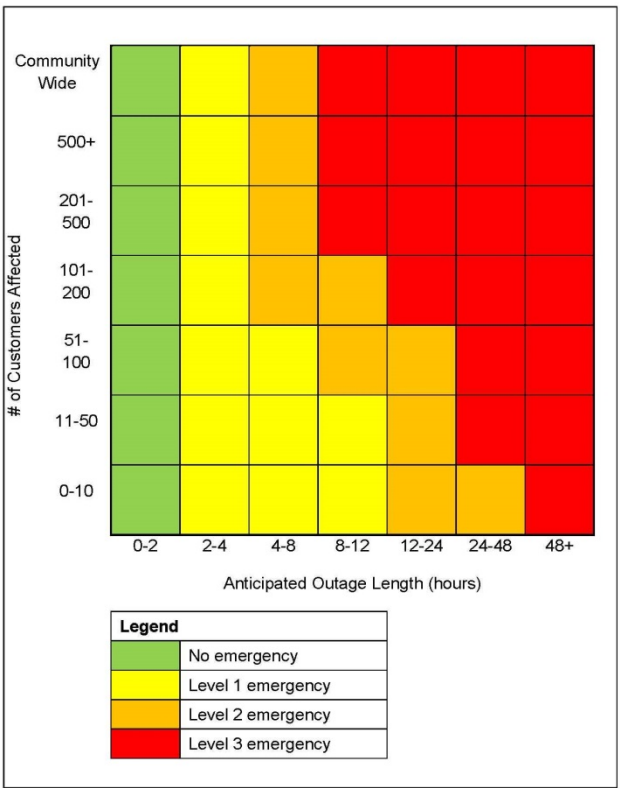
## Table 1: Emergency Declaration Guidelines

| Level 1 – Manager Response Authority |
|---|
| Outage (see Figures 1, 2, 3) |
| Anticipated property damage or process loss ($20k-100k) |
| Anticipated spill to land (1,000-10,000 L) |
| Anticipated spill to water (20-100 L) |
| Emergency agency assistance request |
| Imminent danger to the public (e.g., power line down) |
| **Level 2 – Director Response Authority** |
| Outage (see Figures 1, 2, 3) |
| Anticipated property damage / process loss ($100k-$500k) |
| Anticipated spill to land (10,000-100,000 L) |
| Anticipated spill to water (100-1,000 L) |
| Serious injury |
| Loss of multiple communication channels (data and voice) for over 8 hours |
| Loss of core computing infrastructure for over 12 hours (e.g., Dynamics, data network, records mgmt., email) |
| Loss of SCADA monitoring/control system for >12 hours |
| Malicious intrusion (e.g., virus) affecting systems for over 12 hours |
| **Level 3 – President Response Authority** |
| Outage (see Figures 1, 2, 3) |
| Pandemic Emergency when a Pandemic is declared in the NT |
| Anticipated property damage or process loss over $500k |
| Anticipated spill to land over 100,000 L |
| Anticipated spill to water over 1,000 L |
| Fatality |
| Debilitating injury |

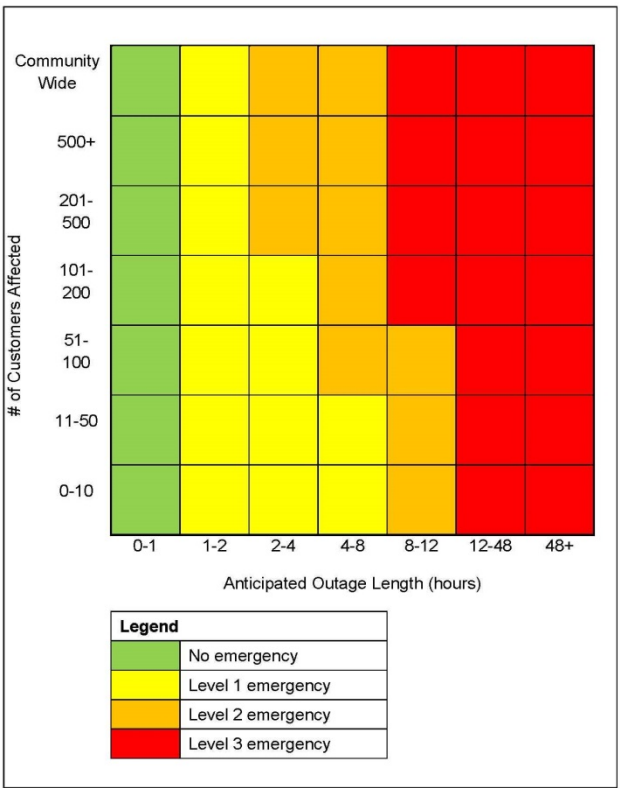
## Figure 1: Emergency Declaration for Outages in Temperatures above $0^0$C



## Figure 2: Emergency Declaration for Outages in Temperatures between $0^0$C and $-30^0$C



## Figure 3: Emergency Declaration for Outages in Temperatures below -30$^0$C



## 707 First Aid

First Aid Equipment

- Each worksite shall have a readily accessible First Aid Station
- First Aid Kits shall be well-marked containers with supplies in amounts adequate for expected emergencies
- First aid supplies and equipment shall be kept clean and dry at all times.

First Aid Attendants

- NTPC shall provide First Aid Attendants for all sites as set out in Schedule G of the *NWT Occupational Health & Safety Regulations 2015*. This is determined by:
  - The travel time from the worksite to the nearest medical facility; and
  - The number of workers at the worksite at any one time.

First Aid Room

- The *NWT Occupational Health & Safety Regulations* require an employer to provide a First Aid Room if there are likely to be 100 or more workers working at a distant or isolated worksite at any one time.
- NTPC does not operate such sites; however NTPC shall provide a First Aid Room at Snare Hydro to be used exclusively for the purposes of administering First Aid.

Transportation of Injured Workers

- NTPC shall provide immediate conveyance and transportation of injured workers to medical aid (i.e., hospital, medical practitioner, or nursing station) for initial treatment.
- Where air transportation is used, stretchers suitable for use in aircraft shall be provided.
- Where an injured worker is transported by stretcher in a vehicle, he or she shall be accompanied by a First Aid Attendant or First Aider who is not the driver of the vehicle.
- Detailed procedures for the transportation of injured workers are contained in the Site *Emergency Response Plan*.

Medical Evacuation (Medevac) Procedures

- In the event that an injured worker requires transportation from a remote site to medical aid, a medical evacuation (medevac) may be required.
- Procedures to be followed to arrange a medevac from Bluefish Hydro and Snare Hydro to medical aid in Yellowknife and from Taltson Hydro to medical aid in Fort Smith are included in the *Site Specific Emergency Response Plan*.

***See Element 14:17: First Aid***

# SECTION 8: HEALTH & SAFETY PROGRAMS

## NOTES

## 801 Hearing Protection

The Hearing Protection program includes:

- Assessment of noise exposures;
- Methods of noise control including engineering controls and administrative arrangements;
- Audiometric testing;
- The selection, use, fitting, and care of hearing protectors;
- Hearing protection training; and
- Maintenance of exposure records.

A noise survey to determine noise exposure levels shall be completed at least every three years where it is likely workers will be exposed to noise levels that exceed 80 dBA.

As far as reasonably practicable, noise hazards shall be investigated and controlled using engineering or administrative controls to ensure workers' occupational noise exposure does not exceed 85 dBA Lex or equivalent.

Hearing testing shall be conducted for:

- Workers regularly exposed to a daily workplace noise level equal to or greater than 85 dBA Lex; and/or
- Workers who regularly work in areas where noise levels are equal to or greater than 90 dBA.

When it is not reasonably practicable to implement engineered sound control measures, or the sound control measures implemented do not reduce the worker's noise exposure to acceptable levels, appropriate hearing protection shall be provided.

Hearing protection training shall be provided to workers regularly exposed to a daily workplace noise level equal to or greater than 85 dBA Lex or who regularly work in areas where noise levels are equal to or greater than 90 dBA. Training shall be provided a minimum of once every 2 years.

Noise monitoring records shall be retained for as long as NTPC is operational and shall be available for onsite review upon request from workers or WSCC.

All work areas where noise exposures may exceed 80 dBA shall be clearly marked by a sign at the entrances and within these areas indicating the range of noise levels.

All employees, visitors, and contractors shall wear hearing protection in posted areas.

***See SWP 4.08: Hearing Protection, Element 14.05: Hearing Protection***

## 802 Fall Protection

NTPC shall ensure the identification of the hazards to which any person (including members of the public) could be exposed as a result of working at heights. These hazards shall be eliminated where reasonably practicable, controlled, or reduced to minimize risks.

Where a worker may fall 3 m or more or where workers are not protected by a guardrail or similar barrier:

- Workers shall use a fall protection system.
- A written fall protection plan shall be developed using *Form 2.1: Job Safety Analysis* referenced in *Element 02: Hazard Assessment and Control*.
- The written fall protection plan shall be referenced in the Tailboard Meeting.

The fall protection plan shall reference the applicable Safe Work Procedures and shall describe the:

- Fall hazards at the worksite.
- Fall protection system to be used.
- Procedures used to assemble, maintain, inspect, use, and disassemble the fall protection system.
- Rescue procedures for if a worker falls or is suspended by a personal fall arrest system.

Safe Work Practices (SWP) are developed and implemented for all fall protection equipment and practices including:

- Safety Lines.
- Anchorages.
- Harnesses, Lanyards, Attachment Hardware.
- Fall Arrest Devices.
- Selection and Use of Pole Straps.
- Ladders.
- Working on Roofs.
- Working over Water.

There are three fall protection systems:

- A control zone.
- A personal fall arrest system.
- A travel restraint system.

These systems shall be used only if other systems such as temporary work platforms and guardrails cannot be used.

The fall protection system chosen for a worker shall be the safest practicable method.

Workers who may be required to use fall protection equipment shall be trained in the use of fall protection equipment and in the application limits, proper anchoring, and tie-off techniques.

***See Element 14.08: Fall Protection, Element 06: Personal Protective Equipment, and all Safe Work Practices in Section 5: Working at Heights***

## 803 Ladders

When a ladder is used, the following steps shall be taken before starting work:

- Conduct a Job Safety Analysis or Tailboard Meeting.
- Install barricades or warning signs if there is a hazard to persons near the work area.
- Ensure the ladder has an angle of 1:4.
- Ensure that the ladder extends at least one metre above the landing.
- Ensure that the ladder is installed on a firm footing.
- Secure the top and bottom of the ladder against displacement.
- Only fibreglass ladders shall be used on NTPC worksites as they are non-conductive.
- Ensure that the ladder will not be used in a manner that endangers any person.

### General Use

- As a general rule, use a ladder as a means of access and not as a place of work.
- No more than one person shall climb or work on a ladder at the same time.
- Always check for electrical and other hazards.
- Never overreach or lean to one side while using a ladder.
- If working outdoors do not use ladders in very windy or wet conditions.

- Do not use a step ladder near the edge of an open floor, hole, excavation, or on scaffolding to gain extra height.
- Avoid working directly over other people.
- Always wear slip resistant footwear.

**Climbing a Ladder**

- When climbing a ladder, always have a minimum of three points of contact (two feet and one hand, or two hands and one foot).
- Face the ladder when ascending or descending.
- Never carry objects while ascending or descending a ladder.
- Do not carry material and tools by hand while ascending or descending a ladder. Secure them safely to the worker's belt, or hoist them to the work location.

**When working on a ladder:**

- Only one person shall be on a ladder at any one time.
- Ladders shall be inspected before use. Defective ladders shall be removed from service immediately and reported to the manager.

***See SWP 5.04: Portable Ladders, Element 14.08: Fall Protection***

## 804 Working on Roofs

Working on roofs applies to work on pitched and flat roofed buildings, structures, or plants and involves several hazards in addition to those related to working at heights.

Hazards resulting from adverse weather conditions shall be anticipated and appropriate precautions taken.

Considerations relating to weather conditions include:

- Conditions of the surface (e.g., wet, dry, dusty, oily, or icy).
- Wind speed. Sheet material, particularly roofing, is difficult to handle and secure safely during windy conditions.
- Glare. Care shall be taken to protect eyes on both sunny and overcast days. Glare can cause vision impairment and obscure warning signs.
- Cold or hot weather. Extreme heat or cold can distract workers at height. Lengthy unprotected exposure can lead to hypothermia, hyperthermia, or heat stress.
- Electrical storms. Work shall not be undertaken on roofs during thunder storms.

***See SWP 5.02: Working on Roofs,***
***Element 14.08: Fall Protection***

## 805 Working over Water

Working over or near water involves several hazards in addition to those related to working at heights. The hazards associated with working over or near water include:

- Falling into the water and drowning.
- Being swept away by fast-moving water causing injury or drowning.
- Falling into the water with electrical equipment and suffering electric shock.
- Falling into cold water in cold conditions and suffering hypothermia.

As the first line of defence against these hazards, appropriate controls shall be used to prevent workers from falling into the water. Adequate water rescue capability shall be available as a second line of defence.

***See SWP 5.03: Working Over Water,***
***Element 14.08: Fall Protection***

## 806 Working on Poles

When climbing or working aloft on poles:

- Workers shall use a suitable fall protection system.
- A written Fall Protection Plan shall be developed using *Form 2.2: Job Safety Analysis* as per *Element 02: Hazard Assessment and Control*.
- The written Fall Protection Plan shall be referenced in the Tailboard Meeting.

The Fall Protection Plan shall reference the applicable Safe Work Practices and shall describe the:

- Fall hazards at the worksite.
- Fall protection system to be used at the worksite.
- Procedures used to assemble, maintain, inspect, use, and disassemble the fall protection system.
- Rescue procedures to be used if a worker falls or is suspended by a personal fall protection system.

***See SWP 3.07: Working on Poles,***
***Element 14.08: Fall Protection***

## 807 WHMIS

The Workplace Hazardous Materials Information System (WHMIS) is a Canada-wide system designed to give employers and workers information about hazardous materials used in the workplace.

Under WHMIS, there are three ways in which information on hazardous materials is to be provided:

- Supplier labels on containers of hazardous materials;
- Safety Data Sheets (SDS) to supplement the supplier labels with detailed hazard and precautionary information; and
- Worker education programs.

Suppliers of hazardous material provide product labels and SDS to employers who in turn pass the information on to workers and provide WHMIS education programs.

The purpose of WHMIS is to give all working Canadians a uniform and appropriate quantity and quality of information about hazardous materials used in the workplace.

WHMIS applies to hazardous materials known as controlled products. Legislation defines controlled/hazardous products and sets out in detail the information suppliers are required to put on labels and SDS.

## Safety Data Sheets


An SDS is a technical document that summarizes the health and safety information about a controlled product.

A Safety Data Sheet (SDS) is readily available to any worker who may be exposed to a controlled product. A SDS is reviewed as part of a hazard assessment before a controlled product is used.

Workers shall obtain an SDS for any new controlled product brought onto the work site. The product shall not be used until the SDS is obtained.

New SDS shall be provided to the Health & Safety Department.

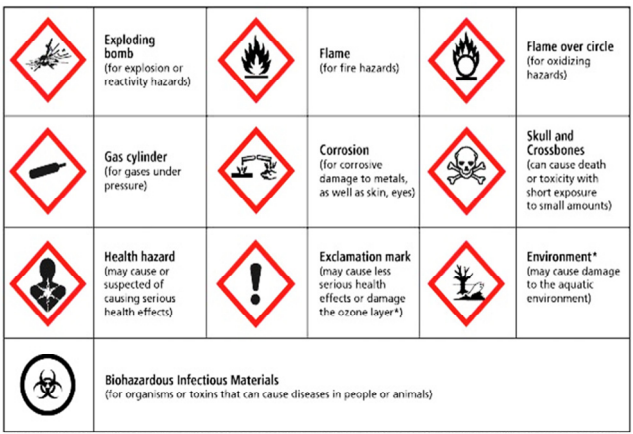
An online database of all NTPC SDS is available to all workers as follows:

- https://www.3eonline.com/eeeOnlinePortal/DesktopDefault.aspx
- Username: ntpc
- Password: msds

NTPC plant sites shall have an up-to-date SDS binder. SDS shall be no older than three years.

## Pictograms

Pictograms are graphic images that immediately show the user of a hazardous product what type of hazard is present.




* The GHS system also defines an Environmental hazards group. This group (and its classes) was not adopted in WHMIS 2015. However, you may see the environmental classes listed on labels and Safety Data Sheets (SDSs) including information about environmental hazards is allowed by WHMIS 2015.

Most pictograms have a distinctive red diamond-shaped border. Inside this border is a symbol that represents the potential hazard (e.g., fire, health hazard, corrosive, etc.). Together, the symbol and the border are referred to as a pictogram. Pictograms are assigned to specific hazard classes or categories.

The graphic above shows hazard pictograms. The bold type is the name given to the pictogram; the words in parentheses describe the hazard.

**Supplier Labels**

All containers shall be clearly marked to identify the contents of the container with either a supplier or workplace label.

A supplier label has three ways to identify the material as a controlled product: a hatch mark border, English and French information, and reference to the SDS.

Containers of controlled products from suppliers are marked with the supplier label.

Supplier labels contain important safety information about the product and should be affixed to the container of controlled product received by NTPC from the supplier. This label shall not be removed, defaced, modified, or altered as long as any amount of the controlled product remains in the container at the worksite.

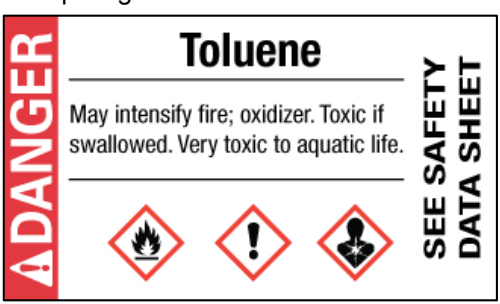
If the supplier label is illegible or is removed or detached, the label shall be replaced immediately with another supplier label or a workplace label.

The image below illustrates a typical supplier label.


## Workplace Labels

When a controlled product is placed in a container other than that received from the supplier, or when the supplier label is removed or becomes unreadable, a workplace label shall be placed on the container.

A workplace label contains the product's name, the precautions for safe use (i.e., use of PPE), and reference to the SDS. It may also contain the applicable pictograms.



A workplace label is not required if:

- A portable container is filled directly from a container with a supplier label or a workplace label;
- All of the product is required for immediate use; and
- The controlled product is:
  - under the control of and used exclusively by the worker who filled the portable container;
  - used only during the shift during which the portable container is filled; and
  - the contents of the portable container are clearly identified on the container.

## Safe Use, Storage, Handling, and Disposal

### Safe Use

- Be aware of the hazardous materials at your worksite;
- Check product label before using any product;
- Follow all warnings and instructions on supplier labels and SDS; and
- Use the protective equipment recommended for each product.

### Safe Storage

- Refer to the SDS (Section 7: Handling and Storage) for storage requirements.

Safe Handling

- Never mix chemicals (unless otherwise instructed to do so);
- Always label new containers when transferring products;
- Handle liquids and powders carefully to prevent splashes and spills;
- Always use personal protective equipment for handling hazardous products; and
- When transferring flammable liquids or explosive substances from one container to another, electrically bond the containers to avoid static charge accumulations.

Safe Disposal

- Refer to the SDS for recommended waste disposal instructions.

**Emergency Procedures for Controlled Product Incidents**

Skin or Eye Contact

- Know and follow directions, cautions, and first aid procedures on label and SDS;
- Flush contaminated eyes immediately with plenty of cool running water. Remove contact lenses. Continue flushing for at least 15 minutes, holding eyelids apart to ensure thorough rinsing; and
- Flush contaminated skin immediately with

plenty of running water for at least 15 minutes.

Swallowing

- Know and follow directions, cautions, first aid procedures on the product's label and SDS.
- Follow label or SDS first aid and emergency procedures that has been swallowed, and call the poison control center immediately.

Inhalation

- Know and follow directions, cautions, and first aid procedures on label and SDS;
- Leave the area and notify the manager if you smell any unusual or exceptionally strong odours.

Spills or Leaks

- Refer to the SDS for recommended waste disposal instructions; and
- Use the appropriate PPE for spill clean-up procedures.

***See Element 14.09: WHMIS***

## 808 Working Alone or in Isolation

The purpose of *Element 14.10 Working Alone or in Isolation* is to provide guidelines for workers to eliminate or reduce risks posed by Working Alone or in Isolation using effective communication systems and hazard assessment.

Working Alone Assessment Checklist

Where workers are Working Alone the worker shall assess the risks in consultation with the manager using *Form 14.10.1: Working Alone Assessment Checklist* to document the nature and location of the work activity, the associated hazards, and the necessary controls (e.g., communication requirements).

Working in Low-Hazard Locations

In low-hazard situations active lone worker monitoring is not required.

Workers working alone in low-hazard locations (e.g., administrative workers) after regularly scheduled hours shall ensure the following measures are in place:

- Access to a conventional phone in the work area;
- The worksite is secure and locked;
- Safe transportation is arranged; and
- Approval from manager to work alone after hours.

Monitoring Center

NTPC contracts Telelink Call Center (hereinafter referred to as the Monitoring Center) to monitor workers Working Alone and to initiate a response to missing workers or emergency assistance requests.

The toll-free phone number for the Monitoring Center is 1-844-638-6872.

There are three Working Alone monitoring methods available:

- SafetyLink Application for Cell Phones (SafetyLink App)
  - For use where cell phone service is available and/or where Wifi service is available
- inReach satellite communication devices
  - For use in Isolated Work (Remote Work and Road Travel)
- Call-in Procedure
  - For use by workers unable to use the SafetyLink App or inReach devices due to availability, connectivity, damage.

The Monitoring Center maintains a database of information supplied by NTPC for contacting users under Working Alone monitoring. User contact information is updated through:

- User Access Request Form
- Acting Delegation and Signing Authority Form

SafetyLink App

For operating instructions refer to the *SafetyLink App Quick Guide* and *SafetyLink App User Manual* on the PowerLine under *Element 14.10: Working Alone or in Isolation*

The SafetyLink App is used to monitor worker wellbeing if they are Working Alone as defined by Element 14.10.

The SafetyLink App provides a two-way method of communication between NTPC workers in service areas and the Monitoring Center.

When the SafetyLink App user 'Signs On' they are monitored by the Monitoring Center.

inReach Devices (Road Travel, Remote Work)

For inReach operating instructions, refer to *inReach Quick Guide* and *inReach User Manual* on the PowerLine under *Element 14.10 Working Alone or in Isolation*.

inReach Satellite Communicators are devices used to monitor the wellbeing of workers in remote locations (e.g., on transmission lines).

inReach devices:

- Are capable of two-way communication, via satellite, between the worker and a remote

Monitoring Center.
- Enable the user to check-in remotely, request assistance, or request emergency services.
- Are monitored by a 24-hour third party Monitoring Center (Telelink).

inReach devices are available for sign-out at the following plant sites from the specified parties:

- Fort Simpson – Issued by the Maintenance Services Manager
- Fort Smith – Issued by the Manager, Operations & Maintenance
- Hay River – Issued by the Stock Keeper
- Inuvik – Issued by the Maintenance Services Manager
- Snare Hydro – Issued by the Hydro Plant Operator
- Yellowknife – Issued by the Supply Chain Logistics Officer

Support

During regular office hours Workers shall contact the NTPC Help Desk (helpdesk@ntpc.com, 867-874-5295) for troubleshooting and technical support.

Outside regular office hours, Workers shall contact the Monitoring Center (1-844-638-6872) for troubleshooting and technical support.

Managers shall contact the NTPC Help Desk (helpdesk@ntpc.com, 867-874-5295) to request additional or replacement devices.

The Information Technology Division shall issue all new devices, provide troubleshooting and technical support, and set up new users and pendants.

Road Travel

Travel on highways between communities and on winter roads is considered Road Travel.

If an inReach device is not available to take on road travel:

- *Form 14.10.2: Road Travel* shall be filled out and submitted to System Control (YKSystemOperators@ntpc.com) prior to departure. The form includes details of the travel, estimated arrival time, same-day return travel information, and contact information so that rescue can be arranged if required.
- Contact System Control (YKSystemOperators@ntpc.com, 867-669-3370) to confirm the form was received and they are aware of the travel plan. Do not depart until confirmation is received.
- The System Operator shall log the departure and begin monitoring the trip, setting a reminder to commence response at the anticipated arrival time.

Upon arrival at the destination:

- Contact the System Operator. The System Operator shall log the arrival and cease monitoring the trip.
- If the System Operator has not heard from a worker within 15 minutes after the scheduled arrival time, they will take steps to locate the worker.

***See Element 14.10: Working Alone or in Isolation***

## 809 Discrimination, Harassment, and Violence

NTPC shall not tolerate any form of workplace discrimination, harassment, or violence by workers, contractors, or members of the public. This includes sexual harassment and abuse of authority.

NTPC shall take all reasonable measures to protect workers from workplace discrimination, harassment, and violence.

Workers shall not conduct discrimination, harassment, or violence against other workers, contractors, or members of the public.

Workers shall report all instances of discrimination, harassment, or violence from workers, managers, contractors, and members of the public.

NTPC shall investigate all formal complaints of workplace discrimination, harassment, or violence.

Discrimination, harassment, or violence by members of the public towards workers shall be documented in an incident report and reported to the RCMP.

Discrimination and Harassment

Discrimination and harassment, including sexual harassment, in the workplace shall not be tolerated.

Violence and Threats of Violence

Violent behavior in the workplace shall not be tolerated.

Any worker who observes conduct that could be considered workplace violence or who has concerns about a situation that could turn violent shall report the situation immediately to a manager.

NTPC shall ensure that any worker who is a victim of workplace violence is advised to consult a health care provider of the worker's choice for treatment or referral.

Procedure for Handling Complaints

A worker who believes he or she has been subjected to workplace discrimination, harassment, or violence is encouraged to clearly and firmly make known to the alleged harasser the objectionable nature of the behavior and request that it be stopped.

If the situation cannot be resolved satisfactorily, the worker shall formally report the problem to the manager.

The manager shall either conduct the investigation immediately or request an investigation by an objective third party Investigator.

All complaints of alleged discrimination, harassment, or violence shall be investigated and, if substantiated, the appropriate corrective actions taken.

The worker has the right to request the assistance of a WSCC Safety Officer to resolve a complaint.

The identity of the worker(s) or the circumstances of the complaint shall not be disclosed except where disclosure is necessary as part of the investigation or disciplinary process/ where required by law.

Both the complainant and the alleged offender shall be informed of the results of the investigation.

Corrective Action

Where a case of workplace discrimination, harassment, or violence has been substantiated, the manager shall take the appropriate corrective actions to resolve the complaint. This may include disciplinary action as per the NTPC Progressive Discipline Policy.

Where harassment has not been substantiated, no action shall be taken against a worker who has made a complaint in good faith.

Nothing in this program prevents or discourages a worker from referring a complaint to the appropriate government agency or exercising any other legal recourse available under the law.

NTPC prohibits any act of retaliation, either direct or indirect, against individuals, acting in good faith, who report incidents of workplace discrimination, harassment, or violence or act as witnesses.

***See Element 14.11: Discrimination, Harassment, and Violence***

## 810 Ergonomics and Manual Handling

Interaction between the worker and the workplace through improper ergonomics and manual handling can cause result in musculoskeletal injuries. These can be caused or aggravated by any of the following:

- Repetitive motions.
- Forceful exertions.
- Vibration.
- Mechanical compressions.
- Sustained or awkward postures.
- Limitation on motion or action.
- Other ergonomic stressors.

Signs and symptoms of musculoskeletal injuries can include tenderness, weakness, tingling, disturbed sleep, swelling, numbness, pain, unreasonable fatigue, and difficulty performing tasks or moving specific parts of the body.

Manual handling shall be done in accordance with *Safe Work Practice 1.07: Manual Lifting & Handling*. Where the use of equipment is not reasonably practicable, all practicable measures shall be taken to minimize the manual handling required or to adapt heavy or awkward loads to facilitate lifting, holding, or transporting by workers.

No worker shall engage in the manual lifting, holding, or transporting of a load that is likely to be injurious to the worker's health or safety by reason of its:

- Weight, size, and/or shape.
- The frequency, speed, or manner in which the load is lifted, held, or transported.

Workers required to lift, hold, or transport loads shall receive the appropriate training in safe methods of lifting, holding, and carrying.

**Keyboard Equipment**

NTPC shall ensure keyboard equipment is properly selected, coordinated and adjusted. This helps to prevent a range of injuries caused by overuse and poor posture.

Generally, the more a keyboard is used, the higher the risk of muscle soreness or injury. This does not mean that people should not use a keyboard extensively in their work; however, job design and adjustable equipment and furniture are important considerations for people who use computers for extensive periods of time.

Where workers report discomfort at work due to the use of keyboards, the manager shall complete an assessment using *Form 14.12.2: Keyboard Workstation Assessment* to assist in the identification of problems associated with individual workstations.

***See SWP 1.07: Manual Lifting and Handling, Element 14.12: Ergonomics and Manual Handling***

## 811 Confined Spaces

Requirements before a Confined Space is Entered

Where a worker is required or permitted to work in a confined space, NTPC shall, before requiring or permitting the worker to enter the confined space:

- Ensure there is a safe entrance to and exit from all accessible parts of the confined space.
- Make all practicable alterations to the physical characteristics of the confined space required to ensure a safe entrance to and exit from all accessible parts of the confined space.

Where reasonably practicable, alternative means to perform work shall be used that will not require a worker to enter a confined space.

Confined Space Monitor

Before a worker is required or permitted to enter a confined space, the manager shall appoint a competent person as the Confined Space Monitor.

Confined Space Entry Plan

A Confined Space Entry Plan is an administrative tool used to document the completion of a hazard assessment for each confined space entry and ensure the health & safety of workers who enter or work in the confined space.

Confined Space Entry Procedures

The Confined Space Monitor shall be responsible for all workers working under their Confined Space Entry Plan.

The Confined Space Monitor shall ensure all necessary equipment is in place and in good working order before the entry is scheduled

The Confined Space Monitor shall make a copy of a Confined Space Entry Plan readily available at the entrance to the confined

Workers shall not enter a confined space until the air has been tested and the following results recorded:

- Oxygen content percentage between 19.5% and 23.5%.
- Explosive/flammable atmospheres less than 10% Lower Explosive Level.
- Carbon monoxide less than 200 parts per million (ppm).
- Hydrogen sulphide less than 10 ppm.

When the cover is removed from an underground vault, maintenance hole, or similar structure, suitable warning devices such as guards or barricades shall be used.

Each worker entering the confined space shall:

- Either be attached to a safety line capable of

extracting the worker in the event of an emergency; or
- Have a suitable means of escape and a self-contained breathing apparatus.

The safety line shall be attached to a mechanical ascent/descent device if an incapacitated worker must be lifted a height greater than 1.2 m.

When a worker is working in a confined space, the air in the confined space shall be:
- Either continuously monitored for oxygen content and hazardous and explosive gases by an audible alarm; or
- Continuously replenished using acceptable mechanical ventilation equipment and periodically monitored for oxygen content and hazardous and explosive gases.

The Confined Space Monitor shall be stationed outside the entry point at all times during the entry process and shall not leave the site when the space is occupied.

When the last worker has left the confined space, the Confined Space Entry Plan may be surrendered by the Confined Space Monitor.

The completed Tailboard Meeting form and all permit tags used shall be attached to the Confined Space

Entry Plan and kept on file at the local plant for a period of two years.

When working in maintenance holes not equipped with permanent ladders, workers shall use non-conductive ladders.

All electrical equipment used in a confined space shall be connected to a ground fault receptacle that shall be tested before the entry, or such equipment shall be battery operated.

Open-cycle portable heaters (e.g., Herman Nelson) shall not be used in the confined space or in a proximity that would allow combustion gases to accumulate in the confined space.

Open flames, welding, cutting, and grinding are not permitted in a confined space unless:

- Constant gas monitoring is conducted and no explosive gases are present; and
- A Hot Work Plan is completed.

Oxy-acetylene equipment shall be removed from the confined space when not in use or when the confined space is vacated.

Hot Work Plan

All hot work shall be completed in accordance with *Safe Work Practice 2.06: Hot Work*. Hot Work Plans shall be documented on *Form SWP 2.06.1: Hot Work Plan*.

The purpose of a Hot Work Plan is to protect workers, the public, and facilities from the hazards associated with hot work activities.

***See Element 14.13: Confined Space***

## 812 Arc Flash

NTPC is committed to establishing and maintaining an Arc Flash program to protect workers from arc flash hazards while working on or near electrical apparatus.

*Element 14.15: Arc Flash* has been developed and the purpose of this element is to provide a framework for the management of arc flash at NTPC and applies to all NTPC workers and contractors working on or near electrical apparatus where the potential for an arc flash hazard exists.

Appropriate arc flash surveys have been conducted at all NTPC locations in accordance with:

- CAN-ULC S801, Guide to Electrical Utility Workplace Electrical Safety
- NFPA 70E Standard for Electrical Safety in the Workplace
- CSA Z462 – Workplace Electrical Safety

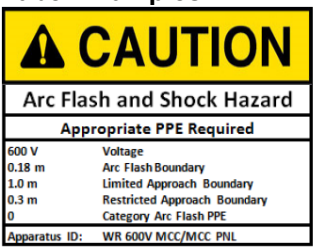
Arc flash warning labels shall be applied to all apparatus where potential arc flash hazards exist.

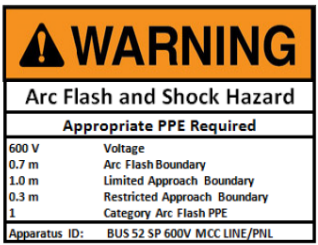
Labels shall contain the following information, as identified in the arc flash surveys:

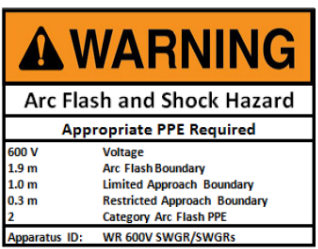
- Apparatus identification, location, and description;
- Voltage;
- Arc Flash Boundary;

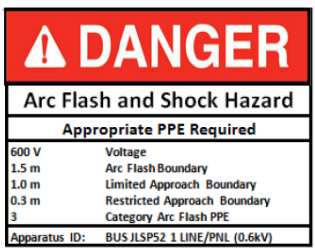
- Limited Approach Boundary;
- Restricted Approach Boundary; and
- Required category of arc flash PPE.

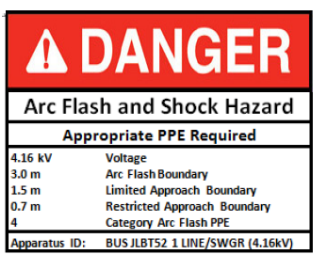
**Label Examples**

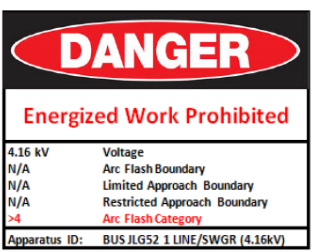


Arc Flash PPE

NTPC shall provide workers with the appropriate arc flash PPE. Arc flash protective flame resistant (FR) clothing (either Category 2 or Category 4, as required) shall be worn when working within the Arc Flash or Approach Boundaries to minimize the risk from arc flash hazards.

Workers exposed to arc flash hazards shall wear CSA-approved footwear with sole electric shock resistance (marked with a white rectangular CSA label containing an orange omega symbol (Ω)).

Arc flash clothing shall be Class 3 high-visibility apparel material (i.e., reflective stripes over the shoulders, around the waist, and encircling both arms and legs) and shall meet CSA Standard Z96: High Visibility Safety Apparel.

*Element 14.15: Arc Flash, Section 10 Arc Flash PPE*, *Table 1: Arc Flash PPE* identifies the arc flash PPE required to be worn in areas of the various arc flash hazards.

**See SWP *4.03: Arc Flash PPE,***
***Element 14.15: Arc Flash***

## 813 Asbestos Management

The purpose of *Element 14.16: Asbestos Management* is to ensure appropriate asbestos risk management for all NTPC employees. Asbestos risk is managed through training, education, and clear designation of areas with asbestos exposure risk, monitoring, and abatement.

This element identifies appropriate procedures for the management of asbestos containing materials (ACM) in the workplace. It applies to all NTPC workers exposed to asbestos hazards and includes the requirements for:

- Asbestos Inspections
- Asbestos Inventory
- Labelling of Asbestos Containing Materials
- Notification Procedures
- Asbestos Containing Materials in Service
- Asbestos Fibre Release
- Asbestos Abatement Projects
- Medical Examinations
- Training
- Documentation

**See *Element 14.16: Asbestos Management***

## 814 Return to Work

Where a worker has suffered a work-related injury, it is beneficial to both the injured worker and the Northwest Territories Power Corporation (NTPC) that the worker returns to meaningful employment as soon as possible.

The purpose of *Element 14.14: Return to Work* is to define NTPC's Return-to-Work program as part of the Health & Safety Management System.

NTPC may grant restricted work (i.e., modified duties) to an injured worker in order to provide a structured and organized employment during the recovery period required to return the worker to their pre-injury employment duties.

This element defines the requirements of the Return-to-Work program as part of the NTPC Health & Safety Management System.

***See Element 14.14: Return to Work***

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# SECTION 9: WORK PROTECTION CODE

## NOTES

## 1. Purpose

The Northwest Territories Power Corporation (NTPC) is committed to safeguarding workers and equipment by instituting and maintaining a Work Protection Code (WPC). The WPC is designed to protect workers from various forms of hazardous energy while conducting work on specified apparatus.

## 2. Scope

It is recognized that work must be performed on apparatus that presents safety hazards and/or jeopardizes system security. The Work Protection Code applies to all workers conducting work on apparatus associated with NTPC generation, transmission, and distribution facilities.

## 3. Definitions

Refer to section 10 of this book for the glossary.

## 4. References

- NWT Safety Act 1988
- NTPC Emergency Response Plan

# 5. General Responsibilities

## 5.1. NTPC

NTPC is responsible to:

- Ensure a process is in place to develop and implement the Work Protection Code (WPC).
- Ensure the resources, time, money, and technology are available to support the WPC.
- Ensure training is provided to workers in the use of the WPC.
- Ensure the performance of management and workers is measured relative to the WPC.

## 5.2. Management

Management is responsible to:

- Ensure development, implementation, use, and evaluation of the WPC.
- Ensure provision of WPC training to workers.
- Ensure that only authorized workers carry out all WPC work.
- Monitor the application and use of the WPC.
- Take corrective action and use performance management when the WPC is not followed.
- Measure the performance of workers relative to the WPC.

## 5.3. Workers

Workers are responsible to:

- Participate and receive training in the use of the WPC.
- Know and comply with the WPC.
- Participate in the development and

improvement of the WPC as required.

### 5.4. Health & Safety Department

The Health & Safety Department is responsible to:

- Provide advice and assistance in the development and implementation of the WPC.
- Provide interpretation of generalized work processes, industry best practice, manufacturer recommendations, and legislation for the development of the WPC.
- Assist with training workers in the use of the WPC as required.
- Monitor the application and use of the WPC.

# 6. Specific Responsibilities

## 6.1. Work Protection Code Managers

The Work Protection Code (WPC) Managers are responsible to:

- Ensure new employees and contractors are informed during orientation that a WPC exists and that work can only be done on specific apparatus by authorized workers.
- Ensure workers are competent in the use of the WPC before declaring them WPC authorized workers.
- Ensure workers who successfully complete the WPC training are added to the *Authorized Work Protection List*.
- Ensure workers are formally retrained in the WPC as per the Health, Safety & Environment Training Matrix.
- Ensure revisions to the WPC are communicated to WPC authorized workers and included in the training program.
- Ensure the *Authorized Work Protection List* is readily available to each Issuing Authority.
- Establish the following:
    - Permit zones by identifying the Issuing Authority controls and interface points/devices.
    - Isolation or separation points between generation, transmission, and distribution for Work Permits, Work & Test Permits, and Hold-Off Permits.

- Use *Form 14.03.7: Permit Issuer Guide* to document this.

### 6.2. Permit Applicant

The Permit Applicant is responsible to:

- Share with the Issuing Authority the responsibility for the complete fulfillment of the WPC.
- Follow the policies and procedures for the administration of the WPC.
- Provide the Issuing Authority with all required information on the application.
- Arrange with the Issuing Authority to establish a means of communication for processing the application.
- Whenever possible, submit applications to provide adequate time for processing by the Issuing Authority.
- Appeal to WPC Managers when the Issuing Authority refuses to process an application.

### 6.3. System Issuing Authority

The System Issuing Authority (i.e., the System Control Operator) is responsible to:

- Issue and accept the surrender of permits pertaining to the Electrical System (i.e., all transmission lines and associated substations), in accordance with the WPC.
- **Assess Electrical System security** before Work Protection permits related to the Electrical System are issued and ensure that service will not be unnecessarily disrupted.

- Ensure the observance of the WPC and report non-conformance with the WPC to the appropriate WPC Manager.
- Share with the Permit Applicant, Permit Holder, and Switch Person the responsibility for the complete fulfillment of the WPC.
- Follow the policies and procedures for administration of the WPC.
- Approve the removal of apparatus from service or the placing of apparatus in service under the WPC.
- Assist in the preparation and checking of *Switching Plans*.
- Give final approval of all *Switching Plans* pertaining to the Electrical System.
- Conduct switching for removal from service and return to service as required.
- Ensure all workers who take part in the preparation, issuance, or surrender of permits pertaining to the Electrical System are already listed on the *Authorized Work Protection List*.
- Consult the System Control Manager when there is any uncertainty as to whether or not a permit should be granted. If a disagreement should occur that cannot be resolved, the permit shall not be issued and the work shall not proceed. The disagreement shall be referred to a WPC Manager for resolution.
- Work with the Permit Holder to establish communication requirements (i.e., mode and

frequency of communication) while the permit is in effect.

- Ensure that during voice communication (i.e., phone, radio):
  - Both the System Control Operator and the Permit Holder identify themselves by name and position before any instructions are given.
  - All instructions are repeated in full by the recipient.
- Ensure that for after-hours trouble calls on non-remotely controlled distribution apparatus:
  - An authorized worker shall be contacted to respond to the call.
  - If an authorized worker is not available, the manager on call shall be contacted.
- File all Work Protection documentation appropriately.

### 6.4. Local Issuing Authority

The Local Issuing Authority is responsible to:

- Issue and accept the surrender of permits, in accordance with the WPC.
- **Assess local system security** before issuing Work Protection permits.
- Obtain permission from the System Issuing Authority prior to issuing permits on apparatus connected to the Electrical System.
- Ensure the observance of the WPC and report non-conformance with the WPC to the

appropriate WPC Manager.

- Share with the Permit Applicant, Permit Holder, and Switch Person the responsibility for the complete fulfillment of the WPC.
- Follow the policies and procedures for administration of the WPC.
- Approve the removal of apparatus from service or the placing of apparatus in service under the WPC.
- Assist in the preparation and checking of *Switching Plans*.
- Give final approval of all *Switching Plans*.
- Direct the switching for removal from service and return to service as required.
- Ensure all workers who take part in the preparation, issuance, or surrender of permits are already listed on the *Authorized Work Protection List*.
- Consult the WPC Manager when there is any uncertainty as to whether or not a permit should be granted. If a disagreement should occur that cannot be resolved, the permit shall not be issued and the work shall not proceed. The disagreement shall be referred to a WPC Manager for resolution.
- Work with the Permit Holder to establish communication requirements (i.e., mode and frequency of communication) while the permit is in effect.
- Ensure that during voice communication (i.e., phone, radio):

- Both the Local Issuing Authority and the Permit Holder identify themselves by name and position before any instructions are given.
- All instructions are repeated in full by the recipient.

- Submit all required permit documentation to the System Issuing Authority.

### 6.5. Switch Person

The Switch Person is responsible to:

- Follow the policies and procedures for administration of the WPC.
- The System Issuing Authority may act as a Switch Person for the Local Issuing Authority (e.g., placement of a SCADA tag on a start/stop switch).
- The Local Issuing Authority may act as a Switch Person for the System Issuing Authority (e.g., operation of local/remote switch).
- Carefully consider and carry out instructions received from the Issuing Authority.
- Check the *Switching Plan* and ensure the switching sequences are correct.
- If a disagreement should occur that cannot be resolved, the work shall not proceed. The disagreement shall be referred to a WPC Manager for resolution.
- Ensure that all isolating and de-energizing devices have been switched correctly according to the directions given by the

Issuing Authority.

- Ensure that during voice communication (i.e., phone, radio):
  - Both the Issuing Authority and the Permit Holder identify themselves by name and position before any instructions are given.
  - All instructions are repeated in full by the recipient.

### 6.6. Permit Holder

The Permit Holder is responsible to:

- Be authorized to hold Work Protection permits.
- Share with the Issuing Authority and Switch Person the responsibility for the complete fulfillment of the WPC.
- Share with anyone else working under the permit the responsibility for the safety of all workers covered by the permit.
- Follow the policies and procedures for administration of the WPC.
- Assist in and ensure the completion of the *Switching Plan*.
- Ensure that during voice communication (i.e., phone, radio):
  - Both the System/Local Issuing Authority and the Permit Holder identify themselves by name and position before any instructions are given.
  - All instructions are repeated in full by the recipient.
- If a disagreement should occur that cannot

be resolved, the work shall not proceed. The disagreement shall be referred to a WPC Manager for resolution.

- Work with the Issuing Authority to establish communication requirements (i.e., mode and frequency of communication) while the permit is in effect.
- Maintain a means of communication with the Issuing Authority as per the established communication requirements.
- Ensure the safety of all workers working under the protection of the permit.
- Be at the work area of the specified apparatus while the permit is in effect and the work is continuing. If the Permit Holder must leave the work area, work under the permit shall stop or the permit shall be transferred.
- Take out no more permits than can be safely managed.
- Document the location of working grounds on the *Switching Plan*.
- Ensure only workers authorized by the Permit Holder work under the protection of the permit.
- Instruct the workers working under the permit regarding:
  - The specified apparatus on which work is authorized.
  - The isolating and/or de-energizing devices, including working grounds used to create an electrically safe zone (if required), for the specified apparatus to be worked on.

- The neighbouring apparatus that are alive and dangerous.
- The safeguards provided against neighbouring alive apparatus and the precautions necessary when working near such apparatus.
- The requirement to provide all documentation to the Issuing Authority at the time of surrender.

- For after-hours trouble calls:
  - Ensure communication is established with the Issuing Authority to facilitate the appropriate response prior to starting work.
  - In the event that the Local Issuing Authority is required but unavailable, the Permit Holder shall contact the System Issuing Authority.

# 7. Permit Procedure

## 7.1. General

7.1.1. All Work Protection Code (WPC) permits shall be self-sustaining (i.e., affording their own protection and not depending on the apparent protection of some other permit).

7.1.2. All permits issued shall have their own unique number.

7.1.3. Under no circumstances shall any permit be deemed to protect anyone who is not authorized by the Permit Holder to work under the protection of the permit.

7.1.4. Permits shall become effective at the moment of issuance and shall cease at the moment of surrender.

7.1.5. The Issuing Authority shall ensure the issuance, cancellation, transfer, and surrender of permits is recorded in the Work Protection Log.

7.1.6. Permit communications shall be accepted electronically, by fax, or on paper as well as verbally in some situations.

7.1.7. Emails shall be considered equivalent to signature acceptance and shall be noted on the permit.

7.1.8. Issuance and surrender can be completed by phone; however Permit applications and completed permits shall be faxed or emailed between the Permit Holder and the Issuing Authority for documentation purposes.

7.1.9. Should the situation arise that no means of communication are available, local communication shall be established at the work site before work is commenced. Work shall follow NTPC procedures and standards to ensure worker safety.

7.1.10. Workers shall have the permission of the Permit Holder to work under a permit.

7.1.11. All workers working under the permit shall be listed in the Comments section of the permit.

7.1.12. Any worker working under a permit shall place their personal locks on either the isolation points or the lock box. Personal locks shall be tagged with the appropriate permit tag which shall contain the permit number, name of lock owner, and date.

**7.2. Switching During Emergency**

7.2.1. During an emergency (as declared by NTPC) all workers shall act according to:

- The NTPC Emergency Response Plan;
- The Hazard Assessment and Control program; and
- All Safe Work Practices and Safe Job Procedures.

7.2.2. During emergency conditions, where communications with the Issuing Authority are unavailable, Qualified Workers may perform, without a permit, a switching operation that they understand. Under no

circumstances shall workers perform any switching that they do not understand.

7.2.3. All actions taken by a worker during an emergency shall be promptly reported to their manager and the Issuing Authority.

7.2.4. As soon as the emergency is under control the appropriate permit forms and Switching Plans shall be completed and submitted to the Issuing Authority.

### 7.3. Application

7.3.1. There are three Work Protection permit forms:

- Form 14.03.1: Work Permit
- Form 14.03.2: Work & Test Permit
- Form 14.03.3: Hold-Off Permit

7.3.2. Permit forms are divided into the following sections:

- Work Details
- Communication
- Issuance
- Transfer
- Surrender
- Permit Switching Completion
- Comments

7.3.3. To apply for a permit the Permit Applicant shall:

- Complete the Work Details section of the applicable permit;
- Complete as much of the Communication section as possible; and

- Submit the permit form to the Issuing Authority.

7.3.4. Permit applications shall be submitted in writing to the appropriate Issuing Authority, except in situations requiring a verbal application.

7.3.5. In the case of a verbal application the Issuing Authority shall complete the application form.

7.3.6. Job planning shall allow permit requests to be made in advance of the work to allow sufficient time to process the application.

**7.4. Processing**

7.4.1. The Issuing Authority shall assign a permit number (refer to section 7.9).

7.4.2. The Issuing Authority shall record the permit information in the Work Protection Log.

7.4.3. The Issuing Authority shall evaluate the permit application and consider:

- Whether there is sufficient information on the application to safely proceed with the processing of the permit and ensuing work;
- The effect of the work on system security and continuity of supply to customers;
- Any other permits or applications that could impact the application.

7.4.4. The Local Issuing Authority shall obtain permission from the System Issuing Authority prior to issuing permits on

apparatus connected to the Electrical System (i.e., Yellowknife/Bluefish/Snare system and the Fort Smith/Taltson system). The process is as follows:

- The Local Issuing Authority shall complete Form 14.03.11: Electrical System Security and submit it to the System Issuing Authority.
    - Job planning shall allow requests to be made in advance of the work to allow sufficient time for review, coordination, and approval of requests.
- The System Issuing Authority shall:
    - Assess Electrical System security and verify that service will not be unnecessarily disrupted.
    - Complete the Approval section of the form and return it to the Local Issuing Authority.
- The Local Issuing Authority shall contact the System Issuing Authority prior to the issuance of Work Protection and verify that no change in status has occurred.
- The System Issuing Authority may cancel approval at any time to preserve Electrical System Security.

7.4.5. The Issuing Authority may request additional information before processing a permit application for the following reasons:

- Insufficient information provided in the application;

- The application fails to conform to the WPC; and/or
- Undesirable operating conditions would result from the work.

7.4.6. A completed Switching Plan shall be attached to the application. The Switching Plan shall outline the steps required to take the apparatus from service and to return the apparatus to service (refer to section 8).

7.4.7. It is permissible to have a common isolating device between permits; however the device shall not be operated while any other permit that shares the device is in effect.

7.4.8. For processing permits on system inter-utility tie lines (i.e., Northland Utilities) all requirements and guarantees of the NTPC Work Protection Code are applicable, but cover only NTPC's scope of authority.

7.4.9. The Issuing Authority shall provide the permit number to the Permit Holder and provide permission to commence switching, locking, and tagging.

**7.5. Making Effective**

7.5.1. The Issuing Authority shall ensure the required switching is completed.

7.5.2. The Issuing Authority shall then:

- Sign the Issuance section of the form;
- Record the date and time on the form and in the Work Protection Log; and
- Notify the Permit Holder that the permit is now in effect using the wording in

the Issuance section of the permit (e.g., “This Work Permit is the authority to work on the apparatus described and applies to this apparatus only. It is a guarantee that Work Protection is in effect and the apparatus is safe to work on.”).

**7.6. Permit Transfer**

7.6.1. If work must continue under the permit but the Permit Holder is not available, a Permit Transfer shall be completed.

7.6.2. An authorized worker shall take over the permit provided they receive a full explanation of all details regarding the status of the specified apparatus, the permit zone, and the protection of the permit.

7.6.3. A permit shall not be transferred if the Permit Holder is not available (refer to section 7.8.5).

7.6.4. To complete a permit transfer the following steps shall be taken:

- The Permit Holder shall notify the Issuing Authority that a permit transfer is required.
- The Issuing Authority shall provide the permit to the Permit Holder.
- The Permit Holder shall complete the Transfer section of the permit indicating the reason for transfer, the name of the new Permit Holder, and any changes in communication methods. Both the existing Permit

Holder and the new Permit Holder shall sign the permit.

- All work under the permit shall stop.
- The permit shall be provided to the Issuing Authority.
- The Issuing Authority shall sign the Transfer section and notify the new Permit Holder that the permit is now in their name.
- The new Permit Holder shall physically verify, or have the Switch Person physically verify, all lock-out points prior to starting work.
- The Switch Person, authorized by the Issuing Authority, shall remove all old tags and attach new tags to all lock-out points prior to starting work.
- Work under the permit may then recommence.
- If additional permit transfers are required, they shall be documented in the same manner on Form 14.03.12: Permit Transfer.
- In the event that only verbal communications are available:
    - The Issuing Authority, existing Permit Holder, and new Permit Holder shall authorize the permit transfer verbally; and
    - The Issuing Authority shall record the first permit transfer in the Transfer section of the permit, and

any additional permit transfers on Form 14.03.12: Permit Transfer.

**7.7. Expanding/Collapsing a Permit**

7.7.1. A permit may require expanding or collapsing due to:
- A change in the size of the work zone;
- A change of location; and/or
- Addition or surrender of isolating/de-energizing devices.

7.7.2. The Permit Holder shall request permission in writing or verbally from the Issuing Authority to expand or collapse a permit.

7.7.3. The Issuing Authority shall record the reasons for the expanding or collapsing in the Comments section of the permit.

7.7.4. The Issuing Authority shall record the changes on the initial Switching Plan.

7.7.5. A new Switching Plan shall then be completed by the Permit Holder and authorized by the Issuing Authority.

7.7.6. Before switching changes begin, the Issuing Authority shall direct the Permit Holder to have all workers clear of the apparatus.

7.7.7. The Issuing Authority shall direct the expanding/collapsing of the permit by directing the switching.

7.7.8. Once switching changes are complete the Issuing Authority shall inform the Permit Holder that the changes have been completed and shall provide a copy of the permit to the Permit Holder.

7.7.9. Work can then resume.

**7.8. Surrender**

7.8.1. The Permit Holder shall surrender the permit to the Issuing Authority.

7.8.2. Before surrendering the permit the Permit Holder shall:

- Inspect the apparatus covered by the permit;
- Ensure the apparatus is in a safe condition for surrender;
- Inform all workers under the permit that the permit is going to be surrendered; and
- Ensure that all workers are clear of the apparatus.

7.8.3. To surrender a permit the Permit Holder shall:

- Notify the Issuing Authority that they wish to surrender the permit;
- Sign the Surrender section of the permit and record the date and time. If the Permit Holder is not present to sign the permit, the Issuing Authority shall indicate this in the Permit Holder signature block and initial it;
- Submit all documentation to the Issuing Authority.

7.8.4. The Issuing Authority shall verify to the Permit Holder that the permit has been surrendered using the wording in the Surrender section of the permit (e.g., “All

workers are clear of the above apparatus and the permit is hereby surrendered.").

7.8.5. If surrender of a permit is required and the Permit Holder is not available, the permit may be surrendered by a WPC Manager. Using Form 14.03.5: Surrender when Permit Holder is not Available the designated manager shall:

- Make a minimum of two attempts to contact the Permit Holder;
- Obtain signature approval from the Director;
- Confirm that all workers are clear of the permit zone;
- Confirm that all apparatus is in a safe condition;
- Inform the Permit Holder at the earliest opportunity that the permit has been surrendered; and
- Complete the Permit Holder Notification section of the form.

7.8.6. In the case of an emergency the Issuing Authority may request the immediate surrender of permits. Before immediate surrender of any permit all apparatus shall be in a safe condition.

**7.9. Permit Switching Completion**

7.9.1. Once the permit is surrendered by the Permit Holder, the Issuing Authority shall:

- Determine whether or not to place the apparatus back into service;
- Contact the Switch Person before

return switching starts; and
- Direct the return switching accordingly.

7.9.2. The Issuing Authority shall direct the return switching in accordance with the Return to Service Switching Plan:
- If returning the apparatus to service, confirm that all tags and locks that were placed for the permit have been removed and noted on the Switching Plan.
    - If not returning the apparatus to service:
    - Record the status of locks on the Switching Plan (i.e., removed or in place);
    - Confirm that all tags that were placed for the permit have been removed and noted on the Switching Plan; and
    - Ensure Special Instructions tags are placed on any locks that remain in place.

7.9.3. The Issuing Authority shall then:
- Sign the Permit Switching Completion section of the permit and record the date and time; and
- File the permit with all accompanying documentation (i.e., Switching Plans, Permit Transfer forms, Lock Removal Authorization forms, Surrender when Permit Holder is not Available forms, and any emails pertaining to the permit) as per section 7.11.

## 7.10. Permit Numbers

7.10.1. Permit numbers shall be:

- Assigned by the Issuing Authority and provided to the Permit Holder.
- Unique and sequential.
- Numbered by calendar year, plant, and permit number (e.g., 2014-YK-001, 2014-YK-002, 2014-YK-003).
- Recorded by the Issuing Authority in the Work Protection Log.

7.10.2. Plant abbreviations, for the purpose of permit number generation, are as follows:

| | | | |
|---|---|---|---|
| AK | Aklavik | NB | Nahanni Butte |
| BH | Bluefish Hydro | NW | Norman Wells |
| BJ | Buffalo Jct. | PL | Paulatuk |
| CL | Colville Lake | PP | Pine Point Sub |
| DL | Deline | SH | Sachs Harbour |
| DS | Dettah Sub | SC | Snare Cascades |
| FG | Ft. Good Hope | SF | Snare Falls |
| FL | Fort Liard | SK | Snare Forks |
| FP | Ft. McPherson | SR | Snare Rapids |
| FR | Ft. Resolution | ST | Snare Tie Sub |
| SM | Ft. Simpson | TG | Taltson Hydro |
| FS | Ft. Smith | TC | Tsiigehtchic |
| FC | Frank Channel | TK | Tuktoyaktuk |
| GM | Gameti | TL | Tulita |
| IT | Ingraham Sub | UH | Ulukhaktok |
| NK | Inuvik | WT | Whati |
| JF | Jackfish (local) | WG | Wrigley |
| JM | Jean Marie | YK | Yellowknife (sys) |
| LK | Lutsel K'e | - | - |

## 7.11. Records & Documentation

7.11.1. A Work Protection Log book shall be maintained in every plant by the Local Issuing Authority (i.e., Plant Superintendent/Operator).

7.11.2. An electronic Master Work Protection Log (Form 14.03.9: Work Protection Log) shall be maintained in the System Control Room by the System Issuing Authority. All permits shall be logged here, including those issued by Local issuing Authorities.

7.11.3. The completion of the Work Protection Log is the responsibility of the Issuing Authority.

7.11.4. The following information shall be recorded in the Work Protection Log:

- Permit number.
- Permit Holder.
- Permit location.
- Issuing Authority name.
- Date & time of issue.
- Date & time of surrender.
- Transfer date & time.
- New Permit Holder.
- Comments.

7.11.5. A Work Protection Documentation iManage workspace shall be maintained by calendar year for the filing of Work Protection documentation. The workspace shall be structured as follows:

- Divided into two tabs: Hydro Division and Thermal Division.
- Folders shall be maintained under

each tab for all work locations (i.e., plants and substations).

- A new folder shall be created by the System Issuing Authority under the applicable work location for each permit and shall be named by calendar year, location, and permit number (e.g., 2014-YK-001).

7.11.6. The Permit Holder shall submit the surrendered permit and all accompanying documentation (i.e., Switching Plans, Permit Transfer forms, Lock Removal Authorization forms, Surrender when Permit Holder is not Available forms, and any emails pertaining to the permit) to the Issuing Authority.

7.11.7. After Permit Switching Completion the Issuing Authority shall submit the surrendered permit and all accompanying documentation to the System Issuing Authority by.

- Emailing it to permits@ntpc.com (preferred); or
- Faxing it to 1-888-442-6042.

7.11.8. The System Issuing Authority shall file the surrendered permit and accompanying documentation in the appropriate location in iManage.

7.11.9. After Permit Switching Completion, submission of documentation to the System Issuing Authority, and filing of documentation by the System Issuing

Authority, original Work Protection documentation is no longer required.

7.11.10. At the end of each calendar year each Local Issuing Authority shall email or fax their Work Protection Log to the System Issuing Authority.

- The System Issuing Authority shall name each Work Protection Log by calendar year, location, and title (e.g., 2014-YK-WP Log) and file them in iManage.
- The System Issuing Authority shall compare each Local Work Protection Log to the Master Protection Log and the permits filed in iManage to ensure all permits have been properly documented and filed.

# 8. Switching Plan

## 8.1. General Requirements

8.1.1. Switching Plans shall be used in conjunction with Work Protection permits to ensure worker safety, equipment safety, and system security.

8.1.2. A Switching Plan shall be in place for every permit.

8.1.3. All locks and tags shall be documented on the Switching Plan:

- Note in the Lock & Tag column whether there is a lock and/or tag.
- Note the type of tag in the Comments column.

8.1.4. Placement of a SCADA tag shall be recorded on the Switching Plan but does not constitute isolation.

8.1.5. Switching Plans shall be documented on Form 14.03.4: Switching Plan.

8.1.6. Each Switching Plan shall be divided into two step-by-step switching procedures:

- Remove from Service
- Return to Service

8.1.7. The Switching Plan shall include:

- Detailed Remove from Service switching procedure including:
  - Clear identification of any isolating and/or de-energizing devices requiring a change of state.
  - Clear identification of any operable devices.

- Detailed Return to Service switching procedure including:
  - Clear identification of any isolating and/or de-energizing devices requiring a change of state.
  - Clear identification of any operable devices.

8.1.8. The Switching Plan shall be prepared by an authorized worker, verified by a second authorized worker, and submitted to the Issuing Authority with the Permit Application.

8.1.9. The Issuing Authority shall:

- Verify and confirm all steps on the Switching Plan,
- Authorize the Switching Plan with a signature, the date, and the time; and
- Return the Switching Plan with the permit to the Permit Holder at the time of issue.

**8.2. Transmission & Distribution Switching**

8.2.1. The following statements apply for Transmission & Distribution work, which has unique operating conditions:

8.2.2. Each Switching Plan shall be divided into two Change of State switching procedures:

- Removal from Service
  - Dynamically Alive to Separated State.
  - Separated to Isolated State.
  - Isolated to De-energized State.
- Return to Service

- De-energized to Isolated State.
- Isolated to Separated State.
- Separated to Dynamically Alive State.

8.2.3. Switching steps shall be followed in the sequence identified on the Switching Plan unless otherwise directed by the Issuing Authority.

8.2.4. For manual step-by-step switching operations on Transmission and Distribution remotely controlled apparatus:

- Auto-reclose blocking and tagging of breakers is required if a switching error or apparatus failure could cause a fault on the Electrical System or Distribution System. Blocking and tagging steps shall be:
  - Directed and controlled by the Issuing Authority; and
  - Documented on the Remove from Service and Return to Service sections of the Switching Plan.
- Auto-reclose blocking and tagging of breakers is not required where lock-out protection is provided (i.e., 86 relay, which cannot be reset remotely).

# 9. Work Permit

## 9.1. Description

9.1.1. A Work Permit is a guarantee of isolation for specific work on specific apparatus.

9.1.2. If a Work Permit requires grounding, it shall be issued in the de-energized state.

## 9.2. General Requirements

9.2.1. It is permissible to issue more than one Work Permit on specified apparatus.

9.2.2. No Work Permit shall be issued in a permit zone covered by a Work & Test Permit.

9.2.3. Multiple workers are permitted to work under a Work Permit (see section 13.1.8).

9.2.4. The specified apparatus shall be isolated and/or de-energized before the Work Permit is issued.

9.2.5. The guarantee of isolation and/or de-energization for the specified apparatus shall remain in effect until the Work Permit has been surrendered.

## 9.3. Work Permit Hold/Operate Parameters

9.3.1. Under a Work Permit it is permissible to operate or make dynamically alive specified apparatus for the purpose of controlled movements (linear or rotation) for maintenance or inspection within the permit zone, provided the Permit Holder and Issuing Authority agree this action cannot jeopardize the guarantee of de-energization provided to any other Permit Holder.

9.3.2. This controlled movement shall be done in accordance with the Safe Job Procedure or Job Safety Analysis, which shall be reviewed by the Issuing Authority and Permit Holder prior to the action taking place.

9.3.3. Specified de-energizing devices and/or isolating devices that may need to be operated for the purposes of this section shall be locked and tagged with a Work Permit Hold/Operate Tag (refer to section 9.11).

9.3.4. All workers who will be affected by the operation of the specified apparatus shall apply a personal lock and/or shall follow the Lockbox Procedure.

**9.4. Application**

9.4.1. Work Permit requests shall be made using Form 14.03.1: Work Permit.

9.4.2. All Work Permits require a Switching Plan.

9.4.3. In an emergency situation, or in a situation where communications prevent a written application from being submitted, a Work Permit may be requested verbally:

- If a verbal request is made and deemed acceptable by the Issuing Authority, the Issuing Authority shall complete the appropriate forms while in communication with the Permit Holder.
- As soon as feasible following surrender of the permit the Permit

Holder shall sign the Work Permit, attach all Switching Plans, and submit it to the Issuing Authority.

**9.5. Processing**

9.5.1. Refer to section 7.4.

**9.6. Making Effective**

9.6.1. Refer to section 7.5.

9.6.2. The Issuing Authority shall establish communication with all Switch Persons.

9.6.3. The Issuing Authority shall request the switching be completed by the Switch Person as per the Switching Plan:

- The Switch Person shall follow the Switching Plan, applying the appropriate locks and tags as required, and noting the times of each step on the form.
- The Permit Holder (i.e., Local Issuing Authority) shall accompany the Switch Person during isolation, where feasible. Where not feasible, verbal confirmation shall take place between the Switch Person and the Permit Holder and shall be noted by the Issuing Authority on the permit.
- Any grounding apparatus placed shall be noted as a step on the Switching Plan and a Work Permit Grounded Tag shall be placed (refer to section 9.12).
- Grounding apparatus location, time placed, and by whom shall be

recorded on the Switching Plan.

- There are three different types of *Work Permit* tags:
  - Work Permit Hold tag (see section 9.10)
  - Work Permit Hold/Operate tag (see section 9.11)
  - Work Permit Grounded tag (see section 9.12)
- One or more types of Work Permit tags may be used, depending on the work.

9.6.4. When the isolation has been completed the Switch Person shall submit the completed Switching Plan form to the Issuing Authority.

9.6.5. The Issuing Authority shall issue the Work Permit to the Permit Holder.

**9.7. While Permit is in Effect**

9.7.1. The Permit Holder shall be at the work area of the specified apparatus while the Work Permit is in effect and the work is continuing.

9.7.2. If the Permit Holder must leave the work area of the specified apparatus and work is to continue the Work Permit shall be transferred.

9.7.3. If the Permit Holder must leave the work area of the specified apparatus briefly (e.g., for a communication check), the specified work shall stop during the Permit Holder's absence.

9.7.4. While the Work Permit is in effect the Permit Holder shall:

- Instruct all workers working under the permit that the permit is in effect.
- Review the points of protection with all workers through a documented Tailboard Meeting.
- Ensure the work is conducted in a safe manner following the appropriate work procedures.

**9.8. Surrender**

9.8.1. The Permit Holder shall surrender the Work Permit as per section 7.8.

**9.9. Permit Switching Completion**

9.9.1. The Issuing Authority shall carry out Permit Switching Completion as per section 7.9.

## 9.10. Work Permit Hold Tags

9.10.1. Work Permit Hold Tags are red (see below):



9.10.2. Work Permit Hold Tags indicate that a device shall be kept in a specified position. They include the statement “Danger, do not operate.”

9.10.3. The following devices shall be tagged with Work Permit Hold Tags:

- Isolating and mechanical de-energizing devices that have guaranteed positions (e.g., valves, breakers); and
- All control devices and/or indicators of isolating devices at all locations (e.g.,

SCADA tags).

9.10.4. When devices will be operated Work Permit Hold/Operate Tags shall be placed as per section 9.11.

9.10.5. When using grounds Work Permit Grounded Tags shall be placed as per section 9.12.

## 9.11. Work Permit Hold/Operate Tags

9.11.1. Work Permit Hold/Operate Tags are half red and half white (see below):


9.11.2. Work Permit Hold/Operate Tags indicate that a device shall be kept in a specified position; however specific movement/operation of the apparatus/device is allowed under specific conditions. They include the statement "Operate only at request of Permit Holder."

9.11.3. The following devices shall be tagged with Work Permit Hold/Operate Tags:

9.11.4. Isolating and mechanical de-energizing devices that need to be operated (e.g., valves, stroking wicket gates, rotating an engine); and
- All control devices or indicators of mechanical isolating or de-energizing devices that need to be operated (e.g., SCADA tags).

9.11.5. When a device is being operated the tag shall remain in place.

**9.12. Work Permit Grounded Tags**

9.12.1. Work Permit Grounded Tags are white with a red border (see below):

9.12.2. Work Permit Grounded Tags indicate that a device is grounded.

9.12.3. The following devices shall be tagged with Work Permit Grounded Tags:
- All electrical de-energizing devices (system/working grounds);
- All control devices or indicators of isolating devices at all locations. If these locations are not available tags shall be placed in other appropriate conspicuous locations to indicate the apparatus covered is grounded;
- If a ground is placed behind a closed door, a tag shall be placed on the outside of the door as well as on the physical grounds; and
- If the grounds are in a separate/remote location, tags shall be placed at the isolation devices.


WORK
PERMIT
GROUNDED
Permit # _____
Apparatus # _____
Date _____
Permit Holder _____


DANGER
SEE REVERSE
NORTHWEST TERRITORIES
POWER
CORPORATION
Empowering Communities

# 10. Work & Test Permit

## 10.1. Description

10.1.1. A Work & Test Permit is a guarantee of de-energization when issued under which specific work and tests are done on specific apparatus.

## 10.2. General Requirements

10.2.1. Under a Work & Test Permit it is permissible to change the status of isolating and/or de-energizing devices (i.e., operable devices) to make the apparatus alive for testing purposes. This requires a written procedure to ensure the testing is safe and the system secure.

10.2.2. The Work & Test Permit does not guarantee an Electrically Safe Zone until all electrically charged energy has been controlled.

10.2.3. Conditions may exist that prevent specified mechanical apparatus from being completely de-energized from charged energy. For these situations an approved apparatus-specific procedure shall be used.

10.2.4. Certain apparatus cannot be de-energized from dynamic energy (e.g., battery systems). For these situations an approved apparatus-specific procedure shall be used.

10.2.5. The specified apparatus shall be isolated and/or de-energized from every source of dynamic energy before the Work & Test Permit is issued.

10.2.6. Only one Work & Test Permit shall be in effect at a time within a permit zone.

10.2.7. No other permit shall be issued on specified apparatus within a permit zone covered by a Work & Test Permit.

10.2.8. When testing is complete and further work is to be performed the specified apparatus shall be returned to the de-energized state.

10.2.9. When all Work & Test activities are complete the Work & Test Permit shall be surrendered.

**10.3. Application**

10.3.1. Work & Test Permit requests shall be made using Form 14.03.2: Work & Test Permit.

10.3.2. All Work & Test Permits require a Switching Plan.

10.3.3. In an emergency situation, or in a situation where communications prevent a written application from being submitted, a Work & Test Permit may be requested verbally.

- If a verbal request is made and deemed acceptable by the Issuing Authority, the Issuing Authority shall complete the appropriate forms while in communication with the Permit Holder.
- As soon as feasible following completion of the work, the Permit Holder shall sign the Work & Test Permit, attach all Switching Plans, and submit it to the Issuing Authority.

**10.4. Processing**

10.4.1. Refer to section 7.4.

**10.5. Making Effective**

10.5.1. Refer to section 7.5.

10.5.2. The Issuing Authority shall establish communication with all Switch Persons.

10.5.3. The Issuing Authority shall request the switching be completed by the Switch Person as per the Switching Plan:

- The Switch Person shall follow the Switching Plan, applying the appropriate locks and tags as required, and noting the times of each step on the form.
- The Permit Holder (i.e., Local Issuing Authority) shall accompany the Switch Person during isolation, where feasible. Where not feasible, verbal confirmation shall take place between the Switch Person and the Permit Holder and shall be noted by the Issuing Authority on the permit.
- Any grounding apparatus placed shall be noted as a step on the Switching Plan and a Work & Test Permit Grounded Tag shall be placed.
- Grounding apparatus location, time placed, and by whom shall be recorded on the Switching Plan.
- There are two different types of Work & Test Permit tags:

- Work & Test Permit Hold tag (see section 10.9)
- Work & Test Permit Grounded tag (see section 10.10)

- One or more types of Work & Test Permit tags may be used, depending on the work.

10.5.4. When the isolation has been completed the Switch Person shall submit the completed Switching Plan form to the Issuing Authority.

10.5.5. The Issuing Authority shall issue the Work & Test Permit to the Permit Holder.

**10.6. While Permit is in Effect**

10.6.1. The Permit Holder shall be at the work area of the specified apparatus while the Work & Test Permit is in effect and the work is continuing.

10.6.2. If the Permit Holder must leave the work area of the specified apparatus and work is to continue the Work & Test Permit shall be transferred.

10.6.3. If the Permit Holder must leave the work area of the specified apparatus briefly (e.g., for a communication check), the specified work shall stop during the Permit Holder's absence

10.6.4. While the Work & Test Permit is in effect the Permit Holder shall:

- Instruct all workers working under the permit that the permit is in effect.
- Review the points of protection with all

workers through a documented Tailboard Meeting.
- Ensure that the work is conducted in a safe manner following the appropriate work procedures.
- Inform all affected workers before the position of any isolating or de-energizing devices are changed.
- Complete the work and/or testing.

**10.7. Surrender**

10.7.1. The Permit Holder shall surrender the Work & Test Permit as per section 7.8.
- The Permit Holder shall confirm that any working grounds are removed.

**10.8. Permit Switching Completion**

10.8.1. The Issuing Authority shall carry out Permit Switching Completion as per section 7.9.

**10.9. Work & Test Permit Hold Tags**

10.9.1. Work & Test Permit Hold Tags are yellow (see below):


10.9.2. Work & Test Permit Tags indicate that a device has been de-energized prior to issuance of the permit and that there is a written procedure to make the apparatus alive for testing purposes. They include the statement “Hold. Operate only at request of Permit Holder.”

10.9.3. When a device is being operated for work or testing the tag shall remain in place.

10.9.4. The following devices shall be tagged with Work & Test Permit Hold Tags:

- All isolating and mechanical de-energizing devices that have guaranteed positions (e.g., valves,

breakers);

- All mechanical isolating and de-energizing devices that may be operated for work and tests (e.g., valves, breakers); and
- All control devices and/or indicators of isolating devices at all locations (e.g., SCADA tags).

10.9.5. When using grounds Work & Test Permit Grounded Tags shall be placed as per section 10.10.

## 10.10. Work & Test Permit Grounded Tags

10.10.1. Work & Test Permit Grounded Tags are white with a yellow border (see below):


10.10.2. Work & Test Permit Grounded Tags indicate that a device is grounded.

10.10.3. The following devices shall be tagged with Work & Test Permit Grounded Tags;

- All electrical de-energizing devices (system/working grounds);
- All control devices or indicators of isolating devices at all locations. If these locations are not available tags shall be placed in other appropriate

conspicuous locations to indicate the apparatus covered is grounded;

- If a ground is placed behind a closed door, a tag shall be placed on the outside of the door, as well as on the physical grounds; and
- If the grounds are in a separate/remote location, tags shall be placed at the isolation devices.

# 11. Hold-Off Permit

## 11.1. Description

11.1.1. A Hold-Off Permit is a guarantee of non-reclose for work on or near dynamically alive apparatus.

11.1.2. "Working on" means using insulated tools or Live Line Procedures to make direct contact with dynamically alive apparatus.

11.1.3. "Working near" means that an inadvertent movement could potentially cause accidental encroachment on the Limits of Approach by workers, tools, materials, or equipment.

11.1.4. A Hold-Off Permit is also required for manual switching operations on remotely controlled apparatus where failure of the switching apparatus could cause a fault on the Electrical System or Distribution System.

11.1.5. A Hold-Off Permit is not required for manual switching operations on remotely controlled apparatus where lock-out protection (86 relay) is provided.

11.1.6. A Hold-Off Permit provides system security.

11.1.7. A Hold-Off Permit provides no worker protection in the case of direct contact with dynamically alive apparatus.

## 11.2. General Requirements

11.2.1. A Hold-Off Permit ensures that in the event of the operation of the protective tripping

device an apparatus will not be made dynamically alive. This is done by ensuring:

- Relay protection on the protective tripping device is in service. If redundant relays are utilized at least one has to be in service.
- Auto-reclose features are switched off.
- Manual reclose is not allowed.
- All switching station power transfer controls have been disabled.

11.2.2. For Hold-Off Permits on non-remotely controlled distribution apparatus, the guarantee of non-reclose shall be provided at the nearest protective tripping device that has auto-reclose, whether or not it has non-reclose capability.

11.2.3. On non-remotely controlled distribution apparatus a Hold-Off Permit is not mandatory for switching operations. Switching operations are defined as:

- The operation of a switch.
- The operation of a cut-out (includes fusing).
- The operation of a disconnect.
- Installation and removal of a hot line clamp.
- Use of an insulated telescoping measuring stick.
- The operation of any other switching device.

11.2.4. The Issuing Authority shall ensure that day-to-day switching operations do not affect

any Work Protection permits in effect. All Switch Persons shall communicate with the Issuing Authority before performing any switching operation.

11.2.5. A Hold-Off Permit provides authorization for work on specified apparatus. It is permissible to use the same protective tripping device for more than one Hold-Off Permit on the same apparatus.

11.2.6. If more than one work group is working on the same device or apparatus, each work group shall obtain a separate Hold-Off Permit.

11.2.7. Under the Hold-Off Permit work may not be done on protection relays unless there are redundant relays and one is in service.

11.2.8. A Hold-Off Permit requires a satisfactory line of communication between the Issuing Authority and the Permit Holder to ensure the well-being of the worker and to monitor the status of the work.

11.2.9. A communication check between the Issuing Authority and Permit Holder shall take place from the worksite prior to work starting and at pre-arranged intervals thereafter.

**11.3. Application**

11.3.1. Hold-Off Permit requests shall be made using Form 14.03.3: Hold-Off Permit.

11.3.2. In an emergency situation, or in a situation where communications prevent a written

application from being submitted, a Hold-Off Permit may be requested verbally.

- If a verbal request is made and deemed acceptable by the Issuing Authority, the Issuing Authority shall complete the appropriate forms while in communication with the Permit Holder.
- As soon as feasible following completion of the work, the Permit Holder shall sign the Hold-Off Permit, attach all Switching Plans, and submit it to the Issuing Authority.

**11.4. Processing**

11.4.1. Refer to section 7.4.

**11.5. Making Effective**

11.5.1. Refer to section 7.5.

11.5.2. The Issuing Authority shall:

- Confirm the apparatus concerned has adequate protective features and devices in service.
- Confirm that all Switch Persons, if applicable, are in the correct locations.
- Direct the Switch Persons to ensure the auto-reclosing features, if available, are switched off.
- Direct the Switch Persons to ensure all logic control devices and transfer controls on station service supplies are disabled.
- Confirm that the appropriate tags have

been placed.

- Confirm with the Permit Holder the means of communication and frequency of the communication checks to be used for the duration of the permit.
- Issue the Hold-Off Permit to the Permit Holder.

**11.6. While Permit is in Effect**

11.6.1. The Permit Holder shall be at the work area of the specified apparatus while the Hold-Off Permit is in effect and the work is continuing.

11.6.2. If the Permit Holder must leave the work area of the specified apparatus and work is to continue the Hold-Off Permit shall be transferred.

11.6.3. If the Permit Holder must leave the work area of the specified apparatus briefly (e.g., for a communication check), the specified work shall stop during the Permit Holder's absence.

11.6.4. Before auto-reclose features are enabled or the apparatus is made dynamically alive all Hold-Off Permits shall be surrendered.

11.6.5. If apparatus covered by a Hold-Off Permit trips the Issuing Authority shall contact the Permit Holder and advise that the apparatus (by name and number) has tripped. The apparatus shall only be returned to service with the permission of the Permit Holder. If the Permit Holder

does not give permission the apparatus shall be left separated until the permit is surrendered.

11.6.6. If the Permit Holder suspects a loss of potential on the apparatus covered by the Hold-Off Permit the Permit Holder shall report immediately to the Issuing Authority. This applies whether or not anything has occurred at the work site that might cause an interruption of the apparatus.

11.6.7. A Hold-Off Permit shall be surrendered on request of the Issuing Authority whether or not work is complete.

**11.7. Surrender**

11.7.1. The Permit Holder shall surrender the Hold-Off Permit as per section 7.8.

11.7.2. A Hold-Off Permit shall be surrendered upon completion of the work or at the end of the day, whichever comes first. A Hold-Off Permit shall not be held overnight.

**11.8. Permit Switching Completion**

11.8.1. The Issuing Authority shall carry out Permit Switching Completion as per section 7.9.

## 11.9. Hold-Off Permit Tags

11.9.1. Hold-Off Permit Tags are orange (see below):


11.9.2. Hold-Off Permit Tags indicate that a device shall not be operated without the consent of the Permit Holder. They include the statement "Hold. Do not operate without consent of Permit Holder."

11.9.3. The following devices shall be tagged with Hold-Off Permit Tags:

- The remote control switch of the circuit breaker (the System Control Room shall apply a SCADA tag);

- The local control panel in remotely controlled switching stations where local switching is to be performed;
- The remote control switch for the automatic reclose devices where remote control facilities are provided (the System Control Room shall apply a SCADA tag);
- On the local device in the switching station where a remotely controlled switch for the automatic reclose device is not available; and
- All switching station power transfer controls that have been disabled (e.g., breakers).

# 12. Equipment Access Permit

## 12.1. Description

12.1.1. An Equipment Access Permit is authorization from the Issuing Authority to conduct work on apparatus where no isolation permitting is required. There are two types of Equipment Access Permits:

- Equipment Access Permit A
  - Pertains to work that will not put system security in jeopardy.
  - Examples: doing maintenance on or troubleshooting a piece of equipment, vibration analysis, making minor adjustments while equipment is running.
  - Equipment Access Permit B
  - Pertains to work that could put system security in jeopardy.
  - Examples: work on transfer trips, relay testing.

## 12.2. General Requirements

12.2.1. An Equipment Access Permit is primarily for information purposes and provides no personal protection.

12.2.2. An Equipment Access Permit ensures that the Issuing Authority is made aware of and authorizes the work being completed.

12.2.3. The Permit Holder shall provide all relevant information to the Issuing Authority prior to starting work to determine the effect the work will have on system security.

**12.3. Application**

12.3.1. Equipment Access Permit requests shall be made by a WPC authorized worker either verbally or by email to the Issuing Authority.

**12.4. Processing**

12.4.1. Equipment Access Permits shall be recorded by the Issuing Authority in the Work Protection Log. The following information shall be included in the Comments section:

- Description, nature, and location of the specific apparatus to be covered by the Equipment Access Permit.
- Expected duration of the work.

**12.5. Making Effective**

12.5.1. The Issuing Authority shall assign a permit number (refer to section 7.10) and notify the Permit Holder either verbally or by email that the permit is now in effect.

**12.6. While Permit is in Effect**

12.6.1. While the Equipment Access Permit is in effect the Permit Holder shall:

- Instruct all workers working under or near the permit that the permit is in effect and hold a documented Tailboard Meeting.
- Ensure that the work is conducted in a safe manner following the appropriate work procedures.

## 12.7. Surrender

12.7.1. An Equipment Access Permit shall be surrendered upon completion of the work or at the end of the day, whichever comes first. An Equipment Access Permit shall not be held overnight.

- If the work is not completed by the end of the work day the Equipment Access Permit shall be surrendered and the apparatus shall be tagged with Special Instructions Tags.

12.7.2. The Permit Holder shall:

- Inspect the apparatus covered by the permit.
- Inform all workers under or near the permit that the Equipment Access Permit is going to be surrendered.
- Ensure that all workers are clear of the apparatus.
- Inform the Issuing Authority that the Equipment Access Permit is no longer required.

12.7.3. The Issuing Authority shall record Equipment Access Permit as surrendered in the Work Protection Log.

## 12.8. Tags

12.8.1. There are no tags specific to Equipment Access Permits. Special Instructions Tags shall be used as per section 13.6.

# 13. Lock-out/Tag-out

## 13.1. General Requirements

13.1.1. Before a worker undertakes the cleaning, operational maintenance, repair, test, or adjustment of a piece of equipment other than a power tool, the equipment shall be locked out at each energy source control point and remain locked out during that activity.

13.1.2. A permit and Switching Plan shall be prepared prior to work on an apparatus with the potential to cause injury due to the release of hazardous energy or substances (refer to section 8).

13.1.3. All locks and tags shall be documented on the Switching Plan.

13.1.4. All isolations (Lock-out/Tag-out) shall include some form of verification testing (i.e., try-out) to ensure that the isolation is effective and:

- The apparatus being worked on will not move;
- All energy sources to the apparatus have been blocked; and/or
- All stored energy has been removed or restrained.

13.1.5. Verifying testing may include:

- Checking that the correct points of isolation are used and they are in the isolated position;
- Testing for zero pressure, zero volts, zero movement, etc.;

- Checking that all stored or residual energy is removed or restrained; and/or
- Attempting to operate the equipment controls remotely or pressing the start button locally.

13.1.6. All points of isolation shall be locked out and tagged out (e.g., one tag for every lock) with the key removed and kept in possession of the Permit Holder at all times.

13.1.7. Only NTPC-issued locks and tags shall be used for lock-out/tag-out: personal locks and lock box locks.

13.1.8. Each worker working on the same apparatus or permit shall have the ability to place a lock and tag on the isolation points, either by placing a personal lock and tag directly on the isolation device or by placing their lock and tag on the lock box.

- Locks and tags shall only be placed with the permission of the Permit Holder.
- The tag shall contain the permit number, name of lock owner, and date.
- The placement of the lock and tag shall be noted in the Comments section of the Switching Plan.

13.1.9. After lock-out devices have been installed the Permit Holder shall ensure the apparatus is inoperative before work starts.

13.1.10. No person shall remove a lock-out device except the worker who installed the lock-out device. Where it is not possible to use a

worker's key to remove a lock (e.g., key is lost, worker is not available) refer to section 13.5.

13.1.11. Intentional removal of a lock-out device without authorization is an unsafe act and shall result in disciplinary action.

13.1.12. All locks and tags shall be removed after the permit is surrendered.

## 13.2. Lock-out

13.2.1. Personal Locks

- A worker's personal lock is their guarantee that an apparatus is safe to work on.
- Personal locks shall either be used directly on points of isolation or on the lock box.
- The worker shall remove the key from their personal lock and maintain possession on their person at all times.

13.2.2. Multiple Hasp Locking Device(Scissor Lock)

- If personal locks are used for a limited number of isolation points, or if an isolation point is common to more than one permit each worker shall have the ability to place their lock and tag on the isolation point using a multiple hasp locking device.
- The last person to remove their lock & tag shall check the state of the apparatus covered by the permit to ensure all workers are clear.

13.2.3. Lock Box

- If the number of isolation points exceeds the number of personal locks a worker has, a lock box shall be used.
- Lock-out locks are sets of multiple locks that are keyed alike with one available key. Lock sets are contained in lock boxes and colour coded by set.
- Each plant shall be fitted with enough lock boxes to allow normal workloads to continue.
- A lock box shall only be used for one permit at any one time.
- Once all locks are in place, the key and any remaining locks shall be placed in the lock box.
- The lock box shall then be locked with the Permit Holder's personal lock and tagged, and each worker shall have the ability to place a lock and tag on the lock box.
- A copy of the Switching Plan, which indicates where all locks have been placed, shall be made available to all workers.
- Upon completion of the work, each worker shall remove their own personal lock from the lock box.
- The Permit Holder shall, prior to the removal of their lock and tag, shall check the state of the apparatus covered by the permit to ensure all workers are clear.

### 13.3. Tag-out

13.3.1. Tags are visual indicators of permits and the state of apparatus.

13.3.2. There are specific tags associated with each type of permit (refer to sections 9, 10, 11).

13.3.3. The requirements for tags include:

- Tags shall be completely and legibly filled out with all applicable information.
- Tags shall include the permit number, name of Permit Holder, date, and apparatus number.
- All tags shall be placed and removed according to the Switching Plan.
- Tags shall be affixed with non-conductive material (e.g., plastic tie wrap, string).
- Tags shall be placed in conspicuous locations.
- Tags shall only be placed by authorized workers.
- All permit tags shall be placed before a permit is issued and shall be removed after the permit is surrendered
- Tags shall be destroyed and disposed of after removal.
- If an isolating or de-energizing device is used for more than one Work Permit, a tag shall be placed for each permit.
- The placing of SCADA tags is considered to be equivalent to the

placing of tags only and does not provide Work Protection.

### 13.4. Transmission & Distribution Locking and Tagging

13.4.1. There are special instances where placement of a lock is not feasible. Therefore the placement of a tag guarantees the isolation point (e.g., line applications, manual local/remote switches, switches, valves).

### 13.5. Removal of Lock when Key Unavailable

13.5.1. In the event that a lock must be removed but the key is not available, the Work Protection Code (WPC) Manager shall determine the reason the worker's key is not available (e.g., key lost, Lock Holder unavailable) and whether it is safe to remove the lock.

13.5.2. The Lock Holder shall immediately report a lost key to the WPC Manager.

13.5.3. In the event that the Lock Holder is not available the WPC Manager shall make a minimum of two attempts to contact the Lock Holder by telephone. If the Lock Holder is reached they shall return to the work site to remove their lock.

13.5.4. If the key is not available, or if the Lock Holder cannot be reached or cannot travel to the work site, the following steps shall be taken:

- The WPC Manager shall complete

Form 14.03.6: Lock Removal Authorization and submit it to the Issuing Authority.

- The WPC Manager shall verify the apparatus is safe for lock removal.
- The WPC Manager shall ensure personnel in the area and/or working under the permit are notified that the lock will be removed.
- The WPC Manager or designate shall be physically present on site before the lock is removed.
- The WPC Manager or designate shall remove the lock from the isolation point.
- The WPC Manager or designate shall attach a new lock if the job has not been completed.
- The WPC Manager shall ensure the permit and Work Protection Log is updated.
- The Lock Holder shall be notified as soon as possible about the status of the lock-out.

## 13.6. Special Instructions Tags

13.6.1. Special Instructions Tags are white with a blue hatched border (see below).


13.6.2. Special Instructions Tags are not a form of Work Protection.

13.6.3. Special Instruction tags are attached to an apparatus or control device to provide temporary operational information that the user of the apparatus would not normally be aware of. For example:

- Removed from service.
- Equipment out-of-service or damaged.

- Do not operate.

13.6.4. Prior to attaching a Special Instructions Tag to an apparatus the worker shall contact the Plant Superintendent/Operator.

13.6.5. Instructions shall be written on the tag, as well as printed name of the worker and the date. The tag shall then be attached to the apparatus.

13.6.6. Special Instructions Tags shall only be removed by the Plant Superintendent/Operator once the special instructions are no longer required.

13.6.7. The Plant Superintendent/Operator shall document the attachment and removal of Special Instructions Tags in the Plant Operating Log.

# 14. Work Protection Code Review

**14.1.** NTPC shall establish and maintain a Work Protection Code Review Committee.

**14.2.** The Committee shall consist of a maximum of 10 members with two members from each of the following Divisions:

- Asset Management & Engineering
- Health, Safety & Environment
- Hydro Operations
- Thermal Operations
- Transmission & Distribution

**14.3.** The Committee shall consist of both workers and managers as selected by their respective Divisions.

**14.4.** Names of Committee members shall be posted on the NTPC Intranet.

**14.5.** The Committee shall be chaired by a member of the HSE Division.

**14.6.** The Committee shall meet a minimum of once every two years, or more often where circumstances require, to review and discuss the functionality of *Element 14.03: Work Protection Code* and make recommendations on any revisions to the HSE Director.

**14.7.** The HSE Division shall address all revision requests through either interpretations or revisions of the existing Code, and shall inform the Committee.

**14.8.** Requests from workers for review, revision, or interpretation of the Work Protection Code shall be submitted in writing to a member of the Committee.

# 15. Training

**15.1.** Work Protection Code (WPC) training shall be provided to:

- Permit Holders (all workers required to hold Work Protection permits);
- Permit Issuers (all workers required to issue Work Protection permits (i.e., System Issuing Authority, Local Issuing Authority));
- Switch Persons; and
- Work Protection Code Managers.

**15.2.** WPC Managers shall ensure WPC training is provided to their workers.

**15.3.** WPC training shall be competency-based.

**15.4.** WPC training shall be provided based on individual application of the WPC. All workers shall receive general WPC training as well as specific training by applicable permit type.

**15.5.** WPC training shall be documented on Form 14.03.10: Work Protection Code Training Record. This form shall include the worker's name, the date of training, which permits they are authorized to hold, and whether they will be a trainer and/or an Issuing Authority.

**15.6.** The following training records shall be submitted by email to the Training & Development Specialist for filing:

- Form 14.03.10: Work Protection Code Training Record; and
- NTPC Work Protection Code

Participants Notes.

**15.7.** Workers who successfully complete the WPC training shall be considered WPC Authorized Workers and shall be added to Form 14.03.8: Authorized Work Protection List by the Training and Development Specialist.

**15.8.** The Authorized Work Protection List shall be maintained on the NTPC Intranet by the Training & Development Specialist.

**15.9.** Only workers on the Authorized Work Protection List shall issue and/or hold Work Protection permits.

**15.10.** The Authorized Work Protection List shall contain the following information for all WPC authorized workers:

- Name.
- Position.
- Home location.
- Effective date.
- Whether the worker is a trainer.
- Whether the worker is an Issuing Authority.
- Comments/Restrictions.
    - By default workers are trained to hold all permits. If a worker is trained to only hold certain permits, those permits shall be listed here.

**15.11.** It is the responsibility of the WPC Managers to determine when workers require WPC refresher training. WPC refresher training shall be provided as follows:

- When there are changes to the WPC;

- To workers who have Work Protection incidents;
- To workers who display a misunderstanding of the application of the WPC; or
- A minimum of every two years.

## 16. Documentation

- *Form 14.03.1: Work Permit*
- *Form 14.03.2: Work & Test Permit*
- *Form 14.03.3: Hold-Off Permit*
- *Form 14.03.4: Switching Plan*
- *Form 14.03.5: Surrender when Permit Holder is not Available*
- *Form 14.03.6: Lock Removal Authorization*
- *Form 14.03.7: Permit Issuer Guide*
- *Form 14.03.8: Authorized Work Protection List*
- *Form 14.03.9: Work Protection Log*
- *Form 14.03.10: Work Protection Code Training Record*
- *Form 14.03.11: Electrical System Security*
- *Form 14.03.12: Permit Transfer*
- *Hold-Off Permit Tag*
- *Special Instructions Tag*
- *Work Permit Grounded Tag*
- *Work Permit Hold Tag*
- *Work Permit Hold/Operate Tag*
- *Work & Test Permit Grounded Tag*
- *Work & Test Permit Tag*

# SECTION 10: GLOSSARY

## NOTES

**Abuse of Authority**
Improper use of the power and authority inherent in a management position to endanger a worker's job, undermine the performance of that job, threaten the economic livelihood of the worker, or in any way interfere with or influence the career of the worker. It does not include the legitimate and proper exercise of a manager's responsibilities including disciplinary measures, distribution of work assignments, training, staffing decisions, or performance evaluations.

**Accident**
An incident that results in injury, damage, or loss.

**Airline Respirator**
A breathing device that consists of a full face mask with a long hose that connects to a freestanding tank of compressed air.

**Air Purifying Respirator**
A respirator with an air-purifying filter, cartridge, or canister that removes specific air contaminants by passing ambient air through the air-purifying element.

**Alcohol**
The intoxicating agent in beverage alcohol or any low molecular weight alcohols such as ethyl, methyl, or isopropyl alcohol. Includes beer, wine, spirits, and medications that contain alcohol.

**Alive (Energized)**
Capable of delivering either charged or dynamic energy.

**Amended Water**
Water to which surfactant (wetting agent) has been added to increase the ability of the liquid to penetrate asbestos containing materials.

**Apparatus**
Equipment pertaining to the generation, transmission, distribution, and use of electrical energy (e.g., lines, transformers, breakers, pumps, motors, valves, relays).

**Approach Boundaries (Shock Protection Boundaries)**
Defined zones surrounding exposed live electrical apparatus where shock hazard exists (Limited Approach Boundary and Restricted Approach Boundary).

**Arc Blast**
The explosive expansion of both the surrounding air and the metal in the arc path caused by the tremendous temperatures of an arc. Associated dangers include:

- High temperatures (up to 15,000$^{o}$C – four times the temperature of the Sun's surface);
- High pressures (can impact a worker's body and throw the worker);
- Sound (up to and exceeding 160 dB);
- Toxic fumes (due to vaporized metals and other materials); and
- Flying debris (material & molten metal thrown from the arc at over 700 miles per hour).

**Arc Flash**
An unexpected and sudden release of heat and light energy produced by electricity travelling through air. It is caused by an electrical fault and results in an explosion of light, heat, pressure, fire, toxic fumes, noise, and molten metal that can cause serious injury or death.

**Arc Flash Boundary**
An approach limit at a distance from exposed live parts within which a person could receive a second degree burn if an electrical arc flash were to occur.

**Arc Flash Suit**
A complete Category 4 flame resistant clothing and equipment system that covers the entire body, except for the hands and feet. This includes pants, jacket, and beekeeper-style hood fitted with a face shield.

**Arc Flash Hazard**
A dangerous condition associated with the potential release of an electric arc.

**Arc Rating**
The maximum incident energy resistance demonstrated by a material (or layered system of materials) prior to break open or at the onset of a second-degree skin burn. The arc rating is expressed in calories/$cm^2$.

**Asbestos**
A fibrous mineral substance used for its insulating and fire resistant properties and known to cause health issues including lung cancer, asbestosis, and mesothelioma.

**Asbestos Dust**
Dust consisting of or containing asbestos fibres.

**Asbestos Process**
The handling of asbestos containing materials, including:

- Sawing, cutting, sanding or spraying materials;
- Repair, maintenance, replacement or removal of surfaces of asbestos containing materials;
- Cleaning or disposal of asbestos containing materials;
- Mixing or applying asbestos shorts, cements, grouts, putties or similar compounds;
- Storage or conveyance of asbestos containing materials; and
- The demolition of structures that use asbestos containing materials.

**Audit**
A systematic and independent examination or evaluation of objective evidence to verify the adequacy of and compliance with established systems. An audit is conducted against defined standards.

**Authorized Worker**
A worker given documented authority by NTPC to conduct specific work.

**Awareness Training**
Broadly based training to increase the awareness of general and specific health & safety issues and subjects.

**Calorie**
The amount of energy required to raise one gram of water one degree Celsius at one atmosphere. The onset of second-degree burns may occur at 1.2 calories per centimeter squared per second (1.2 cal/cm$^2$/s).

**Calories per Centimeter Squared (cal/cm$^2$)**
The number identifying the amount of energy that can be delivered to a point at a particular distance from an arc flash.

**Cartridge**
A component of a respirator that removes vapours and/or gases from the air inhaled by the person wearing the respirator.

**Charged Energy**
The energy available when apparatus is electrically charged or contains stored mechanical energy.

**Close Worksite**
A worksite that is less than ½ hour travel time to a medical facility.

**Complaint**
A formal, documented report of discrimination, violence, or harassment in the workplace from co-workers, contractors, or the public.

**Code of Practice**
A guidance document produced by a regulatory body, employer, or union that, if approved by relevant legislation, can be used as evidence.

**Competent Worker**
A worker with the training, knowledge, and experience to perform specific work.

**Confined Space**
An enclosed or partially enclosed space (e.g., bin, pipeline, pit, sewer, silo, tank, tunnel, utilities vault, vat, vessel) that:

- Is not primarily designed or intended for human occupancy, except for the purpose of performing work; and
- Has restricted means of entrance and exit.

**Confined Space Entry Plan**
An administrative tool used to document the completion of a hazard assessment for each confined space entry and ensure the health & safety of workers who enter or work in the confined space.

**Consultation**
Drawing on the knowledge, experience, and ideas of workers and encouraging their participation and input to improve the systems in place for managing health & safety.

**Controlled Document**
A document that is relevant to health & safety, subject to future revision, and is required to be of current issue at the point of use.

**Consumer Product**
A hazardous substance that is purchased from a retail store and does not require an SDS or supplier label. Consumer products in the workplace should have SDS available for guidance and reference.

**Contract**
Any signed agreement between NTPC and a contractor (e.g., contract, service agreement).

**Contract Administrator**
An NTPC employee responsible for the administration and management of contracts and service procurement documents (e.g., tenders, requests for proposals, requests for quotes, sole sourcing).

**Contractor**
Any person or entity that has been contracted, sub-contracted, or otherwise engaged to provide services to NTPC.

**Controlled Product**
A hazardous substance that falls under the WHMIS or TDG legislation (Hazardous Products Act). Controlled products are purchased from a supplier.

**Control Zone**
The area within 2 m of an unguarded edge of a level, elevated work surface 3 m or more in height.

**Damage**
Harm to property or environment.

**Dangerous Goods**
Solids, liquids, or gases that can harm people, other living organisms, property, or the environment as defined by the Transportation of Dangerous Goods Act and Regulations.

**dB**
Intensity of sound measured in decibels.

**dBA**
The frequency-weighted value of the sound level determined with a sound level meter. Relates the sensitivity of the human ear to each sound frequency.

**dBA Lex**
Total noise exposure to a worker over period of time.

**De-energized**
The state that exists when:

a) In the electrical sense: Electrical apparatus is isolated and grounded.
b) In the mechanical sense: Mechanical apparatus is isolated and all sources of dynamic energy have been dissipated (e.g., thermal, chemical, kinetic, electrical, pneumatic, and hydraulic energy).

**Direct Cause**
The immediate events or conditions that caused the incident.

**Discrimination**
Harassment based on racial, religious, national origin, disability, age characteristics, or veteran status that makes a worker uncomfortable at work or interferes with a worker's ability to perform the job.

**Distant Worksite**
A worksite that is ½ – 2 hours travel time to a medical facility.

**Distribution System**
A system of remotely and non-remotely controlled electrical apparatus connecting NTPC generation and transmission to the customer's equipment.

**Document Control**
A system of managing, distributing, and controlling documents.

**Drug**
Alcohol, illicit drugs, medication, or any other substance, the use of which has the potential to change or adversely affect the way a person thinks, feels, or acts.

**Dynamic Energy**
The energy available when electrical or mechanical apparatus is connected to a source of energy. Includes thermal, chemical, kinetic, electrical, pneumatic, and hydraulic energy.

**Dynamically Alive**
Connected to a source of dynamic energy (e.g., electrical generator, storage battery, compressed air, other source of energy).

**Electrically Isolated Zone**
A zone between isolation points created by the electrical isolating devices for the permit.

**Electrically Safe Zone**
A zone that is isolated and de-energized and all electrically charged energy hazards have been controlled with the use of approved bonding and grounding procedures.

**Electrical System**
The electrical generating resources, switching stations, transmission lines, interconnections with neighboring systems/utilities, and associated equipment connected to the Yellowknife/Bluefish/Snare system and the Fort Smith/Taltson system, which are under the control of the System Issuing Authority.

**Electrical Test**
A specific test that allows energization of specific apparatus under controlled conditions (e.g., insulation testing).

**Emergency**
An abnormal condition or event which has caused, is causing, or has the potential to cause serious injury and/or damage and requires a prompt and coordinated response.

**Emergency Declaration Guidelines**
A process to be followed in the event of an incident and anticipated emergency to determine the level of emergency.

**Emergency Response Plan**
A set of documented procedures to control site operations in the event of any anticipated emergency.

**Employer**
Anyone having charge of an establishment in which one or more workers are engaged in work (i.e., partnership, group of persons, corporation, owner, agent, principal contractor, subcontractor, manager, or other authorized person). Does not include a supervisor or a self-employed person.

**Environmental Impact**
Any change to the environment, whether adverse or beneficial, wholly or partially resulting from an organization's activities, products, or services.

**Environmental Incident**
An event that caused or could have caused an adverse environmental impact.

**Ergonomics**
The science relating human capabilities to the work task factors such as physical environment, information processing, work organization, tools and equipment, and manual material handling.

**Exposure Hours**
The number of hours worked by NTPC workers. Does not include leave or training. Used in the calculation of health & safety statistics.

**Facial Seal**
The seal of the tight-fitting face-piece of a respirator to the face.

**Fall Protection System**
Includes:

- A control zone;
- A personal fall arrest system;
- A travel restraint system.

**Fire Watch**
A worker who monitors a hot work area to identify and control fire hazards and respond to fires.

**First Aid**
Immediate assistance given to an injured person until medical aid has been obtained.

**First Aid Attendant**
A person who holds a current qualification in First Aid.

**First Aid Injury**
A workplace injury that requires first aid treatment only, whether applied by a first attendant or health care provider, and does not result in lost days.

**First Aid Kit**
An approved container with approved first aid supplies.

**Fit for Duty**
Able to safely and acceptably perform assigned duties without any limitations due to the use or after-effects of alcohol, illicit drugs, medications, or other substances.

**Fixed Equipment**
Equipment designed and installed to remain stationary during normal operation (e.g., diesel/hydroelectric generators, compressors, hoists, transformers, incinerators, presses, bench drills).

**Flame Resistant (FR)**
The property of a material whereby combustion is prevented, terminated, or inhibited following the application of a flaming or non-flaming source of ignition, with or without subsequent removal of the ignition source.

**Flame Retardant**
A compound(s) added to manufactured material to inhibit, suppress, or delay the production of flames to prevent the spread of fire (i.e., to make it flame resistant).

**Forms**
Tools used by workers to record and document information in support of the Health & Safety Management System and procedures.

**Friable**
Material that is easily crumbled (e.g., by hand).

**Grounded**
Intentionally connected to earth through a conducting connection or connections of sufficiently low impedance and having sufficient current-carrying capacity to prevent the build-up of voltages that may result in undue hazards to workers and/or connected equipment.

**Guarantee of De-Energization**
A guarantee by the Issuing Authority that a specified apparatus is electrically and mechanically de-energized.

**Guarantee of Isolation**
A guarantee by the Issuing Authority that a specified apparatus is in the isolated state.

**Guarantee of Non-Reclose (Hold-Off)**
A guarantee by the Issuing Authority that, in the event of the operation of the protective tripping device, a specified apparatus will not be made dynamically alive. This is done by ensuring auto-reclose features are switched off and manual reclose is not allowed.

**Harassment**
Unwanted conduct with the purpose or effect of violating an individual's dignity creating an intimidating, hostile, degrading, humiliating, or offensive environment for an individual. Includes psychological abuse such as comments, rumors, swearing, verbal abuse, bullying, pranks, arguments, and any overt or suggestive behavior.

**Hazard**
A condition, device, or substance that could cause injury, damage, or loss.

**Hazard Assessment**
Identification of hazards and assessment of the risks associated with those hazards.

**Hazard Control**
Reduction or elimination of the risks associated with a hazard.

**Hazard Identification**
Formal recognition and documentation of hazards.

**Hazard Information**
Information on the correct and safe use, storage, handling, and manufacture of a controlled product, including information relating to its toxicological properties.

**Hazardous**
Likely to cause injury, damage, or loss in certain circumstances.

**Hazardous Atmosphere**
An atmosphere that may expose workers to the risk of death, incapacitation, impairment of ability to self-rescue (i.e., to escape unaided), injury, or acute illness. A hazardous atmosphere occurs when:

- The atmosphere does not have a safe oxygen level.
- The concentration of oxygen in the atmosphere increases the fire risk.
- The concentration of flammable gas, vapour, mist, or fumes exceeds five percent of the lower explosive limit for the gas, vapour, mist, or fumes.
- Combustible dust is present in a quantity and form that would result in a hazardous area.

**Hazardous Confined Space**
NTPC shall regard all confined spaces as Hazardous Confined Spaces. A confined space that is, or may become, hazardous to a worker entering or already in the confined space due to:

- The design, construction, location, or atmosphere of the space;
- The materials or substances in the space;
- The work activities or processes used in the space; or
- Any other conditions relating to the space.

**Hazardous Location**
A place where fire or explosion hazards may exist due to flammable gases or vapours, flammable or combustible liquids, combustible dust, or ignitable fibres.

**Hazardous Substance**
A substance that, because of its properties, application, or presence, creates or could create a danger, including a chemical or biological hazard, to the health & safety of a worker exposed to it.

**Health Care Provider**
A person qualified to practice any of the healing professions (e.g., chiropractor, dentist, nurse, occupational therapist, optometrist, physical therapist, physician, psychologist).

**Hold**
To keep a device in a specified position.

**Hold/Operate**
To keep a device in a specified position; however specific movement/operation of the equipment/device is allowed under specific conditions according to a written procedure.

**Hot Work**
Work capable of producing arcs, sparks, flames, and/or other sources of ignition (i.e., welding, cutting, grinding).

**Hot Work Plan**
Written authorization to perform Hot Work.

**Illicit Drug**
Any drug or substance that is not legally obtainable and whose use, sale, possession, purchase, or transfer is restricted or prohibited by law (e.g., marijuana, cocaine).

**Illness**
Sickness due to exposure to workplace hazards (e.g., vomiting due to hazardous fumes, heat stroke).

**Immediately Dangerous to Life or Health (IDLH)**
Circumstances in which the atmosphere is deficient in oxygen or the concentration of a harmful substance in the atmosphere:

- is an immediate threat to life;
- may affect health irreversibly;
- may have future adverse effects on health; or
- may interfere with a worker's ability to escape from a dangerous atmosphere.

**Incident**
An unplanned, undesired event that caused or could have caused injury, damage, or loss (see Accident, Near Miss).

**Injury**
Harm to a person.

**Inspection**
An assessment of workplace conditions against a set standard.

**Isolated**
Physically disconnected or interrupted from all sources of dynamic energy with controls in place to prevent the change of position of the isolating devices (i.e., lock-out/tag-out).

**Isolated Worksite**
A worksite that is more than 2 hours travel time to a medical facility.

**Isolating Devices**
Devices capable of being either locked or secured in an effective isolating position.

**Issue**
To make effective the terms and conditions of a Work Protection permit.

**Issuing Authority**
A worker authorized to issue Work Protection permits. Includes the System Issuing Authority and Local Issuing Authorities.

**Job Safety Analysis (JSA)**
A systematic breakdown of a job into tasks/steps in order to identify hazards, assess risks, and select appropriate controls.

**Joint Occupational Health & Safety Committee (JOHSC)**
A joint worker-management team working to identify and resolve health & safety issues in the workplace.

**Level 1 First Aid Qualification**
A certificate issued by an approved agency indicating the successful completion of a First Aid training course and a cardiopulmonary resuscitation training course that meet the minimum requirements for course duration and content set out in *Schedule A* of the *NWT Occupational Health & Safety Regulations 2015* and qualifies the holder to perform the services set out in *Schedule D*. Standard First Aid training meets this requirement.

**Level 2 First Aid Qualification**
A certificate issued by an approved agency indicating the successful completion of a First Aid training course and a cardiopulmonary resuscitation training course that meet the minimum requirements for course duration and content set out in *Schedule B* of the *NWT Occupational Health & Safety Regulations 2015* and qualifies the holder to perform the services set out in *Schedule E*. Advanced First Aid training meets this requirement.

**Limited Approach Boundary**
The distance from an exposed live electrical apparatus where a shock hazard exists.

- This is the minimum distance from the energized item where unqualified persons may safely stand.
- In order to cross the Limited Approach Boundary, workers shall be qualified to perform the required work and shall use the appropriate personal protective equipment (PPE).
- The Limited Approach Boundary shall not be crossed by unqualified persons unless escorted by a Qualified Worker and wearing the appropriate PPE.

**Local Issuing Authority**
A worker who is authorized to issue Work Protection permits in a specified work area that is separated from the Electrical System.

**Locally Controlled Apparatus**
Apparatus that can only be controlled and operated on site and cannot be remotely controlled.

**Lock**
An approved device of such durability and key code complexity that removal by any means other than with the specific key would require excessive force or unusual techniques such as metal cutting tools.

**Lock Box**
A box containing a set of multiple locks that are coloured and keyed alike with one available key.

**Lock Holder**
A worker who places a lock on an isolating device or lock box.

**Lock-out**
To isolate all energy sources from an apparatus and to secure each isolation point with an approved lock-out device.

**Lock-out Device**
A device that uses a lock and single key to hold a control device in an inoperable position.

**Loss**
Avoidable waste of any resource (e.g., equipment, materials, process, time).

**Lost Time Injury**
Any workplace injury/illness resulting in lost days beyond the date of injury.

**Maintenance**
Work performed on equipment specifically to prevent faults from occurring (e.g., tests, measurements, adjustments, parts replacement).

**Management**
Those individuals with some level of authority, responsibility, and accountability within NTPC. This includes executives, directors, and managers, and may include supervisors.

**Manual Handling**
Any activity requiring human force to lift, carry, push, pull, restrain, or hold a load.

**Mechanically Safe Zone**
A zone that is isolated and de-energized and where all sources of energy have been dissipated and controlled (e.g., thermal, chemical, kinetic, electrical, pneumatic, and hydraulic energy).

**Medical Advisor**
A WSCC physician who provides medical opinions and advice to WSCC employees to assist them in the administration and management of workers' claims.

**Medical Facility**
A medical clinic or office where a medical professional is readily available.

**Medical Treatment Injury**
An injury of moderate severity that requires treatment beyond first aid from a health care provider, but does not result in lost days.

**Medication**
Any drug obtained legally, either over the counter or through a health care provider's prescription.

**Musculoskeletal Injury**
An injury or disorder of the soft tissues, including tendons, ligaments, blood vessels, and nerves or related soft tissues arising from exposure to risk factors such as awkward posture, repetitive motions, and forceful exertions. These injuries can be acute or cumulative.

**Near Miss**
An incident that, under slightly different circumstances, could have resulted in injury, damage, or loss.

**Noise-Exposed Workers**
Workers who are exposed to a noise exposure level greater than 85 dBA based on an 8-hour work day and 40-hour work week.

**NTPC Business**
All activities undertaken by NTPC workers in the course of performing duties for NTPC, whether conducted on or off NTPC premises or worksites.

**NTPC Emergency Preparedness Plan**
A set of documented procedures to prepare for emergency and guide NTPC operations in the event of emergency.

**NTPC Premises**
Includes, but is not limited to, all land, property, buildings, offices, facilities, grounds, parking lots, garages, sites, equipment, and vehicles owned, leased, managed, or used by NTPC, regardless of location.

**Operable Device**
For the purpose of a *Work Permit* and a *Work & Test Permit*, an isolating or de-energizing device that will change state while the permit is in effect for the purpose of controlled movements of mechanical apparatus during maintenance or inspection.

**Pandemic Emergency Preparedness Plan**
A set of documented procedures to prepare for a pandemic emergency with measures for prevention, preparedness, response, and recovery.

**Permit Applicant**
An authorized worker applying for a Work Protection permit.

**Permit Holder**
A WPC authorized worker to whom a Work Protection permit has been issued.

**Permit Zone**
The area inside the Points of Protection of a permit.

**Personal Lock**
A uniquely-keyed lock assigned to, and used only by, a specific worker for use in lockout applications.

**Points of Protection**
The isolating or de-energizing devices used to establish the Permit Zone for a permit.

**Policy**
A general statement of an organization's commitment, responsibilities, and resources necessary to achieve a particular objective.

**Personal Fall Arrest System**
A system consisting of a full body harness and a lanyard equipped with a shock absorber or similar device.

**Personal Protective Equipment**
Clothing or equipment required to be worn or used by a worker to reduce the risk of injury.

**Powered Mobile Equipment**
A self-propelled machine or a combination of machines designed to manipulate or move materials or to provide a work platform for workers (e.g., lifts, heavy equipment).

**Preventative Maintenance**
The systematic care and protection of tools, equipment, machinery, and vehicles in order to keep them in a safe and usable condition, limit downtime, and extend productivity.

**Production Loss Accident**
An accident that results in a loss of production.

**Program**
An integrated set of rules and activities in place to manage a particular area of health & safety.

**Project**
A non-routine series of tasks planned from beginning to end with defined durations, resources, and results. For the purpose of Project Safety Planning equipment purchases, consultants, studies, and routine operations & maintenance work are not considered projects.

**Project Manager**
An NTPC employee, typically an Engineering or Operations Manager, who is given the overall responsibility and authority for the successful completion of a project.

**Property Damage Accident**
An accident that results in damage to property (i.e., vehicles, tools, equipment, infrastructure).

**Qualified Worker**
A worker with the training, knowledge, experience, and recognized certification to perform specific work.

**Qualitative Fit Test**
A pass/fail test method to evaluate the fit of a specific make, model, and size of respirator on an individual. The test relies on the subject's sensory response to detect a challenge agent (i.e., irritant smoke).

**Regulation**
A document made under the NWT Safety Act containing detailed provisions on aspects of health & safety at work.

**Recordable Injury**
Any workplace injury/illness resulting in a fatality, lost time, medical treatment, restricted work, significant occupational injury/illness, or loss of consciousness. Does not include first aid injuries.

**Remotely Controlled Apparatus**
Apparatus that is under the control of the System Issuing Authority (i.e., from the System Control Room).

**Respirator**
An apparatus worn over the mouth and nose or the entire face to prevent the inhalation of dust, smoke, or other noxious substances.

**Restricted Approach Boundary**
The distance from an exposed live electrical apparatus where an increased risk of shock exists due to the potential for inadvertent movement to result in electrical over-arc.

- The Restricted Approach Boundary shall only be crossed by Qualified Workers with the appropriate PPE, training on the work to be performed, and a written work plan that includes shock-protection techniques and equipment.

**Restricted Area**
An area of a worksite where there is a reasonable chance of the concentration of airborne asbestos exceeding the 8-hour occupational exposure limit.

**Restricted Work Injury**
Any workplace injury/illness resulting in the modification of the injured worker's duties as prescribed by a health care provider in order to accommodate recovery from the injury.

**Return-to-Work Program**
A process to help injured workers return to safe, productive, and suitable employment as soon as medically possible.

**Risk**
The probability of an unwanted event occurring due to a specific hazard.

**Risk Assessment**
Evaluation of the risks associated with each hazard.

**Risk Level**
The level of risk assigned following Risk Assessment (i.e., low, moderate, high, extreme).

**Risk Score**
Risk is measured in terms of consequence, exposure, and probability, which are combined together to form the Risk Score.

**Road Travel**
Travel on highways between communities and on winter roads.

**Rule**
A directive instituted by an organization that governs and controls conduct or action.

**Safe Job Procedure**
A documented set of specific steps required to carry out a job safely and efficiently (e.g., painting a building, brushing a right of way, changing oil).

**Safe Work Practice**
A guideline for the safe performance of a task or activity (e.g., ladder use, chainsaw operation, boat operation). Safe Work Practices are typically incorporated into Safe Job Procedures.

**Safe Work Zone**
A specified area where all sources of electrical and mechanical energy are eliminated or controlled.

**Safety Data Sheet (SDS)**
A document containing important health & safety information about a controlled product (e.g., product name, hazardous ingredients, first aid measures, health effects).

**Safety Orientation**
Initial training given to workers prior to commencing work with an organization.

**SCADA (Supervisory Control And Data Acquisition)**
A computer system that provides remote monitoring and control of apparatus.

**SCADA Tag**
A visible indicator placed by a System Control Operator on SCADA software to prevent the remote operation of a specific device. SCADA tags are considered to be equivalent to the placing of tags only and do not provide Work Protection.

**Seal Check**
An action conducted by the user to determine if the respirator is properly seated to the face.

**Self-Contained Breathing Apparatus (SCBA)**
A respirator with independent air supply carried by the user.

**Separated**
Physically disconnected or separated from all sources of dynamic energy with no controls in place to prevent the change of position of the separating devices.

**Sexual Harassment**
Harassment based on one's gender including unwelcome sexual advances, requests for sexual favors, and other verbal or physical conduct of a sexual nature.

**Site Specific Emergency Response Plans**
A set of documented procedures to guide site operations in the event of any anticipated emergency.

**Site Supervisor**
An employee or contractor assigned to supervise a worksite.

**Specified Apparatus**
Apparatus within the Permit Zone upon which work is authorized.

**Standard**
A norm, convention, or requirement as published by the Canadian Standards Association.

**Suitable Work**
Pertaining to a Return-to-Work program, is work:

- the worker can do and is within their functional abilities;
- the worker already has the skills to do, or can be safely trained to do;
- that does not pose a health or safety risk to the worker, co-workers, or the general public;
- that restores pre-injury earnings, where possible; and
- that is meaningful and promotes the worker's healthy recovery.

**Supervisor**
An individual who is authorized by an employer to oversee or direct workers.

**Surrender**
To give up a permit and the rights and protection afforded by the permit.

**Switching**
Changing the state of apparatus and/or placing/removing a lock or tag.

**Switching Plan**
A step-by-step procedure to remove an apparatus from service and to return the apparatus to service.

**Switch Person**
A worker authorized by NTPC to perform switching operations for Work Protection permits.

**System Control Operator**
A worker based in the System Control Room who is authorized by NTPC to administer System Issuing Authority.

**System Control Room**
The location from which the System Control Operator works, located in the Jackfish Plant in Yellowknife and staffed 24 hours per day.

**System Issuing Authority**
The System Control Operator that is authorized by NTPC to issue Work Protection permits relating to the Electrical System.

**System Security**
Assurance that when apparatus is operated it will not affect the ability of the generation, transmission, or distribution apparatus to perform as intended.

**Tag-out**
To attach the appropriate Work Protection tag to a lock-out device.

**Tailboard Meeting**
A short, documented pre-job meeting conducted at the job site by the workers to discuss the work to be done, the hazards present, and the safety measures that will be put in place to control risk.

**Task-Specific Training**
Special training required by individuals to perform their work.

**Tight-fitting Face-piece**
A respirator inlet covering that forms a complete seal with the face. This includes:

- Quarter face-piece (covers user's nose and mouth above the chin).
- Half face-piece (covers user's nose and mouth under the chin).
- Full face-piece (covers user's eyes, nose, and mouth under the chin).

**Travel Restraint System**
A system that prevents a worker from travelling to the edge of a structure or to a work position from which the worker could fall.

**Undue Hardship**
The limit beyond which employers cannot accommodate a worker's return to work (e.g., when the employer cannot sustain the economic or efficiency costs of the accommodation).

**Violence**
Includes the following:

- The use, attempt, or threat of physical force against a worker.
- A statement or behaviour reasonably interpreted as a threat to exercise physical force against a worker.
- Anger-related incidents against a worker such as pushing and physical assaults.
- Property damage against a worker such as vandalism and theft.

**WHMIS**
A program that deals with hazardous substances (controlled products) in the workplace. Its goal is to protect workers who use, handle, transport, and/or store controlled products.

**Worker**
Any person (employee or contractor) conducting work on NTPC business, premises, or worksites, with or without remuneration. Includes a supervisor and a self-employed person.

**Workers' Safety and Compensation Commission (WSCC)**
The Northwest Territories regulatory body promoting workplace health & safety and the care of injured Workers.

**Working Alone**
To work as the only worker at a worksite in circumstances where assistance is not readily available in the event of illness, injury, or emergency.

**Working in Isolation**
For the purposes of this element, to work in circumstances where assistance is not readily available in the event of illness, injury, or emergency. This includes Road Travel and Remote Work.

**Work Protection**
A process to allow work to be done in a Safe Work Zone, which, when combined with safe work practices, procedures, and methods ensures the safety of workers and the security of the system.

**Work Protection Code Authorized Worker**
A worker who has successfully completed the Work Protection Code training and has been placed on the *Authorized Work Protection List* to hold WPC permits.

**Work Protection Code Managers**
The managers responsible to ensure the WPC is properly administered and carried out (i.e., Transmission & Distribution Division, Thermal Division, Hydro Division, Asset Management & Engineering Division, and Information Technology Division).

**Worksite Monitor**
An NTPC employee, or Owner's Representative (i.e., a Contractor representing NTPC), who reports to the Project Manager and is responsible for observing the performance of the project and providing feedback to the Project Manager.

**Worksite Visit**
A brief, documented assessment of hazards, controls, and safety behaviours at a worksite.

# KNOW YOUR FIRE EXTINGUISHER

## CHOOSING THE RIGHT EXTINGUISHER CAN PREVENT PROPERTY DAMAGE AND SAVE LIVES

| Extinguisher Type → / Type of Fire ↓ | Water | Foam | $CO_2$ | Dry Chemical |
|---|---|---|---|---|
| **A** Paper, Wood & Plastic  | ✓ | ✓ | ✗ | ✓ |
| **B** Flammable & Combustible Liquids  | ✗ | ✓ | ✓ | ✓ |
| **C** Electrical Equipment  | ✗ | ✗ | ✓ | ✓ |

| Safe Limits of Approach | | | | |
|---|---|---|---|---|
| **Phase to Phase Nominal (Volts)** | **Unqualified Workers & Equipment (e.g., cranes, backhoes)** | **Authorized Workers Small Tools & Materials** | **Qualified Workers Radial Booms (non-insulated)** | **Qualified Workers** |
| 0.75 kV-15 kV | 3.0 m (10') | 0.9 m (3') | 0.9 m (3') | 0.3 m (1') |
| 15-35 kV | 3.0 m (10') | 0.9 m (3') | 0.9 m (3') | 0.45 m (1.5') |
| 35-50 kV | 3.0 m (10') | 1.2 m (4') | 1.2 m (4') | 0.6 m (2') |
| 50-150 kV | 4.6 m (15') | 1.5 m (5') | 3.0 m (10') | 0.9 m (3') |
| 150-250 kV | 6.1 m (20') | 2.1 m (7') | 3.0 m (10') | 1.2 m (4') |
| 250-550 kV | 7.0 m (22') | 3.6 m (12') | 6.1 m (20') | 2.7 m (9') |