

# SCHEDULE E QEC CORPORATE POLICIES AND PROCEDURES

# 2017

# 1. GENERAL

#### 1.1 Schedule E – Company's Policies and Procedures, forms part of the Contract

Schedule E-1	QEC Safety Rule Book
Schedule E-2	Contractor Safety Program
Schedule E-3	Rentals of Contractor Supplied Equipment
Schedule E-4	WSCC Forms
Schedule E-5	Welding Instructions
Schedule E-6	General Tailboard Meeting
Schedule E-7	Incident Investigation
Schedule E-8	Surface Preparation and Painting



# SCHEDULE E QEC CORPORATE POLICIES AND PROCEDURES

**SCHEDULE E-1: SAFETY RULE BOOK** 

Forming part of the Contract





# SAFETY RULE BOOK

# INTRODUCTION

# **EMERGENCY CONTACT INFORMATION**

Hospital/Nursing Station:		
Fire:		
RCMP:		
Work Contact:		
Other:		
	32	

#### INTRODUCTION

Qulliq Energy Corporation, November 2015 Journey to Zero

"Powering Nunavummiut into the Future...Today"

# **QEC Safety Rulebook**

Welcome to the Qulliq Energy Corporation (QEC) Safety Rule Book. This booklet supersedes the QEC Safety Rule Book, July 2007.

This booklet is your guide and reference for minimum health and safety rules and standards at QEC worksites. It is an integral part of QEC's Health and Safety Management System.

In issuing this document, QEC makes no warranties, expressed or implied, that compliance with all or any documents published by QEC is sufficient on its own to ensure "on the job safety".

Each user is reminded that it is their own responsibility to ensure that all reasonable precautions for their own health and safety and that of their coworkers has been taken. This is also an individual's duty as stated in the Nunavut Safety Act.

Compliance with such rules and standards is a condition of employment for QEC employees and contractors. It is extremely important that each task is performed in a safe manner. If you do not know, **stop** – ask your supervisor before you begin work.

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#### INTRODUCTION

# President's message

In fulfilling our commitment to protect both people and property, QEC management will provide and maintain a healthy and safe work environment in accordance with industry standards and in compliance with legislative requirements. We strive to eliminate any foreseeable health and safety hazards which may result in property damage, incidents or physical injury/illness.

All employees are responsible and accountable for the company's overall health and safety initiatives. Participation by everyone, every day, is necessary for the health and safety excellence that the company strives for and expects.

An injury and incident free workplace is our ultimate goal at QEC. Collectively, through continuous health and safety efforts by all employees, we will accomplish this goal.

Please take the time to read this Safety Rule Book. Ask questions. Think about safety on every job site and before each task.

**Peter Tumilty** 

President & CEO



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# **QULLIQ ENERGY CORPORATION**

#### **HEALTH AND SAFETY POLICY STATEMENT**

Qulliq Energy Corporation is committed to providing a healthy and safe work environment for its employees, contractors, and customers. Our belief is that workplace incidents, illnesses and injuries are unacceptable and preventable.

How we will achieve this:

- By making safety a primary consideration in every decision that is made;
- Establishing and maintaining viable programs and procedures as outlined in our Health and Safety Manual and Safety Rule Book and adhering to pertinent legislative standards;
- By providing educational training, learning and communication involving Health and Safety we will effectively raise awareness and understanding of safe work practices with the ability to identify hazards and deal with them effectively;
- By continually auditing our Health and Safety programs and setting objectives with targets that will be used to monitor and measure performance and celebrate our successes:
- By involving our Joint Occupational Health and Safety Committee in identifying ways to improve our Health and Safety Program and communicating changes;
- By providing safe work practices and procedures that can be adhered to;
- By putting in place appropriate, tools, equipment and training;
- By everyone identifying and reporting potential hazards to management who will investigate and ensure corrective action is taken to prevent occupational injuries, illnesses and workplace incidents;
- By all employees understanding their rights and responsibilities and participating on issues which have an impact on their health and safety.

Management has the prime responsibility for managing Health and Safety but our on the job choices and actions regardless of our role in the company can affect our own personal safety and that of others. Therefore, all employees should join in a personal commitment to making the Qulliq Energy Corporation a leader in Health and Safety.

Julie-Anne Miller QEC Board of Directors

Chairperson

Peter Tumilty

**QEC President & CEO** 

September 30, 2015

# 1.2 ROLES AND RESPONSIBILITES

To be successful fulfilling the QEC Health and Safety Policy Statement and program requirements, participation is essential from all levels of the organization. All employees are jointly responsible for promoting a safe and healthy work environment.

# **BOARD OF DIRECTORS (BOD)**

#### **Expectations:**

The BOD is expected to provide policy direction and assume the overall responsibility for QEC's health and safety performance.

# Responsibilities:

- To ensure management develops, implements and monitors an HSE program for the Corporation; and
- To provide guidance to management in the event of any serious reportable incident.

#### PRESIDENT AND CEO

# **Expectations:**

The President and CEO is expected to provide overall leadership for the health and safety program.

# Responsibilities:

- To provide overall leadership and be accountable to the Board of Directors for QEC's health and safety management system and performance;
- To assign an HSE Manager to administer and monitor the Health and Safety program. The President will be responsible for monitoring and evaluating the performance of the HSE Manager;
- To provide leadership in performance targets as set by the HSE Department through safety talks, attending safety meetings and observations and by communicating commitment in meeting performance safety targets;



- To cooperate with and assist safety and health representatives and Joint Occupational Health and Safety Committee (JOHSC) members in the performance of their duties;
- To ensure there are corporate action plans and guidelines in support of QEC strategic health and safety direction;
- To ensure adequate resources are available to carry out the requirements of an uncompromised healthy and safe work environment:
- To ensure that each department/workplace/employee group has an appropriate system in place to meet their specific health and safety needs; and
- To personally review each serious reportable incident to ensure the root cause has been identified and that the appropriate follow-up actions are being taken and personally report any serious incidents to the chair of the board.

#### **DIRECTORS/SENIOR MANAGEMENT**

# **Expectations:**

Directors and Senior Managers are expected to provide leadership and accountability for the health and safety system in their area of responsibility.

# Responsibilities:

- To be accountable to the President and CEO for their group's health and safety performance;
- To ensure that their supervisors and project managers are able to carry out their assigned responsibilities with respect to health and safety;
- To ensure that the employees and contractors under their direction comply with all legislated and corporate health and safety requirements;
- As a member of the senior management team, to decide how to implement the health and safety program;
- As a member of the senior management team, to select the management representatives of the QEC JOHSC;
- To provide the necessary resources to support the health and safety program;



- To undertake periodic checks for compliance by way of employee suggestions, audits, inspections and investigations;
- To act on opportunities for improvements or regulatory changes brought forward from the JOHSC and/or the management team;
- To ensure that their group has an appropriate system in place to meet its specific health and safety needs;
- To ensure that appropriate guidelines and work practices and procedures are in place in conjunction with applicable legislation, regulations and guidelines;
- To personally initiate a review of each serious reportable incident to ensure the root cause has been identified and that the appropriate follow-up actions are being taken and personally reports serious incidents to the President and CEO and HSE Department;
- At least annually, to evaluate the health and safety performance of the supervisors and project leaders by performing work observations and document findings;
- To evaluate health and safety as part of employee performance appraisal;
- To ensure that appropriate emergency plans are in place and are periodically tested; and
- To be regularly visible in the work place by way of planned inspections, audits, walkabouts, attendance at safety meetings, employee orientations, etc. and demonstrates safety concern through personal action.

# **DEPARTMENT MANAGERS**

# **Expectations:**

Department Managers are expected to take an active role in the promotion of QEC's Health and Safety Program. They are expected to evaluate individuals within their responsibility to ensure that they are capable of meeting QEC's safety objectives.



# Responsibilities:

- Promote the corporate health and safety program by communicating safety issues and attending safety meetings. Support safety initiatives and include safety objectives in employee performance reviews;
- Review incident reports and corrective action measures to ensure that they are effective and produce the desired results in minimizing hazards that workers are exposed to;
- Provide the necessary resources required to accomplish the objectives of the health and safety program; and
- Insure that the performance targets that are identified by the HSE
  Department will be communicated to Project Managers and
  Supervisors. This will be achieved by participating in observations,
  reviewing incidents, reviewing the outcome of the investigations at
  safety meetings and discussing the results with supervisors and
  employees for feedback on expectations in reducing incidents.

#### PROJECT MANAGERS/PROJECT LEADS

# **Expectations:**

Project managers are expected to take an active role in the promotion of QEC's health and safety program. Managers are expected to evaluate the safety performance of individuals within their realm of responsibility to ensure that they are capable of meeting QEC's safety objectives.

# Responsibilities:

- Communicate QEC's corporate health and safety performance expectations to QEC Employees and Contractors;
- Provide direction to and review the conduct of Supervisors in regards to meeting health and safety performance targets;
- Evaluate the safety performance of individuals within their realm of responsibility.
- Take an active role in insuring that the safety performance targets are met in their area by performing observations, attending safety meetings and providing input in achieving the goals set by the HSE Department;



- Make available at the job the most current copy of the QEC Health and Safety Manual and applicable Territorial and Federal Safety Act, Regulations and other applicable Codes; and
- Ensure that all visitor(s) report to the site office and sign in on the visitors' log.

#### SUPERVISORS/AREA SUPERVISORS

# **Expectations:**

Supervisors are expected to take an active role in the promotion of QEC's health and safety program. Supervisors are expected to evaluate the performance of individuals within the realm of responsibility to ensure that they are capable of meeting QEC's safety objectives.

#### Responsibilities:

- Conduct and/or participate in the in the initial hazard assessment at the beginning of a project and on-going hazard assessments as the conditions of the project change;
- Ensure that all new hires receive safety orientations and a site specific orientation as per the safety orientation guidelines outlined in section 7 of the Health and Safety Manual;
- Ensure that monthly safety inspections are documented and submitted in a timely fashion and that corrective action has been completed. Supervisors are also responsible for conducting informal site inspections on a regular basis;
- Ensure that monthly safety meetings are held within their respective departments, that the minutes are completed and submitted to the HSE Department;
- Ensure that tailboard meetings are held within their respective departments as per the requirements outlined in section 7 of the Health and Safety Manual, that the forms are completed and submitted to the HSE Department;
- Participate in incident investigations for lost time and medical aid incidents, injuries that require modified duties, property damage and all near miss incidents for which there was potential for serious injury or property damage;



- Ensure that all QEC employees and contractors adhere to QEC's health and safety policies and take corrective action where necessary;
- Ensure that current Material Safety Data Sheet for WHMIS controlled products are updated and readily available at each site;
- Make readily available all necessary personal protective equipment, job safety equipment, materials and tools and ensure that they are in good working order;
- Submit all required safety documentation to the HSE department in a timely manner; and
- Promote and monitor safety performance targets by providing leadership to the workers by attending safety meetings and performing observation.

# **Acting Relief:**

The person acting as relief must:

- Have a clear understanding of their duties and responsibilities in relation to the Nunavut Safety Act and Workers' Compensation Act; specifically section 4, 5, and 6.
- Understand workers' rights and how to comply and take all "reasonable precautions":
  - o Right to Refuse
  - o Right to Participate
  - o Right to Know
- Understand emergency response procedures.
- Understand their accountability for the safety of the people reporting to them and their duty to "take all reasonable precautions" in providing a safe work place.

The person assigning the Role of Acting Relief must also take all precautions to ensure that the relief person understands their duties and responsibilities.



#### **WORKERS**

# **Expectations:**

All employees are to learn and abide by the health and safety standards as outlined in the QEC Health and Safety Manual and the sections of the *Nunavut Safety Act* and regulations that pertain to their work.

# Responsibilities:

- Work in accordance with Safe Work Practices and Standard Operating Procedures as instructed and as outlined in the QEC Health and Safety Manual and Nunavut Safety Regulations;
- · Refuse all work that is considered imminent danger to life and limb;
- Report and /or correct any unsafe behaviors or conditions to the supervisor;
- Ensure that all injuries, incidents, property damage are reported immediately to the supervisor so that an incident investigation can be completed;
- Participate in all safety training and communication, including monthly safety meetings and tailboard meetings;
- Use all safety devices and protective equipment required by this manual and the *Nunavut Safety Act* and Regulations; and
- Ensure the Health and Safety of all workers in your area.

#### **VISITORS**

# **Expectations:**

All site and plant visitors are expected to follow QEC's Health and Safety requirements when on site.

# Responsibilities:

- · Report to the site office upon their arrival;
- Stay with their guide at all times. Visitors must be escorted at all times whenever visiting the power plants or high hazard work-sites. A visitor may be on site unescorted if they have received a safety orientation and reviewed and signed onto the tailboard meeting; and
- · Visitors will inform personnel of their departure.



#### 1.3 RIGHT TO REFUSE UNSAFE WORK

The *Nunavut Safety Act* gives workers the right to refuse to perform any work which the worker believes is imminent danger to life and health. The Act provides specific procedures which are to be followed in the event of a work refusal. This procedure has been developed to ensure that the appropriate steps have been taken to deal with Health and Safety concerns which may lead to a work refusal.

Supervisors need to understand their obligations as outlined in the Act and follow the QEC procedure for dealing with work refusals given here. Ideally, the employee and the supervisor can resolve any work refusal without it having to progress to the next step.

#### **QEC WORK REFUSAL PROCEDURE**

#### Introduction

The purpose of this procedure is to ensure that all QEC employees and contractors are working in an environment that does not pose a risk to their health or safety. If a worker believes that a specific task that has been assigned to them poses imminent danger to life and health of themselves or others, then that worker has the right to refuse the work.

#### **Procedure**

- 1. A work refusal is initiated by an individual employee. The worker reports the work refusal to the supervisor, indicating the reasons why the work is being refused, and remains in a safe place. This is done on a Work Refusal Report Form 1-01. This can be located on the intranet under the HSE tab, forms, internal.
- 2. The workers' supervisor assesses the work refusal conditions.
- 3. The supervisor takes the necessary steps to control the hazard.
  - a. If the hazard has been controlled or eliminated and the worker feels that it is safe to return to work, the worker returns to work and no further steps to this procedure are required.



- b. If the worker feels that that the task delegated still poses a danger to the worker, the worker continues to refuse the work and further investigation is required. Steps 4 thru 7 of this procedure must be followed.
- 4. The supervisor must report the work refusal to the QEC HSE Department who will then advise the JOHSC.
- 5. The supervisor will conduct an investigation of the work refusal with the worker and another union worker present. The information complied during the investigation is recorded on the Work Refusal Report that was initiated by the worker.
  - a. If the investigation team agrees that an unsafe condition exists, and that the supervisor has resolved the problem, the worker is notified that it is safe to return to work and the worker returns to the task assigned.
  - b. If the investigation team cannot agree that the situation is no longer unsafe and the employee continues to refuse the work, the worker will be provided with alternate work until a QEC Health and Safety Specialist and the JOHSC is contacted.
- 6. The JOHSC shall then meet to discuss the finding of the investigation. If it is not practical for either the JOHSC or the H&S Specialist to be present due to the location of the work refusal, then communication throughout the investigation will be maintained either by phone or electronically.
- The QEC Health and Safety Specialist contacts the WSCC for further investigation. The worker will be assigned alternate work until the WSCC investigation has been completed and a decision has been made.

**NOTE:** Under no circumstances is an employee to be reprimanded for exercising the right to refuse unsafe work.

#### 1.4 HAZARD ASSESSMENT AND CONTROL

Qulliq Energy Corporation (QEC) strives to eliminate the possibility of injury, illness or property damage due to hazards that have not been

identified in the workplace. In order to keep the workplace a safe environment, our workers need to be able identify any danger that may cause risk to the employee.

QEC is committed to the implementation of a systematic process for the identification and control of hazards in the workplace. This will be accomplished by:

- Employees performing a comprehensive hazard assessment for all activities, equipment, processes and property under QEC's control;
- Reviewing the comprehensive hazard assessment annually to ensure its ongoing suitability for our operational needs;
- Performing task hazard assessments prior to the start of any job requiring activities which are new or unusual; and
- Ensuring that all workers required to conduct hazard assessments have received training in the assessment process.

#### 1.5 SAFETY RULES

It is the policy of Qulliq Energy Corporation (QEC) to insist that employees and contractors understand and strictly adhere to the provisions of the Nunavut Safety Act and all applicable regulations.

The duties and responsibilities of the supervisor, worker and employer, legislated in the Safety Act, are of paramount importance. Below are some, but not a complete list, of the most fundamental Safety Rules; know them and adhere to them.

Managers, Plant Superintendents, Operators, Assistant Operators and Supervisors are required to inform all employees and contractors of any additional safety rules and procedures as the need arises. Where a conflict of two or more rules occurs, the most stringent rule shall prevail.

Fundamental Safety Rules are as follows:

- 1. All incidents, injuries and property damage must be reported to the supervisor and HSE Department immediately.
- 2. Unsafe acts or unsafe conditions, including "near miss" incidents must be reported to the worksite supervisor immediately.

- 3. Workers must maintain good housekeeping in the office, shop and worksite environments.
- 4. Seats belts are to be worn at all times by drivers and passengers in all QEC vehicles.
- 5. While operating a QEC vehicle the use of electronic communication devices (cell phones including text messaging, email access, or web browsing) is prohibited. If the driver must use a cell phone, BlackBerry, or other electronic device for voice communications while the vehicle is in motion, the driver shall do one or all of the following:
  - Keep both hands on the wheel by using your phone's hands-free or speaker phone feature, if installed.
  - · Should allow the phone calls to go to voicemail.
  - Stop at a safe location to send and receive calls.
- 6. Workers will work in a safe and orderly manner referring to Hazard Assessments, Safe Work Practices, Standard Operating Procedures, Line Work Methods and Codes of Practices prior to commencing work.
- 7. Tailboard meetings must be held prior to commencing work, or if the need arises due to a change in the scope of the work.
- 8. Workers will only use tools and equipment in good repair and free of defects. Any tools or equipment that is not in good working order will be taken out of service and tagged out.
- 9. Work Protection Code must be used as per section 3 of the Health and Safety Manual for working on energized equipment.
- 10. Violence, fighting, horseplay, or practical jokes played on other workers will not be tolerated.
- 11. Smoking is permitted in designated areas only and a no smoking policy will be enforced in QEC owned vehicles, plants and buildings.
- 12. CSA approved hard hat, safety boots, safety glasses, hearing protection along with other specialized Personal Protective Equipment



shall be worn on the work site at all times. See section 5 of the Health and Safety Manual.

- 13. Fall protection must be worn whenever working at a height of three meters or more.
- 14. High-visibility safety apparel is required when working where there is low light and poor visibility, especially if working around moving vehicles.
- 15. Respirators must be worn whenever there is the potential for exposure to airborne contaminant hazards such as dust, fumes or mists.
- 16. Consumption, distribution or possession of alcohol, illegal or prescription drugs while on the job or corporate property is strictly prohibited. If an employee is required to take prescription drugs in a safety sensitive position, this matter should be discussed with the supervisor.
- 17. Except in accordance with the QEC Firearms Policy, being in possession of firearms on company premises, or on any company worksites or vehicles is cause for immediate dismissal.

# PROGRESSIVE DISCIPLINE PROCESS FOR SAFETY INFRACTIONS

Disciplinary action resulting from a violation of occupational health and safety requirements shall be progressive and shall be appropriate to the nature of the contravention, the seriousness of the offence, previous violations, and any other extenuating circumstances.

In order to ensure that all QEC employees are treated fairly, Qulliq Energy Corporation will employ Progressive Discipline for safety violations as stated in HR Progressive Discipline Policy #513.

#### 1.6 PERSONAL PROTECTIVE EQUIPMENT

It is a QEC policy that all personnel must wear and/or use appropriate PPE when they are, or reasonably may be, exposed to workplace hazards.



Where elimination, substitution, engineering and administrative controls are not reasonably practicable the PPE Policy is the last resort to prevent worker exposure to hazards found in the workplace.

All PPE utilized by QEC employees will meet the Canadian Standards Association (CSA) as well as any applicable safety regulations. Specialty PPE such as respirators, fall protection, etc., will be supplied by QEC.

All PPE used by QEC employees will be maintained in accordance with manufacturer's specifications and instructions.

Contractors are responsible for providing their employees with PPE that complies with QEC standards. QEC Project Managers are responsible for verifying contractors have QEC compliant PPE.

#### INSPECTION AND MAINTENANCE

#### Workers will:

- Inspect PPE for wear and defects before and after each use;
- · Maintain their PPE properly; and
- Remove from use immediately any PPE that is damaged or defective and report the removal to their Supervisor.

# Supervisor will:

- Ensure that all PPE that is of questionable reliability, damaged, or in need of service or repair will be removed from service immediately;
- Ensure that all PPE that has been removed from service will be tagged "OUT OF SERVICE." Any PPE tagged "OUT OF SERVICE" will not be returned to service until repaired and inspected by a qualified person;
- Maintain appropriate inspection and service logs for specialty PPE, and will ensure that all specialized PPE and associated equipment is used, tested, inspected and maintained in accordance with the manufacturer's specifications/recommendations and regulatory standards; and
- Ensure that no piece of PPE will be modified or changed contrary to manufacturer's instructions or specifications or the Nunavut Safety Act and Regulations.

The following are the minimum PPE requirements for all QEC employees and contractors.

AD

# **Eye and Face Protection**

The appropriate safety eyewear must be worn when work exposes personnel's eyes to impact, chemical exposure, foreign bodies, intense light or heat, flame, or electrical arcs. Safety eyewear must be worn at all times in the power plants. Certain operations require face protection in addition to eye protection. Unless specifically designed for such uses, face shields are not to be worn in lieu of safety eyewear. Eye protection must also be worn when performing line work.

#### **Head Protection**

Class E CSA approved hard hats are to worn in construction areas, power plants and when personnel are exposed to working environments where they might be struck on the head or strike their head against an overhead hazard. Head protection must also be worn when performing line work.

#### **Foot Protection**

CSA steel-toed (green triangle) grade of footwear, boots or shoes are required to be worn in the power plants and work areas where:

- Carrying or handling materials such as packages, objects, parts or heavy tools, which if dropped, could injure the feet;
- Materials or equipment could potentially roll over an employee's foot; or
- CSA steel-toed boots are required at all times in construction designated sites.

Visitors are not required to wear protective footwear as long as they are accompanied by a QEC employee and will not be performing any tasks while in a plant or construction designated sites.

CSA Steel-toed grade (green triangle) grade of footwear with the symbol for the Greek letter "omega" ( $\Omega$ ) are required to be worn when working with or near electrical equipment.

#### **Hand Protection**

Suitable gloves must be worn whenever there are hazards present from chemicals, sharp or abrasive objects, heat, cold or any other condition which may pose a hazard to an unprotected hand. Glove selection is based on performance characteristics of the gloves, conditions, durations of use, and hazards present.

# **Hearing Protection**

Disposable earplugs and earmuffs are available and must be worn when working in the power plants. Personnel may select either type of hearing protection. The HSE Department will supply custom-molded earplugs for personnel who, for medical reasons, cannot use standard, disposable earplugs or earmuffs.

#### **High Visibility Vests/Clothing**

High-visibility safety apparel (HVSA) is required when working when there is low light and poor visibility, especially if working around moving vehicles (cars, trucks or other machinery traveling under their own power). All QEC employees that work specifically on utilities are required to wear Class 2 or Class 3 HVSA. It is a mandatory requirement for all employees that perform meter reading and line work to wear HVSA. Workers that are working near mobile equipment or construction are permitted to wear Class 1 HVSA.

#### **Protective Clothing**

Protective clothing is used to protect workers against hazards to which they may be exposed.

On the job do not wear:

- loose or ragged clothing or cuffs;
- · greasy or oily clothing, gloves and boots; and
- finger rings.

Keep neck chains under clothing so they do not hang out. Long hair should be tied back.

# **Arc and Flame Resistant Clothing**

Treated fabrics or Arc and Flame-resistant (ARC/FR) clothing do not lose their flame-resistance when washed provided they are laundered in accordance with the manufacturer's specifications. ARC/FR clothing should be inspected periodically by the user for signs of damage. This clothing should never be washed with other clothes and never use bleach. Always follow the manufacturer's directions. Solvents should not be used to remove stains unless permitted by the manufacturer.

Damaged ARC/FR clothing shall be repaired or replaced as necessary. It shall be the responsibility of the employee who wears this clothing to report damaged ARC/FR clothing their Supervisor.

ARC/FR clothing should be worn when working on or in proximity to energized apparatus.

- Only outer clothing that is either treated with fire retardant chemicals or is inherently flame resistant shall be used;
- All garments shall have and be worn with full length sleeves extending to the wrists and full length pants extending to the ankles; and
- All foul-weather clothing shall comply with the two previous points.

#### SPECIALIZED PPE

Workers working in areas where electrical hazards are present shall be provided with and are required to use PPE that is designed and constructed for the specific part of the body to be protected and for the work performed.

Workers working at a height of 3 meters or more shall be provided with and use a fall protection system.

Any worker that is exposed to a respiratory hazard shall be provided with and are required to use respiratory protective equipment

Protective equipment shall be maintained in a safe and reliable condition. PPE shall be visually inspected before each use and any defects shall be reported immediately to the supervisor.

# **Insulated Rubber Gloves and Protective Equipment**

- Only rubber gloves that have received initial acceptance tests in accordance with the following specifications shall be used:
  - o CSA Class 3 (25 kV)
  - o CSA Class 2 (up to 20 kV)
  - o CSA Class 1 and Class 0 (used by electricians and meter work only)
  - Rubber gloves shall be:
    - o Stored and maintained in serviceable condition;
    - o Never worn inside out or without leather protectors;

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- o Laboratory tested a minimum of once every six months;
- o Exchanged any time they become damaged, or whenever the worker to whom they have be assigned has reason to doubt their serviceable condition;
- o Issued to individual workers only; and
- o Air tested and the gloves and leather protectors visually inspected immediately prior to use.

Fibre protective equipment shall be cleaned and visually inspected at least once a year or more often should the equipment become suspect.

To minimize corona and ozone damage, rubber protective equipment shall not be allowed to remain in place on an energized line longer than is absolutely necessary.

#### **Procedure for testing of Gloves:**

- Each Lines person, Electrician, Plant Superintendent and Operator are issued 2 pairs of Class 2 or 3 gloves. They are responsible for 1 pair of gloves for 180 days (6 months); the second pair is stored in the warehouse in the region that the person works.
- If the person using the gloves identifies any concerns during their pre-use inspection they should turn them into the warehouse for immediate replacement.
- The Warehouse person will exchange the gloves out on/before the 180<sup>th</sup> day (unless defects are identified earlier) and will make the arrangements to have gloves sent out for laboratory testing or replacement.

# **Personal Fall Protection Equipment**

A worker must wear fall arrest equipment if they are:

- · Working at heights of three meters or more above floor level;
- Over a pit, shaft, or operating machinery;
- · Where a fall could result in drowning; or
- Where it is impracticable to provide adequate work platforms or guarding.



There are three key components of a Personal Fall Arrest System (PFAS). Individually, these components will not provide protection from a fall. Used properly and in conjunction with each other, they form a PFAS, which becomes vitally important to safety on the job.

Only those trained to wear a PFAS and in the maintenance and inspection of the equipment are allowed to work at heights greater than three meters.

# **Equipment Components:**

- A Full-Body Harnesses: is the only acceptable form of body wear for fall arrest. The body belt is no longer recommended; and, as of January 1, 1998, most regulations governing fall protection prohibit the use of body belts for fall protection due to the concentration of fall forces on the abdomen. Full-body harnesses distribute fall forces throughout the body, substantially reducing the chance of injury. In addition, the full-body harness keeps the worker suspended upright in the event of a fall and supported while awaiting rescue.
- B Shock-Absorbing Lanyards/Lifelines: may be a shock-absorbing lanyard, tie-back lanyard, retractable lifeline, rope grab and vertical lifeline, or similar device used to connect the body wear to the anchorage/anchorage connector. The connecting device is selected based on the work to be performed and the work environment. It is critical to consider potential fall distance when determining the type of connecting device to be used.
- C Anchorage Connectors: commonly referred to as a tie-off point, may be an I-beam, column or other structural member. An anchorage connector is used to join the connecting device to the anchorage when a direct connection does not exist. It is important to select the proper anchorage/anchorage connector for ultimate safety. Anchorages and anchorage connectors must be easily accessible, capable of supporting 5,000 lbs. of force per worker, and they must be located high enough for a worker to avoid contact with a lower level should a fall occur.

Note: After a fall occurs, all components of the fall arrest system must be removed from service immediately and an incident report must be completed.

# Linemen's Body Belts

Are classified as WORK POSITIONING EQUIPMENT therefore the life span is indefinite as long as all load bearing attachment points are reinforced with manmade materials.

# **Procedure for Care of Equipment:**

Proper storage of equipment after each use is important to ensure the reliability of the equipment.

- Storage area should be clean, dry and free of exposure to fumes or corrosive elements.
- Equipment must be kept clean of all dirt, corrosives or contaminants.
- Nylon or Polyester Remove all surface dirt using a solution of water/soap on a damp sponge

# Inspection of Equipment:

Protective equipment shall be maintained in a safe and reliable condition.

# Respiratory Protective Equipment (RPE)

Respiratory hazards may include airborne contaminants such as dusts, mists, fumes, and gases, or oxygen-deficient atmospheres. While there are many non-occupational sources of airborne contaminants, there are also many materials that become airborne in an occupational setting. Inhalation is generally viewed as the most significant route of entry for toxic materials in most workplaces. The specific airborne hazards that workers are exposed to will vary and depend upon their occupation.

Respirator selection is based upon a systematic review of the airborne contaminant hazards. Knowledge of standards, regulatory criteria, and manufacturer's information on the types of respirators and limitations must be reviewed to ensure that appropriate accepted respirators are selected for the intended conditions of use. All respiratory protective equipment must be NIOSH approved (National Institute for Occupational Safety and Health) and labeled as such.



Any worker required to wear a half mask respirator must ensure that an effective seal is maintained by the removal of scalp or facial hair that may affect the seal and that they have been fit tested to ensure the effectiveness of the seal.

# 1.7 PREVENTATIVE MAINTENANCE PROGRAM

It is the policy of QEC to maintain vehicles, tools, and equipment in a condition that will maximize the safety of all company personnel in the workplace. To achieve this goal, QEC will maintain a companywide Preventive Maintenance Program that is based on documentation and record keeping of maintenance and services of the company's equipment and facilities.

Attention must be paid to all applicable regulations, standards and codes with emphasis on Manufacturer's Specifications for use, care, limitations, maintenance and training. (Read the Original Equipment Manufacturers Manual before operation of all equipment to ensure safe operation).

The qualifications of maintenance personnel are important to the success of a maintenance program. All individuals who perform maintenance work will have the appropriate skills, accreditation and/or certification. This certification applies both to company employees and to contracted maintenance services.

Scheduling and documentation of all services of company equipment will be the responsibility of Managers, Supervisors and Workers. Plant log books must also be used to document any maintenance occurring in the plants.

The supervisor shall be responsible for the application of the program in their area of the power plants and worksites. It will also be the responsibility of each supervisor to understand the legislation that applies to the service and maintenance of the company's tools and equipment.

In addition to ensuring that workers use the tools and equipment properly, it is vital that tools and equipment be properly inspected, maintained, and kept in good repair. Our maintenance program will reduce the risk of injury and damage and will enable QEC to continue to provide safe, reliable and efficient electricity.

#### 1.8 TAILBOARD MEETINGS

Communication is critical in completing job tasks safely. One of the best methods to ensure effective communications on the job is by conducting effective tailboard meetings before the start of any job or when there are changes to the process.

# Who should conduct the meetings?

- · The person with direct supervision over the workers; or
- By the person with responsibility of the work place.

# Who should participate?

 All QEC employees and contractors who are expected to have a role in the job task to be completed.

#### When to hold a Tailboard?

When people are performing work in the plant or at the job site that do not work there on a daily basis. This includes any work involving construction, installation, repair, or similar services under a contract for QEC or by a QEC employee;

- · Before any work is being performed in any power plant by operators;
- · Prior to any line work, especially before any emergency service calls;
- Before the start of a project; and
- Additional briefings if there are significant changes that occur during the course of the work or a work interruption.

# How long should a tailboard meeting be?

- Short (approximately 15 minutes) informal "safety pep talks".
- · Brief discussion if work is routine.
- More extensive if:
  - Work is complicated or particularly hazardous; or
  - Worker cannot be expected to recognize / avoid hazards on job.



Tailboards are intended to keep you and your follow workers alert and aware of accident potentials, hazards and safe working procedures.

# Topics to be covered during the tailboard:

- · Each Worker's Role/Responsibilities;
- · Work to be completed/procedures involved;
- Hazards associated with the job/work site/job site hazards and the controls required to eliminate the hazards;
- · Special precautions required;
- · Personal protective equipment requirements;
- · Energy source controls (lockout/tag-out);
- · Permit requirements (i.e. work protection/hot work);
- · Site safety, public safety, isolation;
- · Emergency action plan;
- · Rescue techniques; and/or
- CPR/First Aid.

# Documenting the job briefing:

- Tailboard form complete;
- · All participants sign off;
- · Document is displayed where all workers can review;
- · Keep form on file on site; and
- Forward copy to Area Supervisor

# 1.9 SCHEDULED SAFETY MEETINGS

Regularly scheduled safety meetings demonstrate QEC's concern for the lives and well-being of its employees. They help to build a cooperative environment, providing the employees an opportunity to contribute ideas and suggestions to improve the health and safety program. They are an excellent tool for communicating hazards that are encountered on a regular basis.

Monthly safety meetings shall be held regionally, either in person or via teleconference, for all operations and maintenance employees. The Area or Department Supervisor needs to coordinate and/or chair the meetings and ensure that minutes of each meeting are documented and forwarded to the

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HSE Department as well as all the meeting attendees. The minutes must also be posted on the HSE Board.

Quarterly safety meetings shall be held in the Baker Lake and Iqaluit Corporate Offices as there are far less hazards that employees working in an office environment are exposed to. Managers and worker needs to coordinate and/or chair the meetings and ensure that minutes of each meeting are documented and forwarded to the HSE Department as well as all the meeting attendees. The minutes must also be posted on the HSE Board.

Meetings should not be rushed so that everyone has an opportunity to provide input.

# 1.10 JOINT OCCUPATIONAL HEALTH AND SAFETY COMMITTEE (JOHSC)

A JOHSC is a joint worker-management team that assists the employer in creating and maintaining a safe workplace. The JOHSC provides advice on developing and maintaining a healthy and safe workplace, but is not responsible for enforcing legislation. The committee recommends actions to management who has the authority to implement actions required to meet specified goals and objectives. The following list illustrates some important activities of the JOHSC:

- Hold regular meetings on a quarterly basis. Additional meetings may be held as required;
- · Identify workplace hazards and recommend corrective action(s);
- Respond to employee concerns regarding health and safety;
- Assist management in the development and implementation of safe work practices and emergency procedures;
- · Participate in workplace inspections;
- · Participate in incident investigations;
- Participate in resolving work refusals; and to
- Promote education and training.



#### 1.11 WORKPLACE INSPECTIONS

Documented monthly and annual HSE Inspection Reports serve as a valuable confirmation of due diligence, in that QEC is taking every precaution reasonable under the circumstances to protect employees and services. These Reports may be reviewed by the JOHSC and audited by the Regulatory Bodies upon request.

The purpose of this policy is to ensure that QEC complies with legislated health and safety requirements and to promote communication and develop procedures that improve workplace health and safety.

# PROCEDURE FOR MONTHLY/QUARTERLY PLANNED INSPECTIONS

All employees of QEC shall be vigilant and shall exercise appropriate due diligence to minimize risks. All workplace hazards must be reported to the immediate Supervisor for appropriate corrective action.

Monthly inspections of all the power plants are to be carried out by the Plant Superintendent or Assistant Operator in each community utilizing the QEC Supervisory Power Plant Inspection form HS9-02.

Quarterly inspections of all buildings shall be carried out by a Joint Occupational Health and Safety Committee member utilizing the JOHSC Inspection form HS9-03.

Prior to the inspection the Inspector(s) should:

- Review incident reports for the worksite they are inspecting;
- Review previous inspection reports for the worksite they are inspecting;
- Obtain and review building and/or floor plans for the buildings they are inspecting;
- Ensure they have an adequate supply of QEC Monthly Plant Safety Inspection forms;
- · Plan and review the inspection route; and
- Inform the Area Supervisor when the inspection will take place.

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# During the inspection the Inspector(s) should:

- Speak with workers and supervisors to gather any information regarding hazardous conditions or actions they may have knowledge of:
- Take the most recent copy of the Nunavut Safety Act and Regulations with them for reference purposes and to answer any questions that may arise out of the inspection;
- Examine areas where previous incidents or injuries have occurred and document conditions and any changes which have taken place since the incident or injury;
- Ensure that where chemicals are stored or used that they comply with WHMIS (Workplace Hazardous Material Information System) requirements (e.g. labeling, current MSDS etc.);
- Eliminate or remove the hazard if possible, keeping a written record of the hazard and any corrective actions taken and assign a rating for the hazards or potential hazard found as shown:
  - 1 Low hazard
  - 2 Medium hazard
  - 3 High Hazard
- Make a note of successes during the inspection; positive feedback encourages safe work practice.

# After the Inspection:

- The inspector(s) will review the finding of the inspection with the Manager or Supervisor to discuss the findings of the inspection;
- The inspector(s) will forward a copy of the Inspection report to the HSE Department;
- The area Manager or Department Head will complete a corrective action form for any items noted during the Inspection requiring corrective action which could not be addressed during the Inspection itself;
- The inspector (s) will ensure that items listed on the Inspection report
  which could not be corrected at the time of inspection will have
  accompanying explanatory information as to the reasons why the
  item could not be addressed; and



 The inspector(s) will review the Inspection Report with the Manager or Area Supervisor who is responsible for the completion of corrective action items.

#### ANNUAL HSE INSPECTIONS

Annual HSE inspection shall be conducted at all QEC power plants and office areas by a QEC HSE Department representative. These are detailed inspections that require more time than the monthly inspections, however, the same procedure is applied. The form that is utilized by the HSE department is form HS9-01.

# AREA OPERATIONS/MAINTENANCE SUPERVISORY INSPECTIONS

Area Operations/Maintenance Supervisors are required to perform a minimum of one HSE inspection per year. The form and procedure that is utilized for this inspection is the same one that is used for monthly/quarterly inspections (form HS9-02).

### UNPLANNED/INFORMAL INSPECTIONS

Unplanned/Informal inspections can be conducted without notice at any time in the workplace. They shall be conducted at random times throughout the year by the Plant Superintendent or Operator and/or the Area Supervisor. An inspection checklist does not need to be completed; however, the time and date of the inspection shall be recorded in the plant log book along with any deficiencies identified and corrective action taken. Items of a more serious nature shall be reported to the Area Supervisor. The inspection shall include:

- · Material handling and storage;
- · Hazardous conditions;
- · Compliance with housekeeping standards;
- · Safety equipment condition;
- · Compliance with relevant health and safety regulations;
- · Fire extinguisher conditions; and
- First aid stations.



### PRE-OPERATIONAL INSPECTIONS

Employees must be certain that no condition exists that might adversely affect their safety while working with tools and equipment, especially mobile equipment. One method of ensuring this prior to working with tools and equipment is by conducting a pre-operational inspection. If there are mechanical problems that could affect their safe operation, they must be reported and the equipment should be taken out of service immediately for repair. To prevent further use an "Out Of Service" Tag should be affixed to the equipment until the necessary repairs have been made as well as ones that are still required in the log book.

A pre-operational inspection checklist is required to be completed for mobile equipment that is used during field work. This includes boom and derrick trucks, bucket trucks, front end loaders, telehandlers, lift trucks and skid steers and any other equipment that could be in the field.

#### 1.12 EMERGENCY PREPAREDNESS AND RESPONSE

Qulliq Energy Corporation (QEC) is committed to protecting its staff, facilities and property from the effects of spontaneous, unpredictable crisis situations by establishing specific guidelines, procedures and resources for coping with local critical incidents, community emergencies and large scale disasters.

The QEC Emergency plans are designed to ensure continuity of essential functions while also maintaining the health and safety of our employees' and the community. This strategy is aimed at managing and recovering from situations or events that have a direct adverse impact on the operations of QEC.

QEC Emergency Plan applies to emergencies and threats such as:

- Natural disasters;
- · Technological or human caused hazards;
- · Material and emergency shortages; and
- Infrastructure failure.

The objectives of an emergency plan include:

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- · Eliminating or reducing loss of life;
- · Minimizing damage and losses;
- · Protecting people, facilities, equipment and other assets;
- Ensuring the continuous operations of all essential functions/operations during an emergency;
- · Reducing or mitigating disruptions to operations; and
- Achieving a timely and orderly recovery from an emergency and resumption of full service to customers.

There are many scenarios that could disrupt QEC operations and result in unavailability of power. A flexible approach is required to address the spectrum of threats shown on the following page.

- · Winter storms (wind, snow);
- Fires:
- · Equipment failures (prolonged power outages); and
- Hazardous materials spill

The events listed do not include all possible emergency situations. Emergency Plans should be reviewed by all parties to ensure that everyone understand their roles and responsibilities in the event of an emergency.

Emergency response plans include:

- Knowing what to do including pre-loss and post-loss activities;
- First aid;
- Public protection;
- Notification of authorities;
- · Availability communication with emergency responders; and
- · Medical aid beyond first aid.

Five phases in responding to an Emergency:

- Sounding the alarm;
- · Notifying the authorities;
- · Evacuation;
- Building re-entry; and
- Resuming services.

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**Sounding the alarm:** Depending on whether the building has a built in or manual alarm system, this is the initial phase in responding to an emergency. It notifies other occupants of the building to evacuate the premises.

Notifying the authorities: Once the alarm has been sounded, emergency responders must be notified to ensure a quick emergency response.

**Evacuation:** Knowing when to evacuate is a personal choice but if you can no longer control the hazard and/or your safety is at risk, then evacuate. Reminder if it is not safe for you to stay in the area it is not safe for anyone else therefore alert others working in the area to leave immediately. When an evacuation has been ordered:

- · Everyone must leave;
- · The Area Supervisor must be notified immediately;
- · Follow action plan for building re-entry and resuming services.

Building re-entry: Only after the authorities have given the okay to reenter. Area Supervisors and the Plant Superintendent will via phone identify what type of response is required to assist in the plant start-up.

Resuming Services: Area Supervisor and Plant Superintendent will work with the Director of Operations to ensure a safe and timely resumption of services. Each of the events that may impact QEC will vary by magnitude and severity and required different responses therefore the emergency response plans will vary from location to location and event to event.

# FIRE PROTECTION: Fire Extinguisher

Making the "Right" Decision to use a portable fire extinguisher:

- You are trained in the use of an extinguishers;
- You know what is burning;
- · Fire is not spreading rapidly;
- · Smoke and heat has not filled the area; and
- You have a clear path of escape.

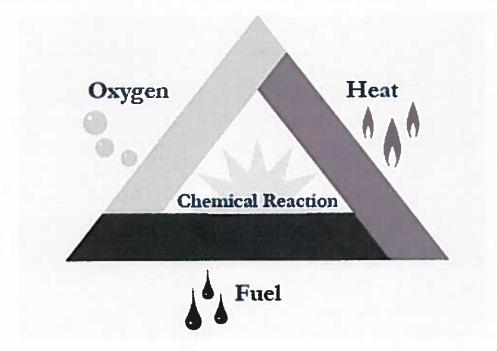


Fires can be very dangerous and you should always be certain that you will not endanger yourself or others when attempting to put out a fire. For this reason, when a fire is discovered:

- Assist any person in immediate danger to safety, if it can be accomplished without risk to you. Notify others close by.
- Notify the fire department (or designate someone else to notify them for you).
- Only after having done these two things, if the fire is small, you may attempt to use an extinguisher to put it out.

In order to understand how fire extinguishers work, you first need to know a little bit about fire; Four things must be present at the same time in order to produce fire:

- · Enough oxygen to sustain combustion,
- Enough heat to raise the material to its ignition temperature,
- · Some sort of fuel or combustible material, and
- · The chemical, exothermic reaction that is fire.



Essentially, fire extinguishers put out fire by taking away one or more elements of the fire triangle/tetrahedron.



Fire safety, at its most basic, is based upon the principle of keeping fuel sources and ignition sources separate.

Not all fuels are the same, and if you use the wrong type of fire extinguisher on the wrong type of fuel, you can, in fact, make matters worse. It is therefore very important to understand the five different classifications of fires.

Class A - Wood, paper, cloth, trash, plastics, solid combustible materials that are not metals.

Class B - Flammable liquids: gasoline, oil, grease, acetone, any non-metal in a liquid state, on fire.

Class C - Electrical: energized electrical equipment As long as it's "plugged in," it would be considered a class C fire.

Class D - Metals: potassium, sodium, aluminum, magnesium

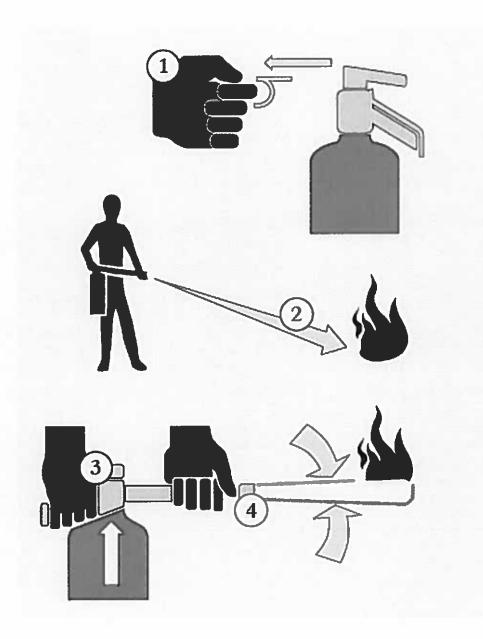
Class K – Kitchen: unsaturated cooking oils used in insulated cooking appliances in commercial kitchens.

Note: Typically we only have Classifications A, B, C hazards.



# How to use a Fire Extinguisher

Review the manufacturer' instructions for minimum and maximum distances when using an extinguisher (front of the extinguisher). Use the PASS method – Pull the pin, Aim the nozzle at the base of the fire, Squeeze the handle and Sweep side to side.





### **SPILL RESPONSE**

# Spill Response

QEC is committed to protect and enhance the environment of Nunavut.

We believe that the first line of defense in the protection of the health and safety of our employees, the community and the environment, must be the prevention of accidental escape of any contaminant. To this end, operating procedures are regularly updated and personnel are continuously trained to ensure for a safe and environmentally sound operation.

Always refer to the QEC Spill Contingency Plan for your community.

# **Initial Action Plan Summary**

# STEP 1 - Shut Off Sources of Spill

Locate and shut off the source of the spill.

# STEP 2 – Identify Product and Assess Hazards

- Identify the product.
- Tell everyone in the area that a spill has occurred.
- · Eliminate all sources of ignition. NO SMOKING
- Allow only emergency response personnel on site.
- Inform all personnel of hazards and ensure that proper PPE is used.

# STEP 3A - Initiate Spill Containment

- Determine who or what can be impacted by the spill then reduce or eliminate those effects.
- Determine the direction the spill is moving and how quickly. Determine what is causing the spill to move (wind, gravity, water, etc.).
- Determine where the spill can be contained with available staff and equipment. Initiate containment.
- Take all necessary steps to prevent the spill from contaminating any potable water sources or waterways.

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# STEP 3B - Report Spill

· Report the spill to your supervisor.

# STEP 4 - Clean-up and dispose

 Refer to the methods, materials and procedures in the QEC Spill Contingency Plan

#### STEP 5 - Debrief

 Communicate all information regarding the cause the course and effect of the spill.

# STEP 6 - Close spill file

Ensure all documentation and procedures are complete prior to closing.

### 1.13 INCIDENT REPORTING AND INVESTIGATION

Qulliq Energy Corporation (QEC) is committed to maintaining a workplace in which health and safety is part of everything the Corporation does and is as important as anything we do. One expression of our commitment to safety is this Incident Reporting and Investigation Policy.

# It is a QEC policy that:

- Incidents that did or could have resulted in injury, damage or loss shall be reported and investigated in a timely manner;
- Anyone required to conduct an Incident Investigation shall receive training on QECs Incident Investigation Procedure;
- The investigation shall identify root causes and contributing factors;
- The investigation shall determine corrective or preventive actions that shall be identified and implemented in order to prevent recurrence;
- All incidents shall be reviewed by the Joint Occupational Health and Safety Committee; and
- All incidents of a serious nature and work related injuries are reported to the appropriate department within the regulatory body.

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Qulliq Energy Corporation recognizes its obligation to ensure that all incidents and injuries are investigated, recorded and reported. The Corporation is committed to identifying corrective and preventative actions and implementing and reviewing them for effectiveness.

### REPORTING PROCEDURE

- Once an incident has occurred, the person involved shall (if possible) take
  whatever steps are necessary to control the hazard to prevent further
  incidents/injuries and seek any first aid/medical aid assistance that they
  need.
- The employee concerned shall notify their Manager or Supervisor as soon as possible after the event has occurred, keeping in mind the legal reporting requirements to WSCC as well. (Note: visitors and contractors shall be told who to contact if an incident occurs during the induction process).
- 3. The Manager or Supervisor shall confirm that whatever reasonably practicable steps are necessary to control the hazard in order to prevent further incidents/injuries have been taken. The HSE Department shall be informed once they become aware of any incident that has occurred, to allow appropriate statutory reporting to occur and to enable early intervention and return to work processes to commence.
- 4. Where appropriate, the Manager or Supervisor shall secure the scene of an incident to ensure accurate information can be obtained for investigation purposes.
- 5. For immediately reportable work-related injuries or dangerous occurrences the Manager or Supervisor shall ensure that:
  - a) The site where the injury occurred has not been altered;
  - b) Plant or equipment connected with the incident has not been reused, repaired or removed; and/or
  - c) Substances connected with the incident have not been reused or removed.



d) Once the scene has been secured and medical help provided, a QEC Incident Investigation Form must be filled out (form HS13-01) and submitted to the HSE Department and Area Supervisor or Manager.

### INCIDENTS INVOLVING CONTRACTORS

If a contractor working on a project for QEC is involved in an incident during the course of the project, the Area Operations Supervisor or Project Manager must be notified immediately and a completed investigation must be sent to the HSE Department within 24 hours, as per section 16 of Health and Safety Manual.

### INCIDENTS INVOLVING THE PUBLIC

If someone from the public is involved in an incident either on QEC property or with equipment owned by QEC (i.e. vehicle incident) the Immediate Supervisor must be notified immediately and a completed investigation must be sent to the HSE Department within 24 hours.

## **DEFINITION OF AN INCIDENT OF A SERIOUS NATURE:**

Section 35 of the Government of Nunavut General Safety Regulations states the following:

- 35. (1) In this section, "incident of a serious nature" includes:
  - (a) a major structural failure or collapse of a building, bridge, tower, crane, structure, scaffold, temporary construction support system or excavation;
  - (b) an uncontrolled spill or escape of a toxic or hazardous substance:
  - (c) an accidental contact with an energized electrical conductor;
  - (d) a premature or accidental detonation of explosives;
  - (e) a concussion, major blood loss, serious fracture, unconsciousness or amputation; and
  - (f) an incident involving heavy equipment.

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Workers' Safety and Compensation Commission of the Northwest Territories and Nunavut (WSCC)

# REPORTING REQUIREMENTS

Incident Type	Workers' Compensation Act	Safety Act: General Safety Regulations
Death	Within 3 days complete and submit WSCC Claim: Employers Report of Fatal Injury form	Immediately submit oral report to WSCC Chief Safety Officer
Incident Involving Serious Injury or Incident of a Serious Nature	Within 3 days complete and submit WSCC Claim: Employers Report of Injury form.  Worker completes and submits WSCC Claim: Workers Report of Injury form.	Within 24 hours submit written or oral report to WSCC Chief Safety Officer
Incident Involving a Non-Serious Injury	Within 3 days complete and submit WSCC Claim: Employers Report of Injury form.  Worker completes and submits WSCC Claim: Workers Report of Injury form.	Within 1 month submit incident report to WSCC Chief Safety Officer. Report must be signed by a First Aid Representative.
Incident with No Injury	No report required	See Incident of a Serious Nature above.



## INVESTIGATION PROCEDURE

Step 1: Take Immediate Action – 'Immediate action' may include:

- · Calling for help (e.g. fire department, ambulance);
- · Providing first aid/medical aid;
- · Taking immediate action to prevent further injury or damage;
- · Reassuring workers;
- Securing the incident scene until the investigation at the scene is finished; and/or
- Identifying potential information sources (people you can talk to, evidence you can look at).

**Step 2:** Gather Evidence. Gathering evidence helps you to gain a clear picture of what happens so that action can be taken to prevent similar incidents in the future.

When gathering evidence:

- Identify the final event of the incident (e.g. the incident itself);
- Gather data that fills in the complete picture of what happened from the beginning of the incident and determine what the contributing factors caused the incident to occur; and
- Ensure that the evidence is factual about actions that were seen, heard or done.
- Ways to gather evidence:
  - o Look for clues from the scene of the incident;
  - o Take pictures;
  - o Make sketches;
  - o Take measurements;
  - Note environmental conditions, housekeeping, lights, noise, signs, workspace;
  - o Collect foreign objects or broken pieces of equipment;
  - o Check procedures; and/or
  - o Collect information from people (e.g. injured worker, witnesses, supervisor).

**Step 3:** Put the Evidence in Order. To help you develop a mental picture of what happened, put all the facts that you have gathered together in the order in which they occurred. Make sure that you have enough evidence

and no gaps and that the evidence makes sense – each event relates to or interacts with at least one other incident event.

**Step 4:** Analyze your Information. Analyze your findings and identify why the incidents occurred; the "whys" are the safety problems that must have existed for the incident to occur. Incidents generally occur because of a combination of "direct" and "indirect" causes.

Direct causes are obvious, immediately recognizable problems such as no guarding on machinery or water on the floor. Direct safety issues need to be analyzed to find out why they exist. Indirect causes are "behind the scenes" problems. They deal with such things such as a lack of, or poor policy, procedures, training and supervision.

**Step 5:** Recommend Corrective Action. Look to see how the risk of similar incidents can be reduced. Use your knowledge of what happened and why and consider how "people" and "things" work together. Based on this information, recommend changes that will improve health and safety in the workplace.

Recommendations may be related to:

- · Policy/procedure revision or development;
- · Training;
- · Equipment repair, maintenance or replacement; and/or
- Supervision.

#### Recommendations must be:

- Specific for the identified safety problems fix what doesn't work;
- Effective and sound fix an existing problem without any new safety problem;
- Practical they are appropriate, sensible, and likely to be effective;
- Affordable are within available resources;
- Credible can be trusted to work; and
- Ranked according to priority. If not all recommendations can be carried out at once, identify which ones are most important.



**Step 6:** Follow Up on Corrective Action. Follow up your recommendations for corrective action to determine whether they were implemented and if so, whether they were effective. This information will help you when making recommendations on subsequent incident investigations. Without this follow-up, the effort on investigating may be wasted.

**Step 7:** Write an Investigation Report. Write a report to tell "those who need to know" what happened, why it happened and what can be done to prevent similar incidents. Your report should:

- · Be objective;
- Be descriptive (clearly state the sequence of events who, what, when, where, and how, so a reader with no knowledge of the incident will be able to understand what happened);
- · Identify safety problems why the incident happened;
- Make some recommendations for corrective action;
- · State planned follow-up dates; and
- · Leave space for follow-up comments.

#### 1.14 RETURN TO WORK PROGRAM

Qulliq Energy Corporation (QEC) supports safe practices in the early and safe Return to Work (RTW) of our injured/ill employees through adherence to both legislative and corporate requirements.

#### QEC will:

- Make every reasonable effort to provide suitable and available employment to every worker who is unable to perform their duties following a work related injury/illness in a timely and safe manner;
- Offer in accordance with the legislative requirements suitable work in returning an injured/ill worker. Only work that is considered to be meaningful and productive shall be considered for use in the RTW program; and
- Meet its obligation to an injured/ill worker by having an authorized representative contact the worker as soon as possible after the injury/illness to jointly work on developing a return to work plan. The return to work plan will be based on the individual needs of each worker and will incorporate all relevant information.



If an employee is unable to return to their pre-injury/illness position as a result of a work related injury/illness the Corporation will consider alternate options in accordance with the Worker's Compensation Act as well as Human Rights legislation.

All workers will be treated fairly and consistently and are expected to participate and cooperate in the RTW program. All managers/supervisors are expected to understand and value the importance of returning an injured/ill worker to work and must provide assistance where appropriate. Any personal information received or collected that can lead to the identification of an injured/ill worker will be held in the strictest confidence. Information of a personal nature will be released only if required by law or with the approval of the worker who will specify the nature of the information to be released and to whom it can be released.

The HSE department follows RTW guidelines similar to the one developed by the WSCC to ensure that all injured workers are treated fairly and consistently.

#### **RTW PLANNING**

A RTW plan lays out the steps that are to be taken to return an employee to their pre-injury/illness job. In the ideal situation, the plan is developed jointly by the injured/ill employee, the employee's supervisor, the Health and Safety Specialist and if applicable, Human Resources (who can coordinate the process), the worker's health care provider (through the provision of restrictions), and the union representative (if applicable). Supervisors from other areas, the medical department, or staff from the WSCC can assist in the process when the need arises.

The RTW planning process requires communication, advice and support, access to timely information, and the development, implementation and monitoring of a RTW plan.

 Goals – the goals of the plan are to accommodate the worker so that he/she may perform duties that are as close as possible to their preinjury/illness job. These goals are measurable and reviewed regularly and are set out as milestones for the worker to achieve until he/she reaches the final goal: a return to pre-injury/illness employment. If there is no goal there is no plan.

- Actions the actions required to achieve a successful return to work plan includes the responsibilities of the worker, the supervisor, or manager, and any co-workers who will be assisting the worker. Communication between all parties is essential.
- Schedule time frames for achieving goals. It is important that the plan has a beginning and an end, as graduated work is a means to achieve a return to pre-injury/illness work, and is not an end in itself. Regular review of the employee's progress provides a means to measure their progress. A clear definition of what is considered progress (e.g., the employee can work five hours a day by week three, or the worker can assume tasks by week five) must be outlined in the plan and updated in the progress reports. Each injury/illness and length of time for medical treatment must be considered when reviewing the progress and receiving updated information. All parties must not lose sight of the end goal: return to pre-injury/illness employment.

## RTW PROCEDURE

- A QEC Employee has sustained a work-related Lost Time Injury/Illness and has undergone the 'Incident Reporting (Injury)' process.
  - ➤ If the Medical Practitioner does not approve the Employee's participation in the RTW Program, the Employee will not return to work until clearance is given.
  - ➤ If the Medical Practitioner approves the Employee's participation in the RTW Program, then the Health & Safety Specialist initiates the process of assisting the Employee in returning to their regular duties.
- The Health & Safety Specialist submits a Physical Demands Analysis (PDA) of the Pre-Injury duties of the Employee to the Medical Practitioner.
- The Medical Practitioner reviews the PDA and advises the Health & Safety Specialist as to what duties the Employee is able to perform Post-Injury, and shift-length recommendations.
- The Health & Safety Specialist begins to develop the RTW Plan, unique to the Employee, which outlines work restrictions based on the PDA and Medical Practitioner's review.

- The Health & Safety Specialist reviews the RTW Plan with the Employee to ensure they understand the work restrictions stated therein.
- The Employee signs off on the RTW Plan, thus agreeing to the terms and conditions.
- The Health & Safety Specialist forwards a copy of the signed RTW Plan to their Supervisor and the Human Resources Department for the Employee's personnel file.
- The Health & Safety Specialist, Supervisor and Medical Practitioner monitor the progress of the Employee until clearance has been given for regular duties.
- The Health & Safety Specialist regularly submits progress reports to Human Resources until the Employee has returned to regular duties.

### 1.15 WORKPLACE VIOLENCE PREVENTION PROGRAM

Qulliq Energy Corporation (QEC) values the health and safety of its employees and expects that its workplaces will be free of workplace violence. The Corporation will not tolerate incidents of workplace violence perpetrated against or by any employee, customer, contractor, visitor or any other person at a Corporation workplace or involved in Corporation business.

#### **PROCEDURE**

- 1. All incidents of workplace violence or reprisal must be immediately reported to management and the HSE Department.
- Any person subjected to workplace violence should, where appropriate, go to a safe location at the workplace and report the incident to their supervisor or a Corporation supervisor and the HSE Department, so that the incident can be investigated and addressed.
- 3. All complaints and incidents are to be recorded in writing (see QEC Incident Investigation Form HS13-01) by the reporting person/employee, the supervisor receiving the report and the HSE Department. The date, time, location, potential witnesses and nature of the incident should be documented.
- 4. If the police have not previously been summoned, management or the HSE Department will report all physical assaults to police. All other

incidents or threats of workplace violence will be reported to the police as appropriate.

5. If an incident of workplace violence involves a person who is not an employee of the Corporation but who is involved in business with the Corporation (e.g. contractor employee working on behalf of QEC), Corporation management or the HSE Department will report the incident to that person's employer and/or such other person as the Corporation determines is appropriate in the circumstances.

#### 1.16 RECORDS AND STATISTICS

#### RECORDS

In order to recognize hazards and monitor the success of QEC's Health & Safety Program reports, records and other performance measures must be maintained and reviewed. Analysis of these reports will provide information regarding what elements of the entire program need attention and improvement, and will assist in the prevention of incidents and injuries. Maintaining records is also an essential component of ensuring that QEC is exercising due diligence. Below is a list of some of the safety-related documents that are retained:

- First Aid Records (at the first aid locations)
- WSCC Inspection Reports
- WSCC Claim Reports
- Medical Assessments
- · Fire Marshall Reports
- · Incident Investigation Reports
- Hazard Assessments and Project Management Plans
- Material Safety Data Sheet (at every location)
- Joint Occupational Safety Committee Minutes
- Plant Log Books
- Work Protection Permits
- Switching Orders
- Maintenance records (Maintenance Department/Regional Plant Offices)
- Training records (internal and third party)
- New Employee Orientations
- Contractor Safety Orientations

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- · Safe Work Practices and Standard Operating Procedures
- Inspection reports
- Safety Audits

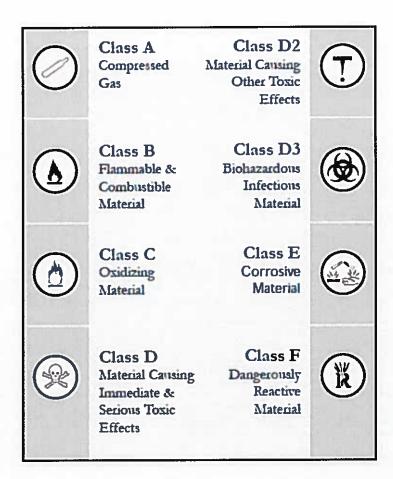
#### **1.17 WHMIS**

Workplace Hazardous Material Information System program is part of our Health and Safety Program and is in compliance with the WHMIS legislation.

Components of the program are:

- Material Safety Data Sheet (MSDS)
  - Hazardous materials in the workplace shall have a current MSDS's provided by the supplier. MSDS or Safety Data Sheet's (SDS) are available for worker reference on every employee's desktop computer via "QEC MSDS Online" software program.
  - o MSDS's shall be organized by storage location
  - The original MSDS sheets shall be available in the HSE Department.
- An inventory of hazardous chemicals is prepared and updated as required but not less than yearly. The inventory list contains the following information:
  - o Common name chemical name (major components);
  - Suppliers' name and address;
  - o Location where used and or stored; and
  - All storage and shipping containers shall be labeled in accordance with WHMIS/TDG regulations.
- Training All employees shall receive WHIMS training which covers:
  - Symbols and labels;
  - o MSDS's;
  - o Storage and handling; and
  - Emergency response procedures

Training shall be provided to all new employees; retraining shall be conducted every three years. Records of all WHMIS training shall be kept by HSE Department.





	Exploding bomb	(3)	Flame over circle
	Corrosion		Gas cylinder
3	Health hazard	<b>(1)</b>	Exclamation mark
<b>(N)</b>	Flame	<b>(L)</b>	Environment (not mandatory)
	Skull and crossbones	<b>(A)</b>	Biohazardous Infectious Materials

## 1.18 WORKING ALONE

#### Introduction

The Working Alone Policy and guidelines are intended to promote employee awareness and facilitate employee safety when they are working alone. The Corporation will ensure that there are safety plans in place for those who work alone. QEC will ensure, by applying all reasonable measures, the protection of all employees and contractors who are performing their duties in areas or under conditions where they are required to be on their own.

# **Policy**

Qulliq Energy Corporation (QEC) is committed to providing a healthy and safe work environment for its employees and contractors. Our belief is that workplace incidents, illnesses and injuries are unacceptable and preventable.

QEC will establish specific practices and procedures to minimize the risks of injury or violence to staff who, due to the nature of their work, are

required to work alone and may require emergency assistance during the course of working alone.

# Scope

This policy applies to all employees and contractors who work on QEC premises or those who may be required to work off site in a field capacity. Workers who are required to work alone may require assistance if they are exposed to conditions that may result in a job related injury, health impairment of any kind, victimization through criminal violence, or other adverse conditions.

Under no circumstances is a contractor to be left alone while performing work in a power plant.

#### **DEFINITIONS**

High Risk Activities: activities where the potential for the occurrence of incidents or injuries is deemed to be highly likely and where the severity of the injury or incident will bring serious consequences. High risk activities include but are not limited to the following:

- working from heights
- · working in confined spaces
- · working with electricity
- · working with/on hazardous equipment
- · working with hazardous substances or materials
- · working with material under high pressure
- · working where there is a possible threat of violence
- working in isolation from first aid services or immediate/emergency assistance

Low Risk Activities: Activities where the potential for the occurrence of incidents and injuries is deemed to be highly unlikely and where the severity of an incident or injury is generally thought not to have serious consequences.

Hazard/Risk Assessment: Individually and collectively, supervisors and workers are required to assess the conditions or circumstances under which an employee may be working alone to determine the risks, the level



of risk, and prevention measures required to reduce those identified risks to acceptable levels. A critical part of the risk assessment is the determination of emergency assistance procedures.

**Working Alone:** A person is considered to be alone when they are on their own, when they cannot be seen or heard by another person or when they cannot expect a visit from another person.

**Emergency Assistance:** a means of communication to gain assistance in the event of an emergency involving an incident or serious injury, illness, or threat of violence.

After Hours: the period of time when "normal" weekday or shift operations cease.

Field Work: Field work consists of work activities conducted outside QEC property.

#### **RESPONSIBILITES**

In order for the Working Alone policy, procedures and guidelines to be effective, they will be implemented with reason and diligence. To achieve this, respective responsibilities have been defined to ensure those who can positively impact on the potential risks of working alone are aware of their responsibilities and have the knowledge and skill to effectively implement working alone guidelines.

# Supervisor/Plant Superintendents

- Identify risks or hazards associated with the work to be performed or the environment where the work is to be done;
- Conduct and document a risk/hazard assessment for each different (specific) type of work or work location that can be deemed to be a working alone situation. This can also be accomplished by documenting the hazards and control measures of working alone during a tailboard meeting;
- Communicate the results of the risk assessment/tailboard to all affected workers and others conducting similar work;
- Develop effective methods of communication for those who require emergency assistance, depending on the specific work, location of



the work, and nature of the work. (For example: cell phones and radio). When electronic devices are not feasible, an effective contact system must be established (For example: check-in procedures and periodic site visits requiring worker to check in after the completion of specific tasks). The length of time a worker may be out of contact with a supervisor (the frequency of regular communications) must be based on the result from the risk assessment;

- Schedule potentially hazardous work for times when supervisors and appropriate help will be available; and
- Provide adequate staffing (for example: buddy system) for hazardous tasks performed at off-hours or remote locations.

#### Workers

- Participate in the working alone risk assessment/tailboard and risk management decisions with the supervisor;
- · Follow Safe Work Practices and Standard Operating Procedures; and
- Maintain regular communication as directed by supervisors/plant superintendents.

# **HSE Department**

- Monitor applicable legislation to ensure the Working Alone policy is up to date and incorporates any new or revised regulatory requirements;
- Provide consultation to supervisory staff in the development of departmental and site-specific working alone plans;
- Coordinate the development of department and site-specific working alone plans; and
- Audit to determine the effectiveness of the Working Alone Policy and guidelines within the Corporation.

## **WORKING ALONE GUIDELINES**

# **Working Alone Prohibited**

There are certain situations where working alone will not be permitted. Working alone will be prohibited under the following circumstances:

- · Confined space entry;
- · Working on energized electrical conductor or equipment;



- Power line hazards: Use of a vehicle, crane, or similar equipment near a live power line where it is possible for any part or the equipment or its load to make contact with the live power line;
- View obstruction: A vehicle, crane, mobile equipment, or similar material handling equipment where the operator does not have full view of the intended path of travel;
- · The use of fall arrest equipment, scaffolds and ladders;
- Quick-acting, acutely toxic material as described by the Material Safety Data Sheet;
- · Risk of drowning;
- Welding cutting and burning operations where a fire watcher is required;
- Tasks which, based on the risk assessment conducted by the supervisor in consultation with the employee, are deemed to require more than one person.

#### Communication

The Working Alone procedure shall include one or more of the following to ensure the most practical and effective means of communication:

- · Portable or cell telephone;
- Two-way radio;
- Buddy system;
- Periodic check-in system for updating an individual's status while working alone;
- Initial check-in, either by phone or email, as well as an update as to when the work was completed; or
- Any other method that may be considered most effective to the specific department's safe operations.

Each working alone scenario shall use these communication options, either singularly or in combination in the development of a site-specific working alone communication plan.



# **Conducting Working Alone Risk Assessments**

There are a number of scenarios within the work setting that call for jobs having working alone situations. It is essential that employees and their supervisors work together to develop Standard Operating Procedures. It is mandatory that the working conditions or circumstances that present high safety risks be assessed and identified on the tailboard meeting form so the probability of incident or injury can be minimized. Supervisors and employees will evaluate working alone assignments on a case-by-case basis and will consider the following risk factors for working alone:

- · Tasks and hazards involved in the work to be performed;
- Consequences resulting from a "worst case" scenario. This will be accomplished by asking the question, "What if?";
- · Likelihood for other persons to be in the area;
- Possibility that a critical injury or incident could prevent the employee from calling for help or leaving the workplace;
- · Emergency response time;
- · Worker's training and experience;
- · Worker's physical handicaps or any preexisting medical conditions;
- · Frequency of job supervision, if at all; and
- The time or shift when the job is to be done.

Supervisors/Plant Superintendents shall identify working alone requirements on the tailboard meeting document for the safety and security of person(s) working alone. Safety plans shall include:

- Identification of the risks or hazards associated with the work to be performed or the environment where the work is to be done;
- Procedures to eliminate or minimize the identified risks (e.g., buddy systems);
- Methods of communication by which the workers can secure emergency assistance and how emergency assistance will be provided in the event of incidents or accidents.
- The length of time a worker may be out of contact with a supervisor (i.e., the frequency of regular communications); and
- Confirmation where and when working alone is permitted.

Supervisors must review tailboards with affected employees with particular emphasis on Safe Work Practices and the provision of assistance to

employees at risk due to infrequent supervision, intermittent communication, or physical isolation.

### 1.19 FITNESS FOR DUTY

# **Drugs and alcohol**

You must not report or try to report for duty when you are unfit through drugs or alcohol.

#### You must not:

- Drink alcohol or take illegal drugs when on duty, or
- · Have any alcohol or illegal drugs on your person when you are on duty.

#### **Medical fitness**

- Don't attempt work for which you are mentally or physically unable to perform safely.
- If you have reason to believe that another worker is unfit for the work assigned you need to inform his/her supervisor immediately.
- If your health care provider restricts your work activities, you must work within the restrictions. If someone asks you to carry out a task that you cannot do because of your restriction, you must tell the person you cannot do it.

#### 1.20 SMOKE FREE WORKPLACE

Qulliq Energy Corporation is dedicated to providing a healthy, comfortable, and productive work environment for our employees.

Our Smoke Free Workplace policy covers the smoking of any tobacco product and the use of smokeless (or spit) tobacco. For more information see the complete policy posted in QEC workplaces.

Smoking is prohibited within all QEC-owned or leased buildings, properties and all company vehicles including rental vehicles used for company business.



- Smoking is prohibited within three meters of all building entrances, windows and ventilation systems.
- Additionally to discourage smoking around doorways, all ashtrays and garbage receptacles will be placed beyond the three meter limit.

Employees, visitors and customers will be informed of this policy through signs posted in buildings and vehicles.

The success of this program will depend on the thoughtfulness, consideration and cooperation of smokers and non-smokers. All of us share in the responsibility for adhering to and enforcing the policy.

Conforming to the policy will make our company compliant with Territorial Legislation. Any violations of Smoke Free Workplace policy will be handled through standard disciplinary procedures.

### 1.21 FIRST AID

Immediate first aid treatment shall be secured for every injury, however trivial it may appear.

Pre-planning for a potential emergency situation is most valuable. All workers should be aware of available medical services and how to obtain them.

#### First aid kits

Properly equipped and approved first aid kits, as per WSCC legislation, shall be inspected and maintained in:

- Vehicles
- Plants
- Offices
- · Transit housing
- Other locations as required

# First aid training

A list of all current certified first aiders will be posted on the HSE Board in each work location.

First aid training is offered to all employees of QEC.

#### 1.22 CUSTOMER SERVICE

Public relations and customer service are a key part of everything we do. How we answer the telephone, in greeting visitors, or in discussing our work effects how we are viewed as individuals and as a corporation. Our customers have needs and expectations for timely, error free work from us.

Here are some useful tips In order to help facilitate a positive interaction:

### Positive attitude and cheerful outlook

- Using respectful cultural names and respecting personal names
- Using humor
- Be sensitive

# Bridging the communication barrier

- Perception check and paraphrase periodically to make sure you and the other speaker understand what each other is saying
- Have someone interpret for you
- Make allowances for those who speak the language less fluently

# Genuine enjoyment working with and for other people

- Be friendly
- Be informed
- Be truthful
- Be interested

# **Dealing with Difficult Customers**

In your dealing with customers you can expect to encounter challenges at times. You will meet stubborn individuals who are tough to deal with. Some will appear unreasonable and in all fairness, some will be unreasonable.

Above all do not underestimate the people you meet. Appearance can sometimes be deceiving.

There are certain proven procedures for dealing effectively with people. As time goes on, you will become more proficient in the art of discussion. The better you are the fewer troubles you will have.

The main thing is DO NOT ARGUE! Arguments never get you anywhere except into trouble.

Here are some helpful tips:

- · Have a neat and clean appearance.
- · Be pleasant throughout your discussion.
- · Be efficient and accurate.
- · Avoid keeping the customer waiting unnecessarily.
- · Be courteous and respectful in manner and speech.
- Give individual attention to the customer, realizing that the problem is of the utmost importance to him/her.
- Let the customer state his/her case fully.
- Try to develop the ability to sense the customer's reaction and to use resourcefulness and quick thinking in order to meet the needs of the situation.
- · Give concise but clear answers to questions.
- Show interest in the customer as an individual.
- · Keep promises or give reason why you cannot.
- Develop a general knowledge of and confidence in the corporation's work polices.
- Use please and thank you.

Anytime you have a confrontation with a customer you should report it to your supervisor immediately.

# Hostile action by dogs

A recurring hazard that employees face particularly those who perform meter reading or disconnects is the action of dogs.

Employees and Area Supervisor are to be guided by the following when dealing with dog situations:

# **Employee**

If an employee is impeded in completing their job tasks by a dog he/she is to:

- If the owner is present, courteously request them to restrain the animal during the period of the work is to be performed.
- If it is impractical to attempt to contact the owner or if the owner is contacted and the dog remains unrestrained, make no further attempt to carry on with the work.
- Report the incident to your area supervisor, including the name and address and any action you have taken (all incidents should be reported to the area supervisor whether the dog owner appears cooperative or not on the initial encounter by completing an incident report form).
- All meter readers shall carry a dog deterrent device (i.e. dog dazer) in the event of an unknown dog encounter.
- In the event of an actual attack and an injury is received regardless of how slight, have it attended to immediately by the health center in the community.

# **Area Supervisor**

When an employee reports that the actions of a dog is impeding or preventing work performance the area supervisor is to:

- · Record the full particulars; and.
- Notify customer service, who will send out a letter to the customer.

# 1.23 TRAVEL

Various modes of transportation are used to enable us to perform our jobs including travel on foot, all-terrain vehicles (ATV's), snowmobiles, small aircraft/planes. Speak to your supervisor about safe work practices for different modes of transportation.

### Vehicle:

Before driving a vehicle you must have a valid Nunavut driver's license.

# **Good Driving Tips**

- Park so that you can drive away without backing up (pull through parking spots are best)
- · Wear your seatbelt
- · Park in non-congested areas
- · Be aware of your surroundings
- Monitor weather/road conditions
- Watch for traffic (snowmobiles, ATVs, pedestrians)
- Ensure that passengers are seated in vehicle at all times

## **Travel on Foot**

Uneven ground can be challenging and requires caution and awareness of surroundings, especially on ice or snow covered ground. Utilize ice grippers in addition to normal footwear in these snow covered, slippery conditions. Speak to your Supervisor to attain a pair if your job duties require you to work outside.

# All-Terrain Vehicles (ATV's)/Snowmobiles

ATV's/snowmobiles are designed to meet the challenge of travelling on rough or uneven ground/snow. The appropriate safety gear should always be worn including a helmet, gloves, goggles and sturdy boots. Never exceed the capacity of manufactures recommendations for passengers and the driver should be cognizant of other vehicles and pedestrians.

### **Air Travel**

Travel in Nunavut requires planning to ensure that you arrive where you want to and when you need to. If you are traveling on regular scheduled flights you will need to make sure you have completed the required travel request prior to your departure.

# **Baggage**

If you are traveling with tools or additional baggage make sure the airline will be able to accommodate.



If you are carrying "Dangerous Goods" you will need to ensure that it is packaged and label correctly with the proper documentation.

Check with the Plant Superintendent of the community where you are traveling to, then ask what you need to bring if you are staying in transit housing.

### Communication

When traveling stay in touch with your supervisor so they are aware of any delays or changes in you travel plans.

Your supervisor or his/her relief is your contact in an emergency.



#### SECTION II WORK PROTECTION CODE

## 2.1 UTILITY WORK PROTECTION CODE

The Utility Work Protection Code (WPC) is a set of principles, definitions, rules and procedures which are designed to provide a safe workplace.

The WPC is to be applied in all work situations where devices (i.e. switches to turn off power or valves to drain tanks, etc...) are placed in a position that provides safe working conditions.

By using the procedures and safe work practices outlined in the WPC, workers can ensure that:

- · All sources of energy are isolated and/or grounded; and
- · Equipment is de-energized.

The WPC does not eliminate all job hazards. It is only one part of a safe work practice. The objective of the WPC is to establish conditions which, when combined with appropriate work practices, procedures and work methods will provide employees with safe working conditions.

All WPC documentation shall be kept on site for a minimum of three years.

To fully understand how the WPC works you must understand the definitions of the WPC.

#### 2.2 **DEFINITIONS**

Alive – An object is alive when it can deliver energy. It can deliver energy when it is dynamically alive or charged.

**Dynamically alive** – A dynamically alive object is connected to a source of energy (it is not isolated). Examples of energy sources are: an electrical generator, a storage battery, an oil or water pump or an air receiver (tank).

Charged – A charged object is isolated but not de-energized. It contains stored energy. Examples of a charged object are: compressed spring (potential energy), charged electrical capacitor, suspended object (potential energy), object in motion (kinetic energy), electrical equipment not physically connected to a source of energy but near live electrical equipment (induction), or a tank or pipe containing substances at greater or less than atmospheric pressure.

## SECTION II WORK PROTECTION CODE

Approved Isolation Procedure (AIP) – An approved written procedure used for work that requires de-energization and isolation and/or grounding of energy sources to provide worker protection.

Approved Practice – A trade skill or work procedure used in a situation where isolation of energy sources is not used. Skills are developed from a combination of education, training and experience. Approved practices are normally documented in training material, trade handbooks or work methods instruction. Examples: live line procedures and troubleshooting live equipment.

Canceling Authority – Supervisor of the Permit Holder/Working Group who, under extenuating circumstances or as a result of unsafe activities may cancel the Permit.

Controlling/Issuing Authority (CIA) – A Qualified Worker approved by the Corporation who has responsibilities for:

- Controls of specific equipment and devices. This includes the responsibility for performing, directing or authorizing changes in the condition or in the position of the equipment or devices;
- Conditions requested by the Prospective Holder and ensures that those conditions have been established;
- Preparing, checking and establishing the conditions for a Permit or supporting guarantee; and
- Making effective and terminating the Permit or supporting guarantee.

**De-energized** – De-energizing must meet three objectives: prove isolation, remove any residual charged or stored energy; and ensure the equipment remains de-energized during the work.

In the electrical sense this shall mean when all of its electrical energy has been discharged through connection to an effective ground potential.

In the mechanical sense this shall mean all spring tension, liquid or gaseous, pressures are released and sources are opened.

Foreign Organization – Any organization outside Quiliq Energy Corporation.

Grounded – A conducting object, such as a wire, that is connected to such a position of zero energy potential.

Guaranteed Device – A de-energized, isolating and/or grounding device that has been locked/tagged to ensure worker safety.

High Voltage - Energized conductors greater than 750 volts.

Holder's Check of Isolation – A visual inspection by the Prospective Holder (or any Qualified Worker of the Work Group) to confirm a guaranteed device(s) is: the correct device(s); in the appropriate position (when possible); appropriately locked/tagged in accordance with the Permit. Check must be completed prior to receiving the Permit from the CIA.

**Isolated** – When equipment is separated from all sources of dynamic energy.

In the electrical sense this shall mean when separated by devices, the contacts of which are clearly visible. Electrical equipment is typically isolated by using devices such as: switches, whether three phase or single phase; draw out type breakers; disconnect jumpers or taps. Isolating devices shall be able to be locked and/or tagged.

In the mechanical sense this shall mean when separated by devices, the conditions of which are clearly verifiable.

Live Line Permit – A form of protection guarantee used for high voltage work. Formerly referred to as a Hold Off.

Lock – A mechanical means of locking that uses a keyed lock to secure an energy-isolating device in a position that prevents energizing of a machine, equipment, or process.

Low Voltage – Alternating or direct current with a potential of less than 751 volts.

Nominal Voltage – The normal operating voltage measured: phase to phase on multi-phase equipment, or phase to neutral on single phase equipment.

**Permit** – A written guarantee that a de-energized, isolated and/or grounded condition has been established and will continue to exist. It states that the WPC is in effect for the specific job and location outlined.

**Permit Holder** – The Qualified Worker who receives rights to work under the Permit. Is assigned responsibilities for ensuring that everyone in the Work Group is protected from the perspective of the WPC.

Permit Transfer – A Work Permit that is transferred to another Qualified Worker if in full concurrence with original Permit Holder's Work Group and the CIA. This transfer can be completed between two Qualified Workers however in extenuating situations must be authorized by the original Permit Holder's Supervisor, if original Permit Holder unavailable. Transfer must be documented on Permit Transfer Form WPC # 4.

Personal Protection – A procedure where a worker identifies intent to work underneath an existing Permit and subsequently installs lock(s) used to ensure isolation of guaranteed devices to ensure individual worker safety.

Plant Control Room – For the purposes of this document, designated work space for completing Permits and filing of all WPC documentation.

**Prospective Holder** – A Qualified Worker responsible for requesting a Permit from the CIA and for providing all information required to complete the Permit application.

Qualified Worker – A person who has met and maintained all current WPC training and qualifications and is judged by their supervisor to have demonstrated competency and familiarity with rules, procedures, equipment and hazards associated with the work.

Apprentices are eligible to become Qualified Workers after successful completion of second year trades school. A competency evaluation shall be completed by the Supervisor who will approve or deny Qualified Worker designation. Apprentices are permitted as Work Group Members until Qualified Worker status achieved.



Safe Work Area – A specifically identified area for work where all known hazards have been eliminated and/or controlled. Note: The WPC is only one part of a safe work area. A complete job plan is required for workers' safety.

Safe Work Procedures – Written procedures for carrying out specific tasks which, when followed, will ensure that workers' exposure to hazardous situations are minimized.

**Self Protection Permit** – A protection guarantee issued to a Qualified Worker that allows operation of one point of isolation to establish a safe work area.

Shall - Mandatory compliance is required.

**Surrender** – The relinquishing of guaranteed conditions by a Holder.

**Suspension** – The temporary relinquishment of working rights underneath a Work Permit while a Test Permit is in effect.

**Tag** – The physical indicator of a device position or status which represent the application of the WPC.

**Terminated** – The end of guaranteed conditions after a Permit Holder has surrendered their rights to a specific Permit. To be completed by the CIA.

**Test Permit** – A protection guarantee issued to a Qualified Worker under which specific work is authorized on specific apparatus. A test is done to check, prove or facilitate the work process; it is used in conjunction with a Work Permit.

**Work Groups** – A designated independent group performing work and/or tests under a Permit. At any given time the group must have only one "Holder".

**Work Group Member** – A worker who has successfully completed WPC Training and will perform work under the authorization of a Holder; shall not start work until authorized to do so, and will follow all instructions from the Holder.

Work Permit – A protection guarantee issued to a Qualified Worker, under which specified work is authorized on specific equipment by a Controlling/Issuing Authority. A Work Permit guarantees that the equipment being worked on is de-energized, isolated and/or grounded.

Work Protection Log (Form # WPC 5) – A form whereby all Permits are logged for record reference. This is kept in the Work Protection Binder located in the Control Room. Permit numbers will be assigned to every Permit as follows: Community Number – Year – Number (the number shall start with 01 and follow in numerical sequence as Permits are assigned). Example: 605-2013-01. Test Permits shall be indicated by brackets. Example: 605-2013-01 (1).

WPC - The Work Protection Code

#### 2.3 TRAINING

WPC training shall be mandatory at time of hire for those who the WPC applies and will be reviewed with workers every three years thereafter.

In addition to successful completion of WPC Training, a worker must meet all criteria as defined to achieve Qualified Worker status. The Supervisor shall advise the Health, Safety and Environment (HSE) Department in writing when competency and familiarity with rules, procedures, equipment and hazards associated with the work has been successfully demonstrated. Once all criteria established and documentation received, Qualified Worker status which enables the worker to become a Holder or Issuer of Permits shall be granted.

A list of Qualified Workers and Work Group Members shall be maintained. Master lists will be kept and updated as required, by the HSE Department for distribution to all plants. The Controlling/Issuing Authority (CIA) will refer to the listing to ensure workers are qualified before a permit is issued.



#### 2.4 SAFE WORK ENVIRONMENT USING THE WPC

#### Safe Work Conditions

The following methods can be combined to provide a safe working environment:

- · Hazards are identified;
- Hazards are controlled and/or eliminated;
- · Equipment is de-energized, isolated and/or grounded; and
- · Permit(s) are in effect.

#### **Boundaries of the Safe Work Area**

The Permit Holder and the Work Group must have a clear understanding of the:

- Isolated zone;
- · Location of the boundaries of the safe work area; and
- Proximity (and the potential hazard) of any live equipment adjacent to these boundaries.

It is critical that all parties understand the boundaries of the safe work area since the safety provided by a Permit only exists within the boundaries of the designated safe work area.

## Creating a Safe Work Area Using the WPC

The WPC uses a written contract called a Permit and locks/tags which:

- Identify equipment that will remain de-energized, isolated and/or grounded for a period of time set out in the contract;
- Guarantee that a de-energized, isolated and/or grounded state will be maintained on specific equipment with the exception of a Test Permit; and
- Guarantee that protection is issued to Qualified Worker(s), under which specified work is authorized on specific apparatus.

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#### 2.5 TYPES OF PERMITS

## There are specific types of Permits:

- · Work Permits;
- · Self Protection Permits:
- · Test Permits; and
- · Live Line Permits.

#### **Standards**

- A Permit must be obtained to work on any apparatus/equipment that requires the device to be de-energized, isolated and/or grounded to create a safe work area;
- · A Permit must apply to specific work or equipment;
- A Permit is not in effect and work may not start until a permit number is issued:
- Communication must be available between the CIA and the Permit Holder and must be checked periodically;
- Permits may be held open for an extended period of time with the Permit Holder being able to sign on and off the Permit; and
- · The Permit must be surrendered by the Permit Holder.

Note: In extenuating circumstances (illness, incident) the Permit may be surrendered by the Permit Holder's Supervisor in agreement with the Work Group and an incident report must be completed outlining the details of the occurrences. Also, in extreme circumstances the Permit may be transferred to another member of the Permit Holder's original work group if authorized by the original Permit Holder's Supervisor in agreement with the Work Group.

The Permit and supporting documentation must be logged in the Work Protection Code Log with the number and holders name.

### 2.6 CONTROLLING/ISSUING AUTHORITY

The CIA is a Qualified Worker who is responsible for the control of specific equipment and devices.



Examples of CIA would be:

- · Plant Operator;
- · Plant Superintendent; and
- · Assistant Operators.
- ❖ When operational requirements dictate, and two or more Qualified Workers are present, one may act as the CIA.

The responsibilities of the CIA include:

- · Ensuring that all aspects of WPC are adhered to
- Giving permission to work on equipment and to issue a Permit, ensuring that:
  - All documentation is complete and that all locks/tags are in place for:
    - Permits;
    - Switching Authorization/Equipment Lockout Procedure.
  - The equipment will remain de-energized, isolated and/or grounded for the duration of the Permit.
- · Communication with Permit Holder is in place.

A CIA can issue Permits as well as issue and hold another Permit at the same time for a different job function (i.e. Oil changes) while not affecting the safety and work of other Permits in place.

Test permits must be issued by the CIA.

#### 2.7 PERMIT HOLDER

The Permit Holder is the Qualified Worker, who may also be responsible for a Work Group under his/her direction, who has received permission to perform work and/or testing on equipment from the CIA.

The Permit Holder is responsible for ensuring that all safety procedures have been followed and that everyone in their Work Group is protected as per the requirements set out in the WPC.



#### 2.8 WORK PERMIT

A Work Permit is a protection guarantee issued to a Qualified Worker, under which specified work is authorized on specific equipment by a CIA.

A Work Permit guarantees that the equipment being worked on is deenergized, isolated and/or grounded.

#### **Standards**

- When a Work Permit is required for plant maintenance (i.e. Oil changes) the CIA shall be the Permit Holder.
- Any Work Group Member may become a member of a Permit Holder's Work Group.
- Only one Work Permit will be assigned to specific equipment in an approved work area. Isolation points can be used under more than one Work Permit.
- A Work Permit must be obtained to work on any apparatus/equipment that requires the device to be deenergized, isolated and/or grounded to create a safe work area.
- When preparing to take out a Work Permit the CIA must first determine the status of the equipment and whether there are any other Permits or supporting guarantees in effect on the equipment.
- A Work Permit must apply to specific work on specific apparatus.
  - o Only one Permit is used to cover all guaranteed devices for a particular job task.
- A Work Permit is not in effect and work may not be started until a Work Permit number is issued. Before the Work Permit is issued, a Switching Authorization/Equipment Lockout Procedure must be completed.
- Each Permit Holder is responsible for the safety of all persons working under his/her Work Permit.
- Communications must be available between the CIA and the Permit Holder(s) and periodically checked.
- A Work Permit must be surrendered by the Permit Holder (except under extenuating circumstances).
  - o The Work Permit only covers the members in the approved work group(s). Under no circumstances can a Work Permit be considered to protect anyone outside of the group.

 Work Permits must be logged in the Work Protection Log and all supporting documentation placed in the Work Protection Binder located in the Plant Control Room.

## **Procedures: Application for a Work Permit**

- · A Qualified Worker shall request a Work Permit from the CIA.
- The HSE Department shall provide master lists of Qualified Workers at all worksites which will require the use of the WPC. The CIA will refer to the listing to ensure workers are qualified before work is to commence.
- Upon requesting a Work Permit the following information must be supplied by the Qualified Worker:
  - o Name of Prospective Holder;
  - Specific apparatus/equipment to be covered by the Permit;
  - o Members of Working Group;
  - o Nature and location of work;
  - o Expected duration of work; and
  - Communication facilities, protocol and identification to be used.
- All above information is to be placed on the Application for Protection (Form # WPC 1A).
- Prepare the Switching Authorization/Equipment Lockout Procedure (Form # WPC 1B) for the Work Permit Application.

## **Making A Work Permit Effective**

The CIA will make the Permit effective by:

- Notifying all other working groups which may be affected by the Permit being put into effect;
- Verifying the completed Switching Authorization/Equipment Lockout Procedure (Form # WPC 1B). Once verified, the CIA will then physically lock/tag all devices as stated by the form and sign the completed by section.
- Completing the permit application and review the following with the Prospective Holder:
  - o Verification of de-energization points;
  - Verification of isolation points;

- o Verification of grounding points; and
- o Verification of lock/tag points.
- Assigning a permit number and log the permit number in the Work Protection Log;
- Notifying the Prospective Holder that the permit requested is now in effect and issues the Permit to the Permit Holder.
- Before work commences, all Work Group Members involved (excluding switching operations) must review the permit for that specific work permit number and sign into the Personal Protection Log (Form # WPC 2) that references the Work Permit number. Once signed onto the Personal Protection Log, the worker will then proceed to apply his/her personal lock to lockbox.

## **Surrendering the Work Permit**

When the Permit Holder wishes to surrender his/her Permit s/he shall:

- Ensure that all Personal Protection has been removed from lockbox and all workers have signed the Personal Protection Log as removed, with date and initials.
- Contact CIA and after identifying his/herself, surrender the Work Permit by signing and relinquishing the permit number.

When the Permit has been surrendered the CIA shall:

- Notify all other working groups which may be affected by the permit, that the permit is no longer in effect;
- The Permit Holder (where possible) completes Switching Authorization/Equipment Lockout Procedure (Form # WPC 1B) for energizing and returning to service. The form is then to be verified by the CIA. Once verified, the CIA will then remove locks/tags on all devices as stated by the form and sign the completed by section.
- Record surrender of Work Permit in the Work Protection Log and file all original documentation associated with the permit in the Work Protection Binder located in the Plant Control Room.



#### 2.9 SELF PROTECTION PERMIT

Self Protection is a permit that allows operation of one point of isolation to establish a safe work area. This permit shall only be used in distribution/transmission applications.

Self Protection guarantees that the state of equipment the Self Protection Holder is working on will not be changed without the holder's express permission. Under a Self Protection Permit, the Permit Holder is also permitted to be the CIA.

#### **Standards**

- Unless working under another form of permit, Self Protection must be in effect on any equipment which serves a distribution or transmission function;
- · Self Protection must apply to specific work on specific apparatus;
- There shall be no more than one Self Protection Permit on an isolation point at a time;
- A Qualified Worker invoking Self Protection is responsible for the safety of him/herself and members of his/her working group;
- Self Protection must be invoked and surrendered by the Self Protection Holder. No transfer of Self Protection is allowed. In extenuating circumstances, the Permit may be cancelled by the Cancelling Authority.
- · Self Protection must be kept at the worksite;
- Once surrendered, Self Protection must be logged in the Work Protection Log and supporting documentation placed in the Work Protection Binder located in the Plant Control Room.

# **Procedures: Application for a Self Protection Permit**

When a Self Protection Permit is required the Permit Holder shall also be the CIA.

Qualified Workers invoking Self Protection must:

- Complete the Application for Protection which requires the following information:
  - Name of Prospective Holder invoking Self Protection;
  - Specific equipment to be covered by Self Protection;
  - o Members of Working Group;

- o Isolation point;
- o Nature and location of work;
- o Expected duration of work; and
- o Communication facilities, protocol and identification to be used.

# **Making A Self Protection Permit Effective**

The CIA will make the Self Protection Permit effective by:

- · Contacting the Plant Control Room to retrieve permit number.
- Completing the Application for Protection while reviewing the location of all locks/tags and indicating the time that Self Protection is in effect to all work group members.
- Completing the necessary switching and grounding so as to deenergize, isolate and/or ground the required apparatus (no Switching Authorization/Equipment Lockout Procedure form is required for Self Protection);
- Attaching Self Protection tags to all appropriate devices (this tag must be applied to the apparatus with permit number);
- · Keep the Self Protection Permit at the worksite.

## Surrendering a Self Protection Permit

Before surrendering the Self Protection Permit, the CIA shall:

- Ensure working group which may be affected by the permit is clear of the apparatus;
- Ensure all equipment which may be affected by the permit is clear of the apparatus;
- Surrender the Self Protection Permit by removing all appropriate locks/tags, signing and relinquishing the permit number;
- · Restore the system to normal operating configuration; and
- Record surrender of Self Protection Permit in the Work Protection Log and file all original documentation associated with the permit in the Work Protection Binder located in the Plant Control Room.

#### 2.10 TEST PERMIT

A Test Permit is a protection guarantee issued to a Qualified Worker under which specific work is authorized on specific apparatus; it is used in conjunction with a Work Permit.

A Test Permit must be obtained to test any equipment with a generation, distribution or transmission function.

#### **Standards**

- Must apply to specific work on specific equipment(s);
- A Test Permit suspends the working rights underneath the Work Permit. No activity other than activity outlined in the Test Permit is permitted. This is to be communicated by the CIA to all workers within the Work Permit Working Group and the Test Permit Working Group;
- · Test Permit is not in effect until a test permit number is issued;
- Test Permit Holder is responsible for the safety of persons working under his/her Test Permit;
- A Test Permit enables the Permit Holder to remove permit grounds and energize the apparatus in order to perform tests;
- No testing is allowed without the permission of the Test Permit Holder, Work Permit Holder and the CIA;
- Only one Test Permit may be taken out on the same apparatus at one time. Test Permit applications shall have a clear description of the guaranteed devices that may be energized for testing purposes. Test Permits may never overlap;
- Once a Test Permit is in effect equipment is no longer considered a guaranteed device;
- No transfer of a Test Permit is allowed. In extenuating circumstances, the Permit may be cancelled by the Cancelling Authority.
- Communications must be available between the CIA and the Test Permit Holder; communications must be periodically checked;
- When the Permit Holder wishes to surrender the Test Permit, they shall inform the CIA that the test is complete and s/he can return the guaranteed devices to their previous state;
- While holding a Test Permit the Permit Holder shall remain at the work location:
- Test Permits must be logged in the Work Protection Log and all supporting documentation placed in the Work Protection Binder located in the Plant Control Room.

# **Procedures: Application for a Test Permit**

· Qualified Workers shall request a Test Permit from the CIA.

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- Upon requesting a Test Permit the following information must be supplied by the Qualified Worker:
  - o Name of Prospective Holder;
  - o Specific apparatus/equipment to be covered by the Permit;
  - o Members of Working Group;
  - List of all devices removed from locked out state as per Switching Authorization/Equipment Lockout Procedure completed for corresponding Work Permit;
  - o Nature and location of work.
- Before the Test Permit is in effect all activities under the adjacent
  Work Permit shall be suspended and to be communicated to all
  affected workers. All workers with Personal Protection on the devices
  stated under the Work Permit shall remove their lock(s) and sign as
  removed, with initial and date on the Personal Protection Log (Form
  WPC # 2).
- Once all locks have been removed the Test Permit can be issued to the Prospective Holder.

## **Making A Test Permit Effective**

The CIA will make the Test Permit effective by:

- Notifying all other operating groups which may be affected by the Test Permit that a Test Permit is being put into effect;
- Ensure that Personal Protection associated with the Work Permit is removed and documented on Personal Protection Log (Form WPC #2);
- Removing his/her Personal Protection and energizing the equipment identified in the Test Permit;
- Logging the Test Permit in the Work Protection Log and assign a number;
- Completing the Test Permit Application and review the conditions of the Test Permit with the Prospective Holder;
- Notifying the Prospective Holder that the Test Permit requested is now in effect and issue the Test Permit number;
- The responsibilities of the Test Permit Holder now includes the responsibility for removing Permit grounds if so required for testing purposes (if applicable); and
- The Test Permit shall be kept with the corresponding Work Permit.

## Surrendering a Test Permit

When the Test Permit Holder wishes to surrender their Test Permit they shall:

- Contact CIA and surrender the Test Permit by signing and relinquishing the Permit number.
- The Work Permit Holder may now surrender Work Permit if no other work is required.
- If work is to continue, the CIA shall re-establish conditions of the original Work Permit, as per completed Switching Authorization/Equipment Lockout Procedure (Form # WPC 1B).
- Personal Protection guidelines shall be re-established.

When the Test Permit has been surrendered and no other work is required the CIA shall:

- Notify all other working groups which may be affected by the Permit, that Permit is no longer in effect;
- Record final surrender of Work Permit in the Work Protection Log and file all original documentation associated with the Permit in the Work Protection Binder located in the Plant Control Room.

#### 2.11 PERSONAL PROTECTION

Personal protection is a protection guarantee that a worker invokes for his/her own personal safety. Personal protection guarantees that the state of the equipment which may affect the apparatus the worker is working on will not be changed without his/her expressed permission.

Under extenuating circumstances, Personal Protection removal may be completed by the worker's supervisor, if all reasonable attempts to contact the worker have been established.

Underneath a Work Permit, Personal Protection must be installed on the associated lockbox by all workers with the exception of switching operations. Underneath Work Permits involving switching operations and Live Line Permits, the Permit Holder must apply Personal Protection. If multiple Work Groups are working underneath the same Permit, pach Lead

Hand must also apply Personal Protection. Remaining Work Group Members can apply Personal Protection if they so choose.

Personal protection cannot be invoked underneath a Test Permit.

Before lock installation, workers must review Work Permit or Live Line Permit and sign on to the Personal Protection Log (Form # WPC 2). The temporary removal of Personal Protection will be required for testing purposes (if required). Prior to Work Permit's or Live Line Permit's surrender, workers must remove Personal Protection and complete Form # WPC 2.

#### 2.12 EQUIPMENT PROTECTION

There are procedures that are used that are for "operation restrictions" and must not be used to guarantee devices for workers' safety.

#### **Live Line Permit**

A Live Line Permit is a form of protection guarantee used for high voltage work. A Live Line Permit prevents the re-closing of breakers, re-closers, or others devices after an interruption.

Live Line Permit procedures restricts the operation of a device to its' previous state, except with the Live Line Permit Holder's consent. It is used to protect equipment only.

A Live Line Permit is never used in place of Work Protection.

#### **Standards**

- A Live Line Permit must be obtained to work on or near live apparatus.
- A Live Line Permit must apply to specific work on specific apparatus.
- A Live Line Permit is not in effect and work may not be started until a Live Line Permit number is issued.
- Communications must be available between the CIA and Live Line Permit Holder and periodically checked.

- Automatic reclosing devices must be turned off automatic and locked/tagged with a Live Line Permit tag indicating Live Line Permit number.
- Manual reclosing devices must be locked/tagged with a Live Line Permit tag indicating Live Line Permit number.
- No work is permitted on relays, control circuits, or other devices designed to trip apparatus covered by a Live Line Permit.
- Protection features must be in service on apparatus covered by a Live Line Permit.
- When a device is subject to a Live Line Permit it must never be reenergized without the expressed approval of the Live Line Permit Holder.
- While holding a Live Line Permit for a device, the Live Line Permit Holder must report any suspected loss of potential on that device or apparatus.
- A Live Line Permit does not prevent apparatus from being deenergized.
- A Live Line Permit must be surrendered by the Live Line Permit Holder. In extenuating circumstances and only with the full concurrence of all involved may a Live Line Permit be cancelled by a Cancelling Authority.
- If more than one Work Group requires Live Line protection on the same device or apparatus, all workers shall work underneath one Live Line Permit Holder who shall ensure Personal Protection is invoked for all Work Groups underneath the Permit.
- Live Line Permits must be logged in the Work Protection Log and all supporting documentation placed in the Work Protection Binder located in the Plant Control Room.

# **Procedures: Application for a Live Line Permit**

- Qualified Worker(s) request a Live Line Permit from the CIA.
- When requesting a Live Line Permit, the following information must be supplied:
  - Name of Prospective Holder;
  - o Specific apparatus/equipment to be covered by the Permit;
  - o Members of Working Group;
  - o Nature and location of work;
  - o Expected duration of work; and
  - o Communication facilities, protocol and identification to be sed.

- Prepare the Switching Authorization/Equipment Lockout Procedure (Form # WPC 1B) for the Live Line Permit Application.
- Inform all Work Group Members that Personal Protection may be installed by any worker wishing to invoke their own protection for the prospective Permit.

# Making a Live Line Permit Effective

The CIA will make the Live Line Permit effective by:

- · Arranging to have automatic/manual reclosing blocked;
- Having Live Line Permit locks/tags attached to all appropriate breaker or recloser controls, sectionalizing devices, supervisory control points and/or control room boards and monitors as per the completed Switching Authorization/Equipment Lockout Procedure. This locking/tagging will be installed by the CIA or his/her agent;
- Notifying all other working groups which may be affected by the Live Line Permit that a Live Line Permit is being put into effect;
- Logging the Live Line Permit in the Work Protection Log and assign a number;
- Completing the Live Line Permit Application and review the following with Live Line Permit Holder:
  - o Devices which have had the reclosing turned OFF, and
  - o Verification of lock/tag points.
- Notifying the Prospective Holder that the Live Line Permit requested is now in effect and issues the Live Line Permit number.
- Before work commences, the Live Line Permit Holder shall review the Permit for that specific Live Line Permit number and sign into the Personal Protection Log (Form # WPC 2) that references the Live Line Permit number. Once signed onto the Personal Protection Log, the worker will then proceed to apply his/her personal lock to lockbox. If multiple Work Groups are working underneath the same Permit, each Lead Hand must also review the Permit and apply Personal Protection.

# **Surrendering the Live Line Permit**

When the Live Line Permit Holder wishes to surrender their Live Line Permit they shall:

- Ensure that all Work Group Members and equipment involved in the work are clear of the apparatus;
- Ensure all Personal Protection has been removed from the lockbox;
- Contact the CIA and after identifying his/herself surrender the Live Line Permit by relinquishing the number, identifying the device and start time. The Permit Holder (where possible) completes Switching Authorization/Equipment Lockout Procedure (Form # WPC 1B) for energizing and returning to service.

When the Live Line Permit has been surrendered the CIA shall:

- Verify the completed Switching Authorization/Equipment Lockout Procedure. Once verified, the CIA will then remove locks/tags on all devices as stated by the form and sign the completed by section;
- · Arrange the necessary restoration of automatic/manual reclosing; and
- Record the surrender of Live Line Permit in the Work Protection Log and file all original documentation associated with the Live Line Permit in the Work Protection Binder located in the Plant Control Room.

## Action to be taken if a device under a Live Line Permit trips

When a device under Live Line Permit trips the CIA shall contact the Live Line Permit Holder and advise him/her that the device under the Live Line Permit has tripped and request permission to re-energize the apparatus (only upon the express, specific approval of the Live Line Permit Holder) or leave the device de-energized until the Live Line Permit Holder gives their expressed, specific approval to do so.

#### **Out of Service**

An **Out of Service** Tag is used to tag devices for equipment protection and worker safety. This procedure is used to control the operation of equipment.

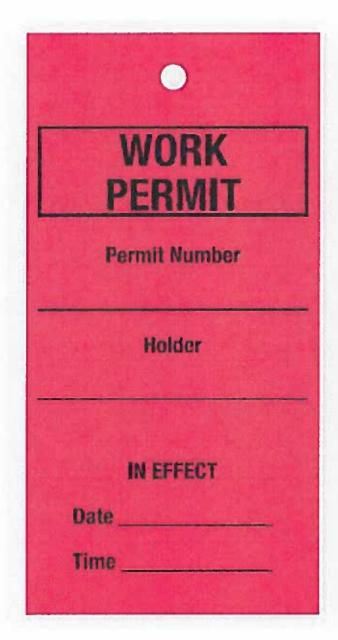
# Out of Service Tags shall contain:

- · Worker's name installing tag;
- Identify the reason for the placement on the tag itself and a brief description made in the plant log book; and
- Date and time the tag is in effect.

An Out of Service Tag can never be used in place of Work Protection.

A note shall also be placed in the plant log book stating information located on tag in addition to being logged in the Work Protection Log.

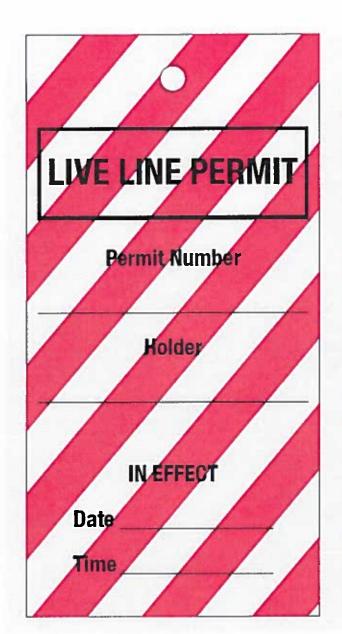
#### 2.13 WPC TAGS





**Work Permit Tag** 

H





**Live Line Permit Tag** 

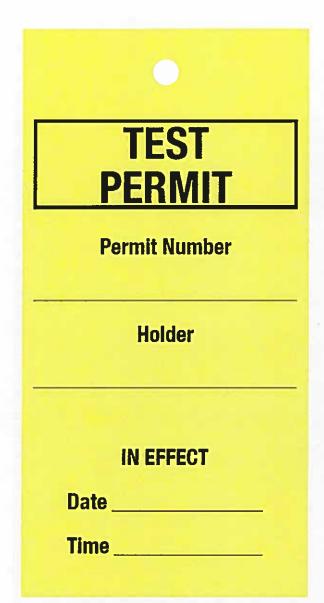


0
SELF PROTECTION
Permit Number
Holder
IN EFFECT
Date



**Self Protection Tag** 

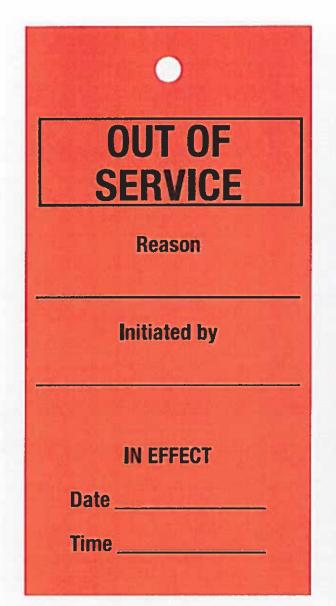
JK





**Test Permit Tag** 

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**Out of Service Tag** 



#### 2.14 APPLICABLE EXTERNAL REGULATIONS

Workers' Safety & Compensation Commission

# CONSOLIDATION OF GENERAL SAFETY REGULATIONS R.R.N.W.T. 1990,c.S-1

- **96.** (1) Work on electrical systems or near overhead electrical conductors must be carried out in accordance with the *Electrical Protection Act* and regulations under that Act.
- (2) Electrical conductors and equipment must be installed, maintained and used in conformity with the *Electrical Protection Act* and the regulations under that Act.
- 115. No person shall be permitted on a conveyor until it has been locked out.
- **141.** No person shall oil or adjust moving machinery if he or she could come into contact with moving parts.
- **142.** When machinery or equipment is shut down for maintenance or repairs, no work shall be carried out
  - (a) until parts, extensions and attachments have been secured against inadvertent movement;
  - (b) when the nature of the work exposes workers to mechanical hazards or harmful substances until the hazardous conditions have been removed; and
  - (c) until lock out procedures have been applied.
- 145. (1) A person who works on machinery or equipment is responsible for
  - (a) locking the control devices; and
  - (b) removing the lock on the completion of his or her work.
  - (2) Subsection (1) does not apply where systems are controlled by a central control operator.
  - (3) The operator shall lock out the central control and record the portion locked out and the time.
  - (4) The operator shall only re-energize the system on the instructions of the person who requested the de-energization.

- **146.** After lock out procedures have been applied, the affected machinery or equipment must be checked to ensure that it cannot be operated.
- 147. Locks must only be removed
  - (a) by the person or persons who installed them; or
  - (b) in an emergency, by a supervisor, who shall first ensure that the machinery or equipment can be operated safely.
- **148.** (1) For the purpose of these regulations, "control device" means, in the case of electrical controls, the switch or circuit breaker controlling the flow of current to the branch circuit that supplies power to the machinery or equipment.
- (2) The locking out of individual control buttons or switches on a console does not constitute compliance with these regulations.
- 149. (1) Only lock out procedures are acceptable.
- (2) Where circumstances render the application of lock out procedures impracticable, alternative proposals designed to provide equivalent protection to workers shall be submitted to the Chief Safety Officer for consideration and approval.



# 2.15 LIMITS OF APPROACH

Voltages	ertified sulated
Voltages O.H.S.A. Qualified Worker O.H.S.A. Insulated Booms  750 V to 0.8 Minimum Voltage O.H.S.A. Insulated Booms	
100 4 10	A.D.
13RV - 0.3HI	> 0.3m (1 ft.)
> 15 kV to 35 kV > 3.0m (3 ft.) 0.9m to 0.4 d in (3 ft.) > 3.0m >	> 0.45m
> 35 kV to (10 lt.) > 1.2m (2 lt.) (10 lt.) > 1.2m (4 lt.)	1.5 ft.)
30 10 10	> 0.9m (3 ft.)
	> 1.2m (4 ft.)
Control of the Contro	2.75m (9 ft.)

Diesel engines vary considerably from plant to plant but the principles of operation are similar. The Plant Superintendent and Operators are expected to operate the generating plant machinery in the safest and most economic manner. This involves making regular checks on all equipment and doing the day to day maintenance as required.

For more information on the operation of Diesel Power Plants refer to the Plant Operator Training Program Binder which can be found in the office of all power plants.

# 3.1 ROLES AND RESPONSIBILTIES: PLANT SUPERINTENDENT/OPERATOR

The Plant Superintendent/Operator are in charge and responsible for the plant. Anyone visiting or working in the plant must obtain permission to do anything in the plant.

The Plant Superintendent/Operator are responsible for:

- The safe and proper starting, running and stopping of the generators and diesel engines.
- Keeping the plant clean and ensuring that regular housekeeping is being done.
- Ensuring tailboards and any other safety documentations is completed.
- Act as the Controlling/Issuing Authority under the Work Protection Code.
- Familiarizing all visitors with your plant pointing out all site hazards and the safety procedures that must be followed.
- Ensuring that everyone is wearing the proper safety equipment.

When other workers (skill trades) are working in the plant they must get approval from the Plant Superintendent or Operator before beginning any work.

#### 3.2 PLANT VISITS

All workers, consultants, contractors and visitors upon entering QEC property shall report to the operator in charge to make their presence known.

- All workers, consultants, contractors and visitors while on QEC property shall conform to all rules and regulations pertaining to safety issues.
- No Visitors shall be permitted in the Control Room or Operating areas during periods of trouble or emergencies.

#### 3.3 CONTRACTORS

All Contractors who will be working on site need to have approval from the Area Supervisor.

An initial meeting shall be held between the QEC Plant Superintendent, Project Manager and the contractor to review all contract requirements related to Health and Safety, Environment, including but not limited to:

- Rules and procedures
- · Special permit requirements
- · QEC safety and health policies and rules
- Work site logistics

All contractors will be given a copy of the QEC Safety Rule Book. After reading the booklet they are to remove and sign the last page of the booklet and return to the Plant Superintendent who will keep it on file for the duration of the project. When the project is completed all signed forms will be sent to the Safety Department for filing.

The contractor shall keep a copy of the QEC Safety Rule Book on the job site for reference at all times.

If a contractor refuses to follow QEC safety rules and procedures he/she will be asked to leave the work site immediately. The Plant Superintendent will immediately inform their Area Supervisor, Project Manager and complete an Incident Report. The contractor will not be allowed back on the work site without the written permission of the Area Supervisor.

#### 3.4 PLANT SECURITY

NO ONE is allowed access to the plant without permission from the Plant Superintendent or Operator and visitors must be accompanied by a QEC employee.

The plant and the yard along with all storage areas are to be locked at all times when unmanned. The plant yard should be kept well lit.

#### 3.5 LOG BOOKS

It is crucial that all events that occur in a power plant are documented either electronically or manually. In addition to equipment rounds and automated data records, operators should also maintain other pertinent information in the form of a control room logbook (See page 2 of the Operator Training Manual for a complete list).

This chronological account should record the important events occurring throughout every work shift. Considered to have the force of a legal record, the correctness and detail of the information contained therein should reflect such consideration. The control room logbook is a valuable tool to others who must later chronicle important event sequences and verify past performance.

Log entries should be clear and accurate written statements with their corresponding dates and times. When possible, log entries should be recorded as the event occurs. Major routine events should be logged along with abnormal events affecting equipment status. Any incident or emergency should also be logged, taking care to document the initial indication, remedy actions, the cause and subsequent status. Log books should be maintained and stored after their use for future reference.

The Plant Superintendent/Operator is responsible for ensuring that the following information is recorded in the log book for each power plant:

- · Daily outside temperatures note extreme weather conditions;
- Daily adjustment for frequency clock changes;
- Fuel transfers;
- · Phone calls from customers;
- Every repair or maintenance activity performed, either by a QEC employee or contractor;
- · Times that the tank farm is checked;
- Any communication with Area Supervisor, corporate office or local/territorial officials;
- · Injury and incident investigations;
- Inspections and routine preventative maintenance such as filter changes and fluid top-ups;

- · Unusual load readings and power outages; and
- · Visitors on site and the purpose of the visit.

#### 3.6 STATION BATTERIES

Batteries are used to store electrical energy. However, the larger batteries found in the power plants can be dangerous and explode if used incorrectly.

- Appropriate signs shall be posted at stations.
- Caution shall be exercised to prevent electrical spark or open flames in the vicinity of lead acid batteries.
- Battery covers shall be kept clean and are not to be used as storage or work benches.
- Regular inspection of batteries and covers is to be done and noted in the plant log book.

#### 3.7 CONFINED SPACES

A work area shall be treated as a confined space if it is an enclosed or partially enclosed space having restricted access and egress and which, owing to its design, construction, location, atmosphere, the materials or substances in it or other conditions, is or may become immediately dangerous to the life or health of a worker required to enter it.

- No worker shall enter or work in a confined space without proper training.
- Approved QEC procedures and the Confined Space Code of Practice shall be followed for all confined space entry and work.

#### 3.8 FLOOR OPENINGS

- When working from catwalks, staging, open grates, or any elevated position, suitable covering shall be used over the work platform to prevent objects from dropping to a lower level.
- · Danger areas shall be barricaded and signs posted.



#### 3.9 CRANES

- No worker shall use a crane or hoist without proper training on that equipment.
- A log book shall be provided for each crane or hoist in a diesel plant.
- Overhead cranes and hoists shall be serviced every two years.
   Service shall be done by a certified inspector. Cranes and hoists shall be recertified by a qualified inspector following any structural repairs (such as alterations to rails)
- Approved QEC procedures shall be used for all lifting operations.

#### 3.10 COMPRESSED AIR

Compressor and air receivers shall have safety valves mounted on them and these shall be tested on an annual basis as per legislation.

Air compressors shall have moving parts guarded from both sides where practicable.

## 3.11 BURNING, CUTTING AND WELDING

Before approving any cutting or welding permits, the work area shall be inspected to confirm that precautions have been taken to prevent fire.

#### Permit

- Prior to any cutting and welding, a permit must be obtained from the Operator in charge via the control room.
- · Cutting and welding shall only be done by qualified persons.
- For any cutting and welding a fire watch must be provided as per the rules of the permit.

# **Equipment**

- Cylinders containing compressed gas shall be secured in an upright position.
- Proper welding curtains and blankets shall be used to prevent bystanders from receiving injuries.
- When cutting and welding equipment is not in use cylinders valves shall be closed and the pressure released.

- Flash arrestors shall be used on all oxygen/acetylene regulators and torches to prevent flashback in the hose and or regulator.
- Cylinders shall have the valve cap or valve protection device in place at all times except when in actual use.

## **Building**

• If welding is to be done inside building, proper ventilation shall be in place to handle the fumes.

#### Fire Watch

 Work area and adjacent area in which sparks and heat might have spread (including floors and above and below and on opposite sides of walls) must be inspected for at least 30 minutes after work is completed and found to be fire safe.

#### **Precautions**

- · Fire extinguishers are to be kept in the immediate area;
- · Floors swept clean of combustibles;
- · Wet down combustible floors prior to starting;
- Remove or cover with covers, guards, or metal shields all combustible material or flammable liquids;
- · Cover all wall and floor openings; and
- Covers suspended beneath work to collect sparks.

#### 3.12 TRANSFER OF DIESEL FUEL

# Purpose

The purpose of these procedures is to document the tasks and responsibilities related to the transfer of diesel fuel on QEC properties to ensure they are handled in a manner which minimizes the potential for spills, leaks and environmental damage.

This procedure applies to the proper transfer of diesel fuel to and from bulk storage systems throughout QEC (operational areas, plants, bulk fuel storage areas). There are two distinct procedures; one to handle transfers from tank to tank and another to handle transfers from truck to tank.

#### **Tank to Tank Fuel Transfer Procedures**

- Employees shall carry radio communication equipment that is fully operational and be in communication with each other during the transfer.
- Ensure both tank (dead storage and live tank) vents are fully opened.
   \*Live tank is the tank being filled\*
- Take opening dip reading from the live tank and record them first on paper then using the appropriate electronic tank dip sheet form. The tank dip sheet header names the Plant #, the tank #, and whether it is horizontal or vertical.
- Determine the amount of fuel in the live tank and how much fuel is required for a proper fill.
- Open the fill valve to the live tank.
- Walk the above ground fuel pipe line (in winter it may be buried in snow) between the tank farm and the live tank and check for leaks.
- Inspect the pump house for leaks.
- Dip the tank from which the fuel will be pumped record tank number and readings again using the appropriate electronic tank dip form.
- · Station one employee at the pump house and one at the live tank.
- · Open valves at the tank farm and pumping station and proceed to pump.
- Never leave your station during fuel transfer procedures. If you have to, stop pumping and shut the valves off accordingly.
- Dip each tank every hour and record readings.
- Should the high level alarm sound at the live tank, or it be filled to within 18", stop the pump.
- Shut off the valve at the pump house to the live tank.
- Shut off the valve to the tank farm at the pump(s).
- · Shut off the valve at the tank farm tank.
- Dip the tank farm tank and record the readings.
- Dip the live tank and record the readings.
- Ensure the dip hatches on both tanks are closed.
- Walk the above ground pipeline. Check for leaks and check all valve positions.
- Submit opening and closing dip reading to the Area Supervisor. Ensure the EC-00000xxx number of your fuel system is recorded on all documentation.
- If possible, have a third person with radio communication walking the above ground fuel line during the fuel transfer to observe any leaks while the line is pressurized.

Important\* It is a requirement to be in constant attendance to the transfer equipment at all times.

## **Truck to Tank Fuel Transfer Procedures**

- Walk the line from the truck fill point to the open fill valve at the tank.
- Ensure the valve at the fill point is closed; open the fill valve at the tank.
- Inspect the tank vent line, ensure there are no blockages.
- Check that the drip tray under the truck fill connection is fully drained and empty.
- Take opening dip reading from the live tank and record them first on paper then using the appropriate electronic tank dip sheet form. The tank dip sheet header names the Plant #, the tank #, and whether it is horizontal or vertical.
- Determine the amount of fuel in the tank and the amount required to fill it.
- Ensure that the truck static line is properly connected to the fill point piping.
- Ensure that the hose is properly connected to the truck fill point and locked. The truck fill point and hose connection shall be of the Camlock 'Quick Coupling' type with a dry disconnect.

Note: It is illegal to truck fill the storage tank from the top of the tank due to potential static electricity hazards.

- Establish visual communication signals by hand with the driver for the start and stop of the pump and make sure you understand each other.
- Open the fill valve at the truck fill point.
- · Authorize the truck driver to start pumping.
- During the pumping stage, walk the line to determine if there are any leaks in the filling system under pressure.
- Be in constant communication with the truck driver either visually or by radio at all times.
- Ensure that the tank is filled not more than 18" from the tank top to allow for volume expansion, or until the high level alarm is sounded if the tank is so equipped.
- · Signal the truck driver to stop pumping.
- Shut off the truck fill point valve and the tank fill valve.



- Ensure the EC-00000xxx number of your fuel system is recorded on all documentation including the fuel delivery slip. Sign the fuel delivery slip for the fuel received and obtain a copy.
- · Remove the static line.
- Empty the drip tray and clean it out.
- · Dip the fuel and record (closing).
- · Close the gauging hatch.
- Carry out the final inspection of the tank and the fuel pipe line. Ensure the proper valves are open and closed.

Important\* It is a requirement to be in constant attendance to the transfer equipment at all times.



### 4.1 QUALIFIED WORKERS

- Only qualified workers or workers in training under the continuous direction of a journeyman lineman shall be assigned to work on energized conductors or apparatus.
- Only qualified workers shall be permitted access to any enclosure, compartment or vault which contains energized cables or apparatus.
   Other workers requiring access to an energized area must be accompanied by an authorized person.
- Only qualified workers or workers in training under the continuous direction of journeymen lineman shall be assigned to work on energized cables or apparatus.

#### 4.2 LIMITS OF APPROACH

- The limits of approach were developed to allow workers to work safely in close proximity to electrical apparatus.
- The limits specified in the following table are the minimum requirements.
   To obtain the safest work environment, workers must maintain maximum clearance, and use equipment and procedures adequate to protect against electrical shock or burns.



ipment Certified
Loftified
Insulated A.D.
> 0.3m (1 ft.)
> 0.45m
(1.5 ft.)
> 0.9m (3 ft.)
> 1.2m (4 ft.)
> 2.75m (9 ft.)

### 4.3 HANDLING ENERGIZED CONDUCTORS

- Only qualified workers using Personal Protective Equipment shall handle live conductors.
- Workers shall not handle energized conductors which are part of an overhead system unless they use adequate protective devices and are suitably insulated from other conductors or grounded components such as cross arms, guy wires, lighting standards, etc.

### 4.4 EQUIPMENT CONSIDERED LIVE

- Electrical equipment and lines shall always be considered as live unless they are known to be DE-ENERGIZED, ISOLATED and/or GROUNDED.
- Before starting any work, a preliminary inspection and tests shall be made to determine existing conditions, using an approved potential testing device.
- Conductors designed to operate at ground potential may become energized by reason of faulty or inadequate connections, and therefore

shall be handled with similar caution as exercised when handling energized conductors.

### 4.5 RUBBER GLOVE WORK OVERHEAD - TO 25kV

- All protective equipment including rubber gloves used in work performed on voltages up to and including 25kV phase shall have a Class 3 rating.
   Class 2 rated rubber gloves can be used for up to 5kV.
- In rubber glove live line work all conductor or attachments that could create an electrical hazard shall be covered with protective equipment of the proper voltage rating.
- · Wherever practical work from below rather than from above.

### 4.6 RUBBER GLOVE WORK UNDERGROUND – TO 25kV

- Rubber gloves with a Class 3 rating and with appropriate leather
  protectors shall be worn before opening doors or gates, removing covers
  or panels to enclosures or compartments that will expose energized
  conductors within falling or reaching distance.
- Rubber gloves shall be worn continuously while work is being performed in the enclosures or compartments until:
  - The covers or panels have been replaced and the gates or doors closed and locked.
  - o The conductors are DE-ENERGIZED and the work made safe.

# 4.7 WORKING ON CABLES AND APPARATUS - TO 25kV

- Rubber protective equipment and or approved barriers shall be placed to eliminate the possibility of unintentional contact with exposed conductors.
- Protective equipment installed directly on energized apparatus above 750 volts shall be placed in position of cables or apparatus on which work is to be performed.
- Approved procedures shall be followed to ensure positive identification of cables or apparatus on which work is to be performed.
- No work shall be carried out on de-energized underground conductors until the work area has been made safe using adequate barriers or protective covering to prevent accidental contact with adjacent energized conductors.
- Moving energized cables:

- Energized cables shall be moved by qualified workers with extreme care to avoid damage to cable insulation.
- o When moving cables energized up to 25kV phase to phase, rubber gloves with a minimum Class 3 rating shall be worn.
- During work at locations where energized separable connectors are installed, workers shall ensure that except for approved switching operations, no physical pressure is applied to a cable or separable connector that will cause any movement, distortion or dislocation of the connector.

#### 4.8 FERRORESONANCE

- In a circuit inductive reactance and capacitive reactance are matched (equal), an abnormally high voltage may result.
- This situation may exist where a three phase wye system, feeding an unloaded three phase transformer through shielded cable, is switched at a riser pole.
- With one phase open, this cable constitutes a capacitor in series with the unloaded transformer coils.
- If this combination of capacitive and inductive reactance is capable of series resonance, ferroresonance may take place. A violent arc could develop at the switch point during switching operations due to the abnormally high voltage rise which could be well in excess of the Basic Impulse Level of the switch gear.
- Protective equipment is a must during all switching operations and would prove even more beneficial if/when exposed to the preceding situation.

#### 4.9 PULLING CABLE

- Cables shall not be pulled into vaults or maintenance holes containing energized apparatus until a safe work area has been established.
- Ducts shall be fished or cables pulled in the direction which presents the least hazard.
- Precautions shall be taken when compressed air or other mechanical means are used.
- Workers shall remain outside maintenance holes for vaults when cables are being pulled by mechanical means from outside the enclosure and tension is applied to the pulling rope or cable, except for training cables into position.

### 4.10 CARE OF PROTECTIVE EQUIPMENT

- Rubber and fiber protective equipment shall be laboratory tested at least every 12 months or more, should this equipment become suspect.
- To minimize corona and ozone damage, rubber protective equipment shall not be allowed to remain in place on energized lines any longer than absolutely necessary.
- Booms of aerial devices, jibs, buckets and lines used on or in the vicinity of live lines shall be electrically insulated while component is altered, changed or repaired.

## **Switching Operation**

- Workers shall wear rubber gloves with leather protectors during switching operations (except when opening cutout switches while using an approved live line switch stick).
- Approved live line switch sticks or live line clamp sticks of sufficient length to maintain a safe working distance from live apparatus shall be used in switching operations.
- Portable ground gradient control mats shall be used when performing the following operations:
  - o Operating air break switches, load interrupters, load break switches;
  - o Operating motor operated switches by hand.

# 4.11 LIVE LINE WORK

- Live line work shall only be performed where practical and when deemed necessary.
- Live line operations shall be carried out under the protection of a Live Line Permit.
- The supervisor or person in charge shall:
  - o Hold documented tailboards and advise of any hazards.
  - Ensure that the work is carried out under the supervision of a person competent in the work being performed.
  - Be responsible for ensuring that live line tools and equipment are electrically tested at least every two years and for keeping the records on file.
- Workers shall not use live line tools on energized lines or equipment unless they have been instructed in the proper use of these tools.
- At least two qualified workers shall perform work on energized lines or equipment using live line tools.

- When two journey persons are working on energized high voltage lines or apparatus they shall both work from the same pole boom structure or aerial lift and confine themselves to working on the same phase conductor or task at hand.
- When live line tool work is in progress, no other work shall be carried out on the pole or the structure.
- · Live line tools shall:
  - o Be regularly maintained and cared for in a manner to preserve their insulating qualities.
  - o Not be altered or repaired except by those authorized.
  - Be kept free from dust/moisture and under no circumstances be laid directly on the ground.
  - o Always be raised and lowered by means of a hand line.

#### 4.12 COVERED CONDUCTORS - INSULATION

Workers shall not depend on conductor covering for personal protection.
 All conductors shall be considered as bare conductors as far as personal protection is concerned.

### 4.13 CLIMBING AND WORKING ALOFT

- · Workers shall not wear climbing spurs while:
  - o Driving vehicles
  - o Doing work on the ground
  - o On ladders
  - o In aerial buckets
  - o On platforms
- The length of the gaffs on climbing spurs shall not be less than 2.17 centimeters (1 ¼ inches) measured on the inside of the gaff.
- Workers shall not climb or work aloft on poles or structures or in an aerial device without first being secured through the use of a suitable fall arresting device (belt on ground to ground) with pole chocker device.
- The pole strap snaps must be checked for full engagement with the belt in the "D" rings before entrusting the strap.
- Suitable work clothes, including a long sleeved shirt or jacket extending to the wrists shall be worn when working aloft (FR Rated).
- All tools and materials shall be passed to workers working aloft by means of tool bags or hand lines and under no circumstances shall anything be thrown from the structure to the ground or from workers.

Tools and materials shall not be laid on cross arms or ladder or in other places or positions from which they may fall.

- All poles shall be carefully inspected before climbing to ensure the poles are in safe condition for the work to be performed.
- If the condition of the pole is in doubt or if mechanical stresses or strains on the pole are to be changed it shall be adequately guyed or supported by a radial boom derrick or other suitable means before climbing.
- Under no circumstances shall pike poles be used to support a pole where workers are required to work above them.
- When two workers are to work in the same pole the second person must not begin to climb until the first person is in position. Extreme care shall be taken when working above or climbing past another worker.
- Every precaution shall be taken to avoid weather cracks, knots, metal signs, ground wires, etc. which could cause spurs to kick out. Both hands must be available for climbing. The use of the pins, brackets, cross arm braces or other attachments for hand holds shall be avoided.
- Care shall be exercised to avoid standing or placing weight on pole attachments.
- Handlines shall be kept clean and dry to prevent leakage currents which could cause a shock hazard when working in the proximity of energized equipment and apparatus.
- · Never perform live line rubber glove work while working from the pole.
- Handlines must be able to pull clear of a climber's belt in the event of an
  unusual down pull. Accordingly, handlines shall never be attached to the
  climber's body belt by the use of the snap hooks or tied knots, etc. Upon
  reaching the working position a worker shall remove the handline from
  the belt and attach it to the structure in an approved manner. Workers
  on the ground must be constantly on the alert to keep handlines clear of
  any snagging situations especially in the vicinity of vehicular traffic.

#### 4.14 GROUND WORK

- Work shall not be carried out on the ground that would present a hazard to workers working aloft e.g. installation of ground rods, ground wire molding use of tamping bars, pulling of guy wires, etc.
- No work, other than those necessary to carrying out of the work aloft shall be permitted in the immediate vicinity of a pole or structure due to the hazard of falling objects.
- It is the responsibility of the person working on the ground to remain alert at all times.

#### 4.15 POTENTIAL TESTING

- Only approved devices shall be used to test for electrical potential.
- All voltmeters, multimeters and phase rotation indicators rated to 750 volts A.C. shall be equipped with fused leads (CAT III or better), or be otherwise suitably protected.

#### 4.16 GROUNDING

- For work on overhead lines, approved equipment bonding and grounding methods shall be used.
- Grounding devices of adequate current carrying capacity shall be placed on conductors between the work locations and all possible sources of electrical energy.
- Grounding devices shall be installed with a live line tool only after potential tests have been completed.

#### 4.17 BACKFEEDS

- In a three phase system with three phase transformers or single phase transformers banked together should one or two of the phases be opened for whatever reason a back feed on the open phase or phases may be encountered.
- This backfeed voltage under certain conditions maybe considerable higher than normal phase to ground voltage.
- In the case of the two phase system a similar situation could exist when a single phase is opened.
- It is imperative that personnel who could be exposed to a backfeed hazard are made fully aware of the possibility as well as the procedures and protective equipment to be implemented to ensure a safe work environment.

# 4.18 BOOMS, CABLES AND CONDUCTIVE MATERIAL

- Steel cable slings or metal booms shall not be used to raise transformers, poles or material in the proximity of high voltage lines.
- Boom trucks used for hoisting shall be operated within the manufacturer's safe load limits and limits of approach.



### 4.19 STRINGING AND REMOVING CONDUCTORS

- During stringing operations in proximity to energized conductors, proper ground techniques shall be employed.
- When conductors are strung or removed over streets or thoroughfares where there is danger of the conductors interfering with or falling into traffic, workers equipped with warning devices and or barricades shall be stationed at suitable locations.
- When stringing or removing conductors from above, below or beside unattached circuits or circuits supported on poles or tower, precautions shall be taken to adequately protect workers. Rubber protective equipment is used when conductors are being handled so that no harm will occur if the conductor should accidently contact energized conductors. Workers attending the reel shall wear rubber gloves and keep all parts of their body free from contact with the conductor.
- Unless radio equipment is used, a sufficient number of workers shall be stationed so hand signals can be read, relayed and understood clearly.
- When stringing or removing conductors crossing energized lines suitable guard structures or insulated guards shall be installed at the point of crossing in order to eliminate the possibility of accidental contact.
- Workers involved in stringing operations shall stay clear of the bright ropes of conductors under tension.

### 4.20 TENSION STRINGING

- Workers operating tensioning equipment shall be familiar with the equipment and competent in its operations.
- During tension stringing operations in proximity to energized conductors, tensioning equipment shall be properly grounded and completely surrounded by a bonded ground gradient control mat and protected by a full barricade.
- In addition to the above, bare conductors being strung under tension shall be grounded at various locations along the length of the conductor by the use of traveling ground.

### 4.21 POLE HANDLING AND TRANSPORTATION

 Only approved methods, tools and equipment shall be employed during pole handling operations.

 Workers and equipment shall be positioned to minimize danger of injury or damage should control of a pole or poles be lost.

### The person in charge shall direct the handling of poles:

- · One worker will give the standard signals.
- Poles shall be handled from the end of the pile.
- · Workers shall not needlessly climb on the pole pile.
- Poles shall be rolled away from the workers using ropers or cant hooks. Do not catch poles with cant hooks while the poles are in motion.
- Web hoists and rope blocks suitable for use on energized conductors shall be maintained as live line tools.
- Web hoists and rope blocks shall not be considered as fully insulated on voltages in excess of 750 volts phase to phase and shall be used in conjunction with link sticks or other approved live line tools.

#### 4.22 AERIAL DEVICES

- Aerial devices shall be operated with the limitations of the manufactures' specifications.
- The truck shall not be moved while the ladder or aerial device is aloft. In the case of aerial ladders, the position of the ladder shall not be changed while the worker is aloft.
- Only one worker shall work from an aerial ladder.
- When a worker is aloft in an aerial device, a second worker competent to effect a rescue shall be available on the ground unless a controlled descent device is available in the bucket.
- When working from an aerial ladder or other aerial device, the worker shall wear a suitable fall arresting device and lanyard securely fastened to the ladder or to an approved attachment on the aerial device.
- When a worker is aloft in an aerial device a rope of sufficient length shall be carried to raise a rescue rope or controlled descent device if required.
- Only dielectrically tested insulated aerial devices shall be used for live line work at more than 750 volts phase to phase.
- When handling preservative treated poles, take precautions to avoid skin contact; take particular care not to rub the eyes or wipe perspiration from your eyes or face with your hands or with your shirt sleeves that have been exposed to preservative.

- Rubber gloves with leather protectors shall be used when handling poles that will be coming within the proximity of either energized or isolated conductors or apparatus over 750 volts.
- Pole piles shall be made stable by the use of the chocks or secure ties on each layer of poles.
- Workers shall not ride on piles of poles, trailers or dollies.
- Any load which overhangs the rear of the vehicle to the extent of 1.5
  metres or more shall display at the extreme rear end of the overhanging
  load a red flag during daylight and a red light between dusk and dawn.

#### 4.23 RACHET HOIST AND ROPE BLOCKS

- Metal ratchet hoist shall not be used on or near energized conductors.
- Aerial devices shall be dielectrically tested at least every 12 months or whenever any electrically insulated component is altered, changed or repaired.
- The electrical testing of aerial ladder devices shall be in accordance with the CSA Standard Vehicle Mounted Aerial Devices.
- Aerial devices used to raise workers aloft for live line work at more than 750 volts phase to phase shall be equipped with upper and lower controls. Lower controls shall be capable of positively over riding upper controls.
- During live line work from an aerial device (other than switching) on circuits energized at more than 750 volts phase to phase a second worker shall be available to render assistance from the ground.
- Bucket liners shall be used in buckets of an aerial device when engaged in rubber glove live line work at more than 750 volts phase to phase.
- Prior to commencing live line work booms shall be cleaned and inspected.
- During rubber glove live line work, the booms of radial booms derricks with boom and bucket attachments shall be extended to such distance that will eliminate possibility of shunting out (bridging) the insulated portion of the boom (preferably full extended).
- Workers shall not be allowed to remain in the bucket of an aerial device during emergency lowering operations when pressure on the hydraulic system is manually released.
- Workers shall not ride in the bucket while the truck is traveling.

- Exception: if the bucket is always returned to the cradled position for each move, workers may ride in the bucket for short moves at the work location.
- All aerial device vehicles shall be equipped with wheel chocks or outriggers. When aerial devices are in use wheel chocks or outriggers shall be used/deployed to prevent inadvertent vehicle movement.



#### **5.1 STORES AND WAREHOUSE AREAS**

A safe, orderly and efficient stores/warehouse is an essential part of the way goods are sent, received, stored and circulated throughout the corporation.

#### **General Hazards**

Consider some of the general types of hazards that may be encountered in a warehouse:

- · Slips, trips, and falls.
  - When you carry and move materials on different levels, and on different types of floor surfaces, it's easy to lose your balance or stumble over an out-of-place item.
- · Hit by falling objects.
  - o Items that aren't carefully stacked on floors, shelves, and other surfaces can fall on a head, a body, or a foot.
- · Placing items in storage—or removing them.
  - o A slip or fumble can send those items flying.
- Warehouse equipment can also pose hazards.
  - Motor vehicles, hand trucks, ladders can all cause incidents or injuries.
- Even equipment as seemingly simple that we use to load, pack, and unpack can cause injuries.
- Skids, pallets, rope, and strapping can be dangerous to workers who aren't wearing gloves; they may be hurt by splinters or loose nails.
- Carelessly placed empty skids or pallets can be hazardous, too—especially if you're the one who bumps into or trips over them.
- Rope can be hazardous if it breaks while in use. Another potential hazard is an extended rope that's pulled tight. A break or sudden release can whip anyone in the vicinity quite painfully.
- · Materials stored in a warehouse can also pose dangers.
  - o Hazardous substances or flammable or combustible materials can be both physically harmful as well as affect health.
- · Manual lifting is a major potential source of back injuries.
  - o If you don't lift properly, you can hurt your back and struggle with a load that's too high or unbalanced to move easily. Then you're at risk not just of back injuries but of tripping or bumping into things.

# **Safe Storage Practices**

Safe storage is more than keeping everything in its proper place, it includes checking what you're storing to determine if it needs certain conditions—dry, dark, ventilated, etc. It also means placing items safely so people won't bump into them causing the item to come tumbling down and landing on someone. We also, have to be able to remove stored items easily when we need them. Here are some general guidelines to keep in mind when placing any materials in storage:

- · Check that shelves and racks are sturdy and in good condition.
- · Stack all materials on a flat base.
- Place heavier objects close to the floor, lighter/smaller objects higher.
- Don't stack items so high that they could block sprinklers or come in contact with overhead lights or pipes.
- Use material handling equipment or stand on a ladder to place or remove items above your head. Never stand on a shelf or rack or on boxes or a chair.
- Certain items need special storage precautions. If, for instance, you
  have to stack empty skids or pallets, use equipment or get a helper.
  Don't drop or walk on empty skids or pallets; it could weaken them. In
  addition:
  - o Stack empties flat, not on end.
  - o Don't let them jut out into aisles.
  - o Stack them no more than four feet high.
  - o Watch out for splinters or nails.

# Packing and Unpacking

You also have to be aware of hazards and safety procedures when you pack and unpack containers. All cutting tools demand caution. Hold and use in a manner that won't cut you or someone else. Don't leave blades on the floor or any surface.

Take care with metal and plastic strapping, too. If it hits you in the face or eyes—or anywhere else, for that matter— you'll regret it.

Always wear heavy gloves and safety glasses when you attach or remove strapping. Use cutting tools that don't leave sharp edges. If you're packing, be sure to put the straps on with just the right tension—not too loose or too

tight. Don't lift by the strap unless it's designed for that purpose. When you remove the straps, use one hand to hold down the strapping and one to cut. Make sure that the sharp strapping end will go away from you when you cut. Once the straps are cut, place them immediately in a trash container so they don't hurt someone while lying on the floor.

### **Preventing Falling Objects**

One of the biggest hazards in a high-ceilinged warehouse is getting hit by falling objects. An object doesn't have to fall far to pack a powerful punch. To avoid such incidents, keep these safety procedures in mind:

- When working at heights, use signs and barricades to alert people on the ground level.
- When working on the ground, pay attention to warning signs and don't stand under people or materials.
- Don't keep tools and materials on the edge of a platform, ladder, railing, etc.
- Don't let tools stick out of your pocket when you're above ground; they could fall out when you bend or lean over.
- · Don't stand or walk underneath a crane, forklift, etc.

# Safe Lifting

- Stand close to the load and squat down to it; don't bend over. Grip the load firmly with your hands and bring it close to your body, with your weight centered.
- Tuck in your chin, and then let your legs push your body up.
- Be sure you can see over the load.
- As you move, take small steps and don't twist. Move your feet to change direction.
- To unload, face the spot and lower the load slowly, bending your knees.
- Place the load on the edge of the surface, with your fingers away from the bottom. Then slide the load forward.

#### Ladders

Material handling is not, of course, the only potential source of hazards in the warehouse. To make effective use of warehouse space, materials are often stacked. That means we may have to climb ladders to get to the top

shelves or racks in these high places. To prevent falls, we use our knowledge of ladder design and ladder safety. You know that ladders come in different types and lengths, designed for different uses and rated to hold different weights. When you select a ladder for a job, be sure it's taller than the point you want to reach and rated to hold you and anything you might carry. Inspect a ladder carefully before use; don't use one that has any missing or broken parts. In addition, keep these ladder safety rules in mind:

- Never use a metal ladder around live electricity. Only fiberglass ladders are permitted on QEC power plant sites.
- Set an extension ladder on a firm level surface, with its feet parallel to the firm surface it leans against.
- Angle the ladder so its feet are a distance from the wall that equals ¼ its length. In other words, set the bottom of a 12-foot ladder 3 feet from the wall.
- Don't place a ladder against a window, window sash, unlocked door, or anything unstable like loose boxes.
- · Secure the bottom of the ladder—or have someone hold it.
- · Never allow more than one person on a ladder.
- Face the ladder and hold the side rails as you climb up or down. Always maintain a three point contact when using a ladder.
- Carry tools and materials with a rope or belt—not your hand.
- Stand centered on the ladder; don't stretch or lean to the side.
- Stand no higher than four steps or rungs from the ladder top—two for a stepladder.

#### 5.2 WORKSHOP AND GARAGE AREAS

Machine repairs, welding, electrical work, carpentry, are just four of the jobs that could be associated with workshops at QEC. Good housekeeping and regular cleaning will reduce/eliminate injuries such as cuts and pulled muscles within the work area. A lack of protection when welding could result in "arc eye" or respiratory problems; oil on a floor could result in slipping; permanent or temporary deafness can result from a lack of hearing when running equipment.



# Housekeeping

- · Workshops must be kept clean and tidy.
- Combustible materials must not be allowed to accumulate in workshop areas.
- Spillages and waste materials must be cleaned up immediately.
- Broken glass, metal shavings and other sharp objects must be disposed of appropriately.
- Oily rags and cotton waste must be placed in an enclosed metal container separated from other waste materials.
- · Do not store heavy or bulky items on high shelves.

# Workshop equipment

- All tools, equipment, and machinery, must be visually inspected for defects before use and must be maintained in a safe, clean, and efficient working condition.
- Cutting tools must be sharp and the cutting edges must be covered when not in use.
- Tools must be returned to designated storage cupboards after use.
- All machinery must be retrofitted with guards and appropriate safety devices.
- Adjustable guards must be in place at all times when machinery is operating.
- Access to bump switches and other safety devices must not be restricted. Interlocks and emergency 'off' switches must be regularly tested.
- Machinery must be electrically isolated prior to cleaning, maintenance, or repair.
- Lifting equipment must be tested annually.
- Ladders must be inspected prior to use and must be secured when not in use.

# **Workshop Practice**

- Every person who works in a workshop has a duty to ensure that work is carried out in a safe manner without foreseeable risk to the safety of themselves or others.
- Great care must be exercised when using mechanical equipment to avoid personal injury or injury to others.

- Eating and drinking are not permitted in any workshop.
- Long hair, jewelry, and items of clothing, MUST NOT be allowed to hang loose when machinery is operated. Rings must not be worn.



### 6.1 GENERAL

When we think of workplace hazards, we most often think of a worker working in the plant surrounded by gensets and other equipment or outside around heavy equipment and all of their associated hazards. It is often thought that workplace hazards automatically disappear at the office door.

Unfortunately, this is not true. It is not unusual to hear of an office employee tripping over a computer cord or straining his/her back while moving a piece of office furniture.

An office setting has its share of safety hazards, but many can be eliminated.

#### Office traffic

- Keep floors clean and free of spills such as beverages, melting snow and rainwater.
- · Always walk, never run.
- Keep aisles and hallways clear of clutter, debris and tripping hazards such as wastebaskets, electrical and computer cords, foot stools and open drawers.
- · Wear footwear. Never walk around barefoot or in sock feet.
- Report torn or loose carpets, curled walk off mats, loose tile, uneven floor surfaces or any other condition that could lead to a slip, trip or fall to a supervisor immediately.

#### File cabinets

- Close file, desk and cabinet drawers when not in use.
- Put file cabinets and other storage cabinets far enough away from doors and alsles as to not interfere with exit routes or high traffic areas.
- Place the heaviest files or items in the lower drawers of file cabinets.
- Open only one drawer at a time.
- Use only the handle to open and close drawers to avoid finger injuries.

#### **Documents**

- Use caution when handling paper to avoid cuts.
- Fully close staples. Use a staple remover to remove staples.
- Utilize thumb guards if handling multiple pieces of paper.

# **Electrical equipment**

- Locate electrical outlets so that cords do not cross passageways.
   Secure loose cords to the floor if unable to locate an outlet close by.
- · Use only properly grounded outlets and equipment.
- Avoid using extension cords.
- · Replace damaged or worn cords immediately.
- Unplug equipment before servicing or working on equipment.

# **Machines and equipment**

- Place guards on machines with exposed moving parts before operating.
- · Do not operate a machine until you are properly trained.
- · Do not override safety devices. When in doubt, get help.
- Use common sense when using paper cutters. Keep fingers away from knife and cutting edges. Keep knife in down position when not in use.
   Replace loose guards, knife locks and springs immediately.

# Storage

- Use a ladder, stool or portable stair for reaching high objects. Never use a chair, carton or other objects not designed for the task.
- Store heavy objects at ground level.
- Cover or sheath knives and scrapers before storing. Use only for intended purpose.
- Do not store flammable liquids and paint in an office area. If flammable
  or hazardous materials are needed for office machines, keep it in limited
  quantities and store according to manufacturer's recommendations.

#### Other

- · Turn on lights before entering dark rooms or hallways.
- · Report burnt out or inadequate lighting to your supervisor.
- Do not lift beyond your capability. Get help with heavy or awkward loads.
- Do not remain at your desk or workstation if overhead work is being performed.
- If your job requires you to enter power plant or warehouse area, wear the required personal protective equipment.

#### **6.2 OFFICE ERGONOMICS**

We rely heavily on computers to help us perform our daily work. For some, dedicated computer work is necessary, while others multi-task throughout the day. No two people are the same, and ergonomics strives to fit the task to the person doing it.

Use the following information as a guideline to help make your work station more comfortable and ergonomically friendly.

#### Task Chair

An ergonomic chair will not function as designed unless you know how to operate the adjustable features correctly. To adjust your task chair, follow the steps:

- Sitting in the chair, raise or lower the seat so that your feet rest comfortably on the floor. Your knees should be slightly lower than your hips.
- Sit as far back in the chair as possible, and adjust the backrest height or lumbar support so that it fits into the curve in your lower back.
- If you have a seat slider, adjust the seat pan depth so that a closed fist fits between your knee and the edge of the seat.
- Adjust the backrest angle to achieve a torso-to-thigh angle of 93-113 degrees (have someone else look at you from the side).
- Adjust the seat pan tilt angle to a comfortable position.
- Adjust the armrest so that it is at your elbow height. If the armrests swivel, place the armrests in line with your forearm when you are using the mouse.
- Once you have adjusted the rest of your workstation, if your feet do not reach the floor, use a footrest.
- Remember to adjust your chair throughout the day to help relieve muscle tension in specific muscle groups.

# **Keyboard & Mouse**

There are numerous keyboard and mouse configurations and models available, however it is important to correctly position these tools to prevent repetitive strain injuries.

To properly position your keyboard and mouse, follow these steps:

- Sit close to the keyboard and mouse so that your upper arms hang in a relaxed position.
- Center yourself so that you are aligned with both the keyboard and mouse, depending on what is most frequently used. Position the mouse as close as possible to the keyboard to avoid rotating the shoulder.
- Adjust the height of the keyboard platform (or chair if there is not an adjustable platform), so that your shoulders are relaxed and elbow angle is 90 degrees or slightly greater.
- Adjust the angle of the keyboard platform slightly downward in a negative tilt, if able. This will help to keep your wrists straight.
- Do not put the mouse where you must stretch to the desk or out to the side of a keyboard to reach it.
- Your wrist should be straight while mousing, not angled toward your thumb or little finger.

# Some other important tips to limit overuse and awkward postures:

- Move the mouse from the elbow, rather than from the wrist down.
- Alternate mousing between left and right hands. Mouse buttons can be reconfigured to allow either hand to be used.
- Rest your finger lightly on the mouse button; do not hold it hovering above the mouse.
- Do not grip the mouse tightly hold it gently and glide it over the surface.
- Choose a mouse that fits your hand, and that can be used with either hand
- Use shortcut keys whenever possible to limit mouse use.
- If you are correctly positioned, a wrist rest should not be necessary.
  However, when a neutral wrist posture cannot be achieved or to reduce contact with hard surfaces, a wrist rest may be helpful. Do not plant your wrists on the pad while keying or mousing. Make sure the wrist rest is made of a soft gel or foam to minimize pressure on the underside of the wrist.
- Key with gentle, quick keystrokes. Do not pound on keys as this increases the force exerted.
- You can position the mouse over the numeric keypad with an articulating mouse platform or mouse "bridge".

- When mousing is a constant requirement (e.g. CAD applications), the forearm should be supported on a surface or with an adjustable armrest to reduce static loading of the arm.
- Alternative keyboards and mousing devices are available to accommodate for specific needs.

#### Monitor

- Proper monitor positioning is important in avoiding vision and neck problems. Follow these steps:
- The monitor should be positioned so that the top of the monitor is at eye level. The eyes should naturally look at a 15 degree downward position.
- The distance should be about arm's length (45 to 60 cm).
- Font size, specific applications and personal visual acuity and sensitivity will also determine the correct distance, however placing the monitor too far away can cause the user to lean forward and can lead to eyestrain.
- Bifocal users should lower the monitor so that text can be viewed through the proper prescription. Increasing the distance away from you also increases the field of vision available without moving the head.
- Tilting the screen upward slightly can also help. The monitor should be directly in front you, aligned with the area of the keyboard that you use most.
- Adjust contrast and brightness to your personal needs to reduce eyestrain.
- Look away from your screen periodically focus on a distant object to exercise eye muscles.

# Lighting

In a general office environment, the CSA recommended lighting level for computer work is 500 lux. These lighting levels can be adjusted for personal preference, and paper work may be augmented by task lighting. Glare is the main lighting concern when working with computers. To help minimize glare:

- Position monitors parallel to overhead lights and perpendicular to the windows.
- Ensure wall color is neutral (not too bright).
- Remove or cover shiny surfaces and objects.
- Use blinds or curtains to minimize window glare.

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- · Install diffusers on overhead fluorescent lights.
- · Adjust the angle of the monitor, so that the screen is vertical.
- Use incandescent task lights over source documents, but direct them away from monitor.

# Telephone

The telephone needs special attention if you use it often. Cradling the phone between the shoulder and ear causing awkward neck and shoulder postures and can lead to injury if used for prolonged periods or frequently throughout the day.

If you use the telephone frequently, a headset should be used to allow for hands-free operation. This will eliminate cradling of the phone between shoulder and ear while writing, handling documents or using the computer.

#### **Breaks**

One of the best ways to prevent injury, discomfort and fatigue is to take an "Ergo Break" - a pause or change in activity that allows muscles, joints and tissues that have been working to recover and rest. Muscles that remain in a static posture will fatigue, circulation will decrease, and you will notice discomfort. This may mean taking a short pause in activity to focus on a different task, rest your eyes, and most of all, change position.

Prolonged sitting is one of the major risk factors for low back pain, so give your back a break and stand, walk and stretch. It may also mean switching to another task that requires the use of different muscle groups and postures.



#### 7.1 HOUSEKEEPING

- Keep the work area clean, free of oil, grease, unnecessary tools/equipment, scrap metal and other materials. Ensure all slip and trip hazards have been eliminated.
- · Keep access/egress clear at all times.
- Clean-up spills promptly with proper absorbing materials and agents.
- Place all garbage and waste materials in appropriate containers and emptied on a regular basis.
- Store all oily rags in appropriate fire-approved steel containers.
- · Keep exterior walkways and stairways free of snow, ice and obstacles.

#### 7.2 BENCH GRINDER

- Check the tool rest for the correct distance from the abrasive wheel, maximum 1/8" or 3 mm.
- The tool rest must be adjusted so that its upper edge is not below the center line of the abrasive wheel.
- Check to make sure that all guards are in place and that the power button and cords are not damaged. Replace the grindstone when adjustment of the rest cannot provide 1/8" or 3 mm clearance.
- If the wheel has been abused and ground to an angle or grooved, reface the wheel with the appropriate surfacing tool or replace the wheel.
- Protect your eyes with safety glasses and a face shield at all times when grinding.
- Each time a grinding wheel is replaced, check the maximum approved speed (stamped on the wheel bladder) against the shaft rotation speed of the machine to ensure the safe operating speed (RPM) is not exceeded.
- A grinding wheel must not be operated at speeds exceeding the manufacturer's recommendation.
- The flanges supporting the grinding wheel should be a maximum of 1/3 the diameter of the wheel, and must fit the shaft rotating speed according to the manufacturer's recommendation.
- Bench grinders are designed for peripheral grinding. Do not grind on the side of the wheel.
- · Do not stand directly in front of the grinding wheel when it is first started.
- Wear CSA-approved hearing protection.

- Do not wear loose fitting clothing or jewelry that can be caught in the grinder.
- Ensure that long hair is tied back prior to operating a grinder.

### 7.3 PORTABLE GRINDER

- · Familiarize yourself with the grinder operation before commencing work.
- Never use the grinder for jobs for which it is not designed.
- · Inspect the tool and extension cord periodically.
- Always use the correct flange nuts and backing pads. The nut must center wheel on spindle.
- Test run the machine before grinding, when mounting wire wheels, when mounting cut-off wheels on grinders or when mounting other wheels to grinders.
- Always use PPE safety glasses and face shield, hearing protection, cover-all's and gloves. Do not wear loose fitting clothing or jewelry that can be caught in the grinder.
- · Ensure that long hair is tied back prior to operating a grinder.
- · Remove adjusting keys and wrenches prior to turning the grinder on.
- Ensure that work is secure prior to starting grinder.
- Never leave tool running unattended. Turn the power off when not in use.
- DO NOT USE TOOL IF SWITCH DOES NOT TURN IT ON AND OFF.
- Keep handles free from oil and grease.
- Compare the speed marked on the wheel and to the speed marked on the grinder.
- Never exceed the maximum wheel speed (RPM) that is marked on the grinding disc/wheel.
- When mounting the wheels, check them for cracks and defects, ensure that the mounting flanges are clean and the mounting blotters are used. Do not over tighten the mounting nut.
- Before grinding, run newly mounted wheels at operating speed to check for vibrations.
- Do not use grinders near flammable materials.
- When using a zip disk (cutting disk) do not use it as a grinder. (Do not use the face of disk to grind or for de-burring).
- Use the correct sized disk as per manufacturer's recommendation.
- Grinders are never to be used with handles or guards removed.
   Grinders with guards or handles removed are to be taken out of service as per QEC's Defective Tools SWP-009.

#### 7.4 PROPANE TORCH

- When using a torch, workers must wear additional protective clothing (gloves, eye protection).
- Prior to use, ensure that torching equipment is in good working order and the cylinder valves are clean. Check that fittings, hoses and heads are secure.
- DO NOT USE defective equipment.
- Use soapy water to check connections for leaks.
- Only use a spark lighter or electronic starter to light torch.
- Protect the propane hose from damage by:
  - Keeping torch flame away from hose.
  - Keeping hose free of kinks.
  - Not running over hose with equipment.
  - Not using the hose to lift the cylinder.
- A torch flame is difficult to see in daylight, be aware of and keep away from the flame.
- NEVER LEAVE AN OPERATING TORCH UNATTENDED.
- Other than the operator, all workers should stay at least 1 meter away from the torch.
- · Set torch units into support leg position when not in use.
- To shut off torch, close cylinder valve first, let gas burn out, close torch valve.
- · At the end of the day, disconnect hoses and store properly.

#### 7.5 GENERAL ELECTRICAL SAFETY

- All electrical tools and equipment must be grounded or double insulated.
- Only qualified and authorized electricians are allowed to service and repair electrical appliances, tools and equipment.
- Prior to operating electrical powered tools and equipment, ensure that you are working on a dry surface.
- Missing or damaged ground plugs of any appliance, tool or piece of equipment are to be repaired prior to use.
- Tools with damaged cords, grounds and housing units are to be tagged "Out of Service" and sent for repair. Defective electrical equipment must be reported to your Supervisor immediately.
- Damaged extension cords shall be tagged "Out of Service", repaired or replaced as warranted.

- Disconnect power tools from power source before making adjustments.
   Defective equipment needs to be tagged "Out of Service" and removed.
- Tools with electrical arcing brushes should be removed when you feel any tingling during use.
- All electrical equipment, acquired or used on QEC premises shall be approved in accordance with the provisions of Part I of the Canadian Electrical Code, (Standard C22.1-12), and certified for use by the Canadian Standards Association (CSA), or other acceptable testing agency.
- Flammable material shall not be stored or placed in proximity to electrical equipment.
- Extension cords should only be used for temporary service and should be maintained in good condition at all times. They should be routinely inspected for frayed, torn or split cords and damaged plugs or connectors. All damaged cords must be repaired or replaced immediately.
- Jacketed electrical cords should be used with portable electric tools and with extension lamps in boilers, tanks or other grounded enclosures.
- Always make certain that plug connector configurations match they are intentionally designed that way to prevent hazardous, or even fatal, electrical connections.
- Fire extinguishers of Class "BC" or "ABC" should be readily available in the event of an electrical fire. Class "A" which utilizes pressurized water shall not be used on electrical fires.

# 7.6 WELDING, CUTTING AND BURNING

- Always ensure that adequate ventilation is supplied since hazardous fumes can be created during welding, cutting or burning.
- Complete a welding, cutting and burning permit prior to starting any work and hand in the competed form to the plant operator.
- Where other workers may also be exposed to the hazards created by welding, cutting and burning, they must be alerted to these hazards and protected by the use of "screens".
- Never start work without proper authorization.
- Always have firefighting equipment on hand before starting.
- Check the work area for combustible material and possible flammable vapours.
- A welder should never work alone. A fire or sparks watch should be maintained.

- · Protect cables and hoses from slag or sparks.
- Never weld or cut lines, drums, tanks, etc. that have been in service without making sure that all have been purged or other necessary precautions are in place.
- Never enter, weld or cut in a confined space without proper air quality testing and a qualified safety watch in place.
- When working overhead, use fire resistant materials (blankets, tarps) to control or contain slag and sparks.
- Cutting and welding must not be performed where sparks and cutting slag will fall on cylinders. Move all cylinders away to one side.
- Open all cylinder valves slowly. The wrench used for opening the cylinder valves should remain on the valve spindle.
- Always ensure the regulator of a cutting torch has been removed and that the valve caps are secured to the cylinder valves prior to transport.

### 7.7 ACCESS/EGRESS

- · Areas of access and egress must be adequately lit.
- · If material may fall on a worker, overhead protection shall be provided.
- Access to and egress from a work area located above or below ground level shall be by stairs, runway, ramp or ladder.
- · Areas of access and egress shall be kept clear of obstructions.
- Areas of access and egress shall be kept clear of snow, ice, or other slippery material.
- Areas of access and egress shall be treated with sand or similar material when necessary to ensure a firm footing.

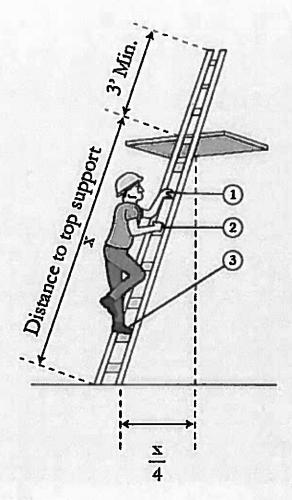
#### 7.8 LADDERS

- Only fiberglass ladders are to be used/stored in a power plant and on electrical sites.
- Always inspect the ladder prior to use. Check the integrity of the
  equipment is sound ensuring there is no damage to rungs, treads,
  braces, locking mechanisms, and uprights. Always ensure the feet are
  intact and in good condition. If the ladder is damaged, it must be
  removed from service and tagged out until repaired or discarded.
- Ensure the ladder is clean and dry prior to use.
- Set up the ladders on firm level ground. With self-supporting ladders (step ladders), ensure the locking mechanism is firmly locked to avoid

collapse. Never place a ladder on boxes, barrels or other unstable bases to obtain additional height.

- Do not use a step ladder as a singular ladder or in a partially enclosed state.
- Do not move or shift a ladder while a person or equipment is on the ladder.
- Ensure straight or extension ladders are positioned at the correct angle of 75 degrees or a ratio of 1:4 (see diagram).
- Always check for proximity hazards such as electricity cables, equipment, vehicles and people.
- Ensure ladders are suitably secured /footed at the base and that all locks on an extension ladder are fully engaged.
- Always tie the ladder (wherever possible) at the top to avoid the potential of the ladder slipping.
- An extension or straight ladder used to access an elevated surface must extend at least 3 feet above the point of support (see diagram). Do not stand on the three top rungs of a straight, single or extension ladder.
- Always maintain 3 points (two hands and a foot or two feet and a hand)
  of contact. Keep your body near the middle of the step and always face
  the ladder while climbing. If this is not possible, another means of
  access must be considered. (see diagram)
- Never lean or stretch from a ladder. With stepladders, never work off the side and never more that two-steps from the top platform.
- Never have more than one person on the ladder/step ladder at any one time.
- Do not exceed the maximum load rating of a ladder. Be aware of that ladders load rating and of the weight it is supporting.
- Never work alone when using ladders. Always make sure there is standby person on site.
- No more than one person shall climb or work off a ladder at the same time.
- A ladder placed in any location where it can be displaced by other work activities must be secured to prevent displacement or a barricade must be erected to direct traffic away from the ladder.
- Ensure you are wearing suitable footwear and any laces are tightly tied to avoid tripping.
- When outside, observe weather conditions. Stop work if the weather turns inclement due to wind, rain, etc.
- All ladders shall be transported horizontally and below shoulder level. Ladders over three meters shall be carried by two people.

 When the job is done always store the ladders away in the correct manner keeping the ladders protected from the weather. Never hang ladders vertically from the rungs/steps



#### 7.9 COMPRESSED AIR

- Compressed air must not be used to blow debris or to clear dirt from any worker's clothes.
- Ensure that the air pressure has been turned off and the line pressure relieved before disconnecting the hose or changing tools.
- All hose connectors must be of the quick disconnect pressure release type.
- Wear personal protective equipment such as eye protection and face shields. Restrict access to the area or ensure other workers in the area are aware of hazards.

- Hoses must be checked on a regular basis for cuts, bulges, or other damage. Ensure that defective hoses are repaired or replaced.
- A proper pressure regulator and relief device must be in the system to ensure that correct pressures are maintained.
- The proper air supply hoses must be used for the tool/equipment being used.
- The equipment must be properly maintained according to the manufacturer's requirements.

### 7.10 DEFECTIVE TOOLS

- When using hand tools be aware of problems like:
  - · chisels and wedges with mushroomed heads;
  - split or cracked handles;
  - chipped or broken drill bits;
  - wrenches with worn out jaws; and
  - tools which are not complete, such as files without handles.
- · To ensure safe use of hand tools, remember:
  - never use a defective tool;
  - double check all tools prior to use; and
  - ensure defective tools are repaired.
- Air, gasoline or electric power tools, require skill and the operators' complete attention, even when they are in good condition. Don't use power tools when they are defective in any way.

# Watch for problems like:

- broken or inoperative guards;
- insufficient or improper grounding due to damage on double insulated tools:
- no ground wire (on plug) or cords of standard tools;
- the on/off switch not in good working order;
- tool blade is cracked; and
- the wrong grinder wheel is being used, or the guard has been wedged back on a power saw.

Remove all defective tools from the work area and place "OUT OF SERVICE TAG" with description until to repaired or replaced.

#### 7.11 MOVING VEHICLES

- The Supervisor shall ensure that all workers, contractors and subcontractors will be informed of this procedure before moving or using vehicles, machines and equipment.
- All workers, contractors, and sub-contractors will use this procedure when moving or using vehicles, machines and equipment.
- When using vehicles, machines or equipment near energized overhead electrical conductors, no part shall be brought closer than minimum distance listed below.

Nominal phase-to-phase voltage rating	Minimum distance
750 or more volts, but no more than 150,000 volts	3 metres
More than 150,000 volts, but no more than 250,000 volts	4.5 metres
More than 250,000 volts	6 metres

- Operators of vehicles, machines and equipment shall be assisted by signalers if the operator's view of the intended path of travel is obstructed and/or a person could be endangered by the vehicle, machine or equipment and its load.
- A competent worker shall be designated as a signaler. Both the operator
  and signaler shall jointly establish the procedures by which the signaler
  assists the operator and both will follow those procedures. A loud
  signaling device, such as a whistle should be used to indicate either
  "STOP" or "GO".
- The signaler should be walking with the vehicle, machine, or equipment in a manner that gives the signaler an unobstructed view of the intended path of travel and in full view of the operator.
- The signaler shall station themselves in such a position that they have a clear view of the equipment and the electrical conductor and be in full view of the operator. The signaler shall warn the operator by the agreed method if any part of the equipment or its load may approach the minimum distance as listed in the table.
- If it is possible that a part of the equipment or its load may encroach upon the minimum distance, a legible sign that is visible to the operator and warns of the potential electrical hazard shall be posted at the operator's station.

#### 7.12 VEHICLE PARKING

- When parking a vehicle the best option is to drive forward into a parking space if that parking space allows you to drive forward when leaving.
   This is the safest way to park a vehicle as it never requires the driver to back up.
- QEC vehicles should be backed into parking spaces if driving into and out of the parking space is not an option. When approaching the parking spot, utilize the side view and rearview mirrors as well as performing a shoulder check to ensure that there is a clear view of obstacles, terrain, people and other vehicles. This way the driver is aware of the surroundings.
- Turn signals must be used to identify intention to park prior to backing into the parking space.
- If possible a spotter should be used to act as a guide. The spotter should be positioned at the rear of the vehicle on the driver's side and remain in the operators view throughout the maneuver. The guide will assist the driver through means of hand signals and must be able to clearly see the path the vehicle will follow.
- Backing into parking areas allows you to leave the parking area without having to back out. You have a clear view of the area ahead of the vehicle. Driving forward into traffic is much safer that backing out into traffic.

#### 7.13 DRILL PRESS

- Do not use the tool in the presence of flammable fluids or gases.
- Don't overreach Keep proper footing and balance at all times.
- Dress properly do not wear loose clothing or jewelry; they can be caught in moving parts. Wear protective hair covering to contain long hair.
- Remove adjusting keys and wrenches and disconnect tools from power source when not in use, before servicing, when changing wheels, etc.
- Ensure the switch is in the "off" position before plugging in tool.
- · Check damaged parts for damaged parts before operating the tool.
- · Keep handles dry, clean and free from oil and grease.
- Use the drill press in a well-lit area and on a level face, clean and smooth enough to reduce the risk of trips and falls.
- Never place your fingers in a position where they could contact the drill bit or other cutting tool parts.

- Always position backup material underneath the work piece.
- Before starting the operation, jog the motor switch to make sure the drill bit or other cutting tools do not wobble or cause vibration.
- If a work piece overhangs the table such that it will fall or tip if not held, clamp it to the table or provide auxiliary support.
- Use fixtures for unusual operations to adequately hold, guide and position the work piece.
- Use the spindle speed recommended for the specific operation and work piece material.
- Turn the motor switch off and unplug from the power source when not in operation.

### 7.14 COMPUTER USE

In order to minimize ergonomic injuries:

- · Use an adjustable chair, comfort is important.
- Adjust your seat height so that your forearms are parallel to the floor, or sloping slightly downward when using the keyboard. Your shoulders should be relaxed and not hunched. Elbows and upper arms should be close to your body.
- · Adjust the backrest angle of your chair to feel comfortable.
- Using a footrest if required, thighs should be parallel to the floor, or sloping slightly downward. There should be no pressure caused by the front edge of the seat under your thighs.
- Your monitor should be directly in front and items frequently utilized such as the phone should be within reaching distance.
- The screen should be located at a comfortable viewing distance approximately an arm's length away.
- The top of the screen should be at eye height and glare and reflections should be eliminated.
- Use a mouse mat, close to the keyboard, to prevent over-reaching.
- Use a straight wrist.
- Avoid crossing your legs or hugging the chair with your legs while using the computer. This inhibits blood flow, causing lower limb circulation problems, and increasing fatigue.

Have a break to relieve the fixed posture and fixed visual focus. Varying the task throughout the day is best. For extended computer work, short frequent breaks for say 2-3 minutes every 20-30 minutes is recommended. Moving is good. Keep your equipment is good working order. Screen

flicker, sticking keys on keyboards, and a rough-running mouse should be adjusted or repaired.

#### 7.15 WASTE MANAGEMENT

- All waste generated at projects and plants that can be classified as hazardous waste must be handled, stored and disposed of in accordance with QEC's Environmental Management System and Federal and Territorial government regulations.
- Non-hazardous waste generated during construction and maintenance must be recycled whenever possible.
- Equipment maintenance shall be restricted to designated and approved areas to prevent contamination of soils by accidental spills of toxic or hazardous materials.
- Walkways and exits shall be maintained in an orderly condition, free of waste products, debris and litter. All garbage and debris shall be disposed of at a landfill site.
- Hazardous materials such as used oil, paint, batteries, cleaning agents and water contaminated by freezing depressants will be collected and recycled or disposed of as hazardous waste.
- All hazardous, toxic, contaminated and dangerous waste shall be stored, transported and disposed of in accordance with the Hazardous Chemical Act, Nunavut WHMIS Regulations, Hazardous Waste Regulations and QEC HSE Policies and Procedures.
- Contaminated soils will be managed according to their concentrations of contaminants and their leach-ability. Appropriate disposal operations will be determined in consultation with relevant environmental protection agencies.

#### 7.16 EXPLOSIVE ACTUATED TOOLS

- Always review the manufacturers' specifications prior to working with any tool that utilizes an explosive charge to drive fastenings.
- Always wear hearing protection, hardhat, safety boots, eye protection and a face shield whenever working with an explosive actuated tool.
- Do not keep tool or explosive charges unattended when not in use.
- Explosive actuated tools should always be stored in a locked box when not being used.
- Do not load the tool until just prior to use. Unload the tool immediately upon completion of the task.

- The tool should never be pointed at anyone, whether it is loaded or unloaded.
- Hands should be kept clear of the muzzle end at all times.
- Explosive/powder actuated tools must never be used in an explosive atmosphere.
- To prevent free-flying studs, ensure that the material being driven into will not allow the stud to completely pass through it.
- Manufacturers' recommendations should be consulted and followed whenever there is doubt about the material being driven into, maintenance procedures or load strength to be used.
- Always be aware of other workers. Where a hazard to other workers is created by this operation, signs and barricades identifying the hazard area are mandatory.

#### 7.17 FORK MOUNTED WORK PLATFORM

- · Any fork mounted elevated work platform must be inspected prior to use.
- The platform must be positively secured to the fork carriage or backrest in a manner to support the weight of the platform and not allow platform movement on the forks. The use of a hoisting grade chain or wire rope securement system is acceptable.
- The platform must be fitted with a top guardrail, an intermediate rail and a toe board securely fastened to the posts and extending from the surface of the working area (See picture below). Metal screening in lieu of a mid-rail is acceptable.
- Moving machinery, including gears, chains, and shearing hazards created by the movement of the lifting mechanism, shall be guarded in a manner to protect the occupants of the platform.
- The platform deck should have a skid-resistant surface.
- The lift equipment is on a stable, level surface, unless it is rough terrain lift equipment.
- The operator of the lift equipment remains at its controls when the platform and the lift equipment are in the elevated position.
- The operator must immobilize the lift equipment vehicle against inadvertent movement before and during the time the work platform is occupied.
- The lift equipment operator must not leave the controls while workers are on the platform.
- The operator must respond to signals only from the designated signal person occupying the platform.

• The worker in the platform is wearing a fall arrest system when working at a height of 3 meters or more that is attached at an anchor point that can withstand a load capacity of 17.8 kN (4000lbf).

### 7.18 CONFINED SPACE ENTRY

- Employees will be trained that these areas must be with authorization by the Entry Supervisor only.
- Signage must be posted at the entrance of any confined space to prevent unauthorized entry.
- Prior to entering any confined space at QEC, a written hazard assessment must be completed by the Entry Supervisor to identify the hazards of the space and controls required to minimize risk. This must then be reviewed with the workers.
- Workers involved in the entry must receive adequate training prior to entering the space. This will include atmospheric monitoring (must be obtained from the HSE Dept.) and confined space entry and rescue procedures.
- A tailboard meeting must be held by the Entry Supervisor, workers entering the space and the attendant prior to entry.
- A confined space entry permit must be filled out prior to entry and posted at the entrance of the confined space. One copy of this permit to be kept on site and one copy forwarded to the HSE Dept.
- The entrant will monitor air quality and ensure that oxygen levels exceed 18%.
- The entrant will enter the confined space attached to a body harness and lifeline if it does not introduce additional hazards to the entrant rescue strategy.
- An attendant trained in confined space entry and first aid will stand at the entrance of the confined space and verbally or visually communicate with the entrant continuously. The entrant will remain in the crawlspace for no longer than one (1) hour at a time without visual contact with attendant.
- An effective means of communication (two-way radio or visual) must be in place prior to entry into a confined space. Radios must be tested to ensure that they are fully operational within the space.
- Co-entrant(s) will enter solely to observe entrant and assist as necessary. Co-entrant will assist with providing lighting and tools, and will be prepared to move entrant out in the event of injury. Entrant will enter the confined space with a body harness and lifeline if it does not introduce additional hazards to the entrant.

#### 7.19 SPOTTERS/SIGNALLERS

- Prior to maneuvering a piece of equipment or placement of a load,
   Spotters/signallers will be identified during the completion of a tailboard and used as required.
- · Spotters/signallers must wear high visibility clothing or safety vests.
- Spotters/signallers must communicate with equipment operators using appropriate hand signals. These signals must be reviewed by the operator and spotter/signaler prior to starting work.
- Spotters/signallers will watch all activity surrounding the equipment work area.
- Before each signal, spotters shall ensure that no hazards exist that endangers any workers, equipment or property in the work area.
- Equipment shall move only with instruction from the designated signal person with the exception of "Emergency Stop" which can be given by any worker.
- Designated spotter/signaller to be in view of and maintain eye contact with the operator at all times.
- Designated spotter/signaller must know hand signals.
- · Designated spotter/signaller must plan an escape route.
- Always keep a safe distance away from the equipment in the event of a rollover or equipment failure.
- If required a second spotter will be used.

#### 7.20 USE OF HAND TOOLS

- Only use hand tools for their intended purpose. Do not, for example, use a screwdriver as a chisel.
- All hand tools must be in good condition. Any hand tools that are unsafe due to damage shall be removed from service and tagged.
- Tools which are struck by hammers such as chisels or punches should have the head ground to prevent mushrooming.
- Never secure any work with your hand in which a blade can slip and cause injury.
- Always keep all cutting edges sharp replace or sharpen as needed.
- When working with tools always place them in a position in which they cannot fall on others working at a lower level or pose a tripping hazard.
- Always store tools in the proper places to avoid damage to tools and injury to one's self.

- Never carry tools such as chisels and screwdrivers in a pocket where they can cause injury when bending over or in the event of a fall. When carrying tools protect the cutting edges and carry the tool in such a manner that you will not endanger yourself or others.
- All tools that are to be used for electrical work shall have an insulated handle that is free of any defects.

#### 7.21 CHAINSAWS

- PPE required for chainsaw use includes hardhat, safety glasses, face shield, hearing protection, safety boots, leather gloves, protective leggings (chaps) and leather jacket (if working from a bucket).
- Chainsaw shall be equipped with operational chain breaks and chains designed to minimize kickbacks.
- The correct method of starting, holding, carrying or storage and use of the chainsaw as directed by the manufacturer must be followed.
- The chain must be sharp, have the correct tension and be adequately lubricated during operation.
- Chainsaw must be adjusted so that the chain stops when the motor is idling.
- Ensure that the chain brake is functioning properly and adequately stops the chain.
- When carrying/transporting a chainsaw the bar guard must be in place, the chain bar must be towards the back and the motor must be shut off.
- Fuelling of the chainsaw must be done in a well-ventilated area. Never fuel a chainsaw that is running or hot.
- An approved safety container must be used to contain the fuel used along with a proper spout or funnel for pouring.
- The chain brake must be engaged prior to starting the chainsaw.
- The chainsaw must not be adjusted when the motor is idling.
- · The chainsaw must not be used for cutting above shoulder height.
- When the work is completed ensure that the chain brake is engaged.
- Any employee who is required to use a chainsaw from above ground must do so only from an approved work platform.

#### 7.22 USE OF CLEANING SOLVENTS AND FLAMMABLES

Special care must be taken to protect the worker from hazards which may be created from the use of these liquids. Wherever possible, solvents should be nonflammable and nontoxic.

Supervisors must be aware of all solvents/flammables that are used on the site and be sure that all workers who use these materials have been instructed in their proper use and any hazard they pose. The following practices will apply when solvents/flammables are used:

- · Use nonflammable solvents for general cleaning.
- When flammable liquids are used, make sure that no hot work is permitted in the area.
- · Store flammables and solvents in special storage areas.
- Check toxicity hazards of all solvents before use (MSDS).
- Provide adequate ventilation where all solvents and flammables are being used.
- Use goggles or face shields to protect the face and eyes from splashes or sprays.
- · Use rubber gloves to protect the hands.
- Wear protective clothing to prevent contamination of worker's clothes.
- When breathing hazards exist, use the appropriate respiratory protection.
- Never leave solvents in open tubs or vats. Return them to storage drums or tanks.
- Ensure that proper containers are used for transportation, storage and the field use of solvents/flammables.
- Where solvents are controlled products, ensure that all employees using or in the vicinity of use or storage are trained in the Workplace Hazardous Materials Information System (WHMIS).
- · Ensure all WHMIS requirements are being met.

#### 7.23 HOISTING AND RIGGING

### **Crane Operator**

- Assign appropriately sized equipment and appropriately trained people to perform the task.
- Maintain the equipment in accordance with manufacturers' recommendations and specifications as well as applicable safety regulations.
- Establish and follow preventative maintenance and inspection programs.
- The operator has the obligation to refuse to perform a lift if they consider it unsafe to do so.

#### **Lift Coordinator**

 Assess the lift to determine whether it is a critical lift, a serious lift or a standard lift.

### (a) A Critical Lift is one where:

- the lift is over or near energized electrical equipment such as power lines and switchgears; or
- the lift is in a confined space or restricted area where the load or any part of the crane structure could come within 24 inches (600mm) of any existing structure or building; or
- failure of the lift could damage existing facilities or equipment; or
- the load will be greater than 90% of the manufacturers rating chart; or
- a lift involving two or more cranes lifting the same load simultaneously where the load may exceed more than 75% of any one cranes lifting capacity as measured on the lifting chart; or
- any load where special lifting or rigging equipment is used.

### (b) A Serious Lift is one where:

- the lift is between 80% and 90% of the cranes rated capacity; or
- · personnel are being lifted in a man lift; or
- the load or any part of the crane could come within approach limits for overhead power lines or transformers; or
- the actual weight of the load is unknown; or
- any lift that involves the use of two (2) cranes where the load is less than 75% of any one crane.

### (c) A Standard Lift is any other situation where a crane is used.

- Employ a lift plan appropriate for the classification of the lift and communicate the plan to all affected parties.
- Ensure the ground beneath can support the loads imposed by the crane.
- Ensure that adequate space is provided to safely assemble, erect and operate the crane.
- Ensure that the cranes are placed in the optimum position for capacity and clearance from obstacles.
- Inform the crane operator of any hazardous conditions in the work area.
- Communicate the weight load (if known) to the operator.
- Ensure that pre-lift meetings are held if appropriate.

- Ensure that lift procedures and plans are adhered to. If a lift cannot be carried out according to plan, the lift is to be stopped until a formal review of the plan is completed. Any changes to the original lift plan must be reflected on the tailboard meeting.
- Designate a competent signal person and identify that person to the crane operator.

### Rigger

- Rig loads and equipment in accordance to regulations and manufacturers' specifications.
- Interpret sling charts and lift plans.
- · Identify appropriate rigging components for the load to be lifted.
- Visually inspect rigging components on a regular basis and prior to each lift to ensure compliance with applicable codes, standards, specifications and procedures.
- Know and understand operating parameters of cranes and be capable of reading wire rope, chain and synthetic sling capacity charts.
- · Know and use appropriate hand signals for hoisting and moving loads.
- · Give signals in a slow, smooth and decisive manner.
- · Be aware of hazards and obstructions.
- Communicate with the crane operator throughout all stages of the rigging process.



#### SECTION VIII RESOURCE MATERIAL

This booklet has been developed as a quick reference guide for workplace health and safety. Additional information can be located in the following resource materials:

#### 8.1 INTERNAL

- Health and Safety Manual
- Plant Operator Training Program
- Intranet Site
- Spill Contingency Plans
- Emergency Plans

#### 8.2 EXTERNAL

- Infrastructure Health and Safety Association
- Northern Safety Association
- Original Equipment Manufacturers Specifications
- Nunavut Safety Act and Regulations
- Nunavut Workers' Compensation Act
- Nunavut Fire Prevention Act
- Nunavut Labour Standards Act
- National Fire Code of Canada
- National Building Code of Canada
- National Electrical Code of Canada
- · Canadian Center For Occupational Health and Safety website

If you have any questions, be sure to discuss them with:

- your Supervisor
- your Joint Occupational Health and Safety Committee
- · your union representative
- the HSE department

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## SECTION VIII RESOURCE MATERIAL

PHONE NUMBERS:				
NOTES:				

### SECTION VIII RESOURCE MATERIAL

### SAFETY RULE BOOK RECEIPT

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# SCHEDULE E QEC CORPORATE POLICIES AND PROCEDURES

#### **SCHEDULE E-2: CONTRACTOR SAFETY PROGRAM**

Forming part of the Contract



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Section 16 Contractor Safety Program	Prepared by: Health and Safety Specialist - Gemma Braun	Issue Date: 2007
Approved by: President/CEO Peter Mackey	Reviewed by: HSE Sr. Manager Rick Hunt	Rev. 1 Rev Date: Jan 2012

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#### **APPENDIX**

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- A2. Incident Reporting Form
  A3 Site Inspection Form
  A4. WSCC Workers Report of Injury Form
  A5. NT-NU Interactive Spill Report Form



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#### 1. INTRODUCTION:

This document contains pertinent information for any and all contractors and subcontractors that may be contracted to do work for Qulliq Energy Corporation (QEC).

Contractors and subcontractors shall be responsible to read and abide with all requirements as listed herein as well as the other sections that make up the Health and Safety Manual.

This guide has been developed to ensure that all contractors/subcontractors and their employees meet our standards of excellence prior to any work being performed at our facilities. Listed in Step I, Safety Guidelines are documentation requirements that QEC must have on file before any contracted work occurs.

If any disputes arise between the QEC Contractor Safety Program and legislated requirements, the more stringent will apply.

#### 2. PURPOSE:

The purpose of the QEC Contractor Safety Program is to:

- Ensure that procedures are in place that will benefit both QEC and contractors in the completion of projects with zero harm to employees and minimal impact to the environment;
- Ensure that contractors have WSCC and liability insurance coverage, HSE
  Policies and Procedures, work experience and competent staff to meet legislative
  requirements and the standards of Safety Excellence that QEC and its
  employees strive to achieve; and to
- Ensure no harm to the public.

The QEC Contractor Health, Safety and Environment guideline has three Steps that each contractor must work through in order to ensure compliance with all Occupational Health, Safety and Environmental legislation:

- Step I Award of Contract
- Step II Pre Job Site
- Step III On Site



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### 3. **DEFINITIONS**:

Contract Administrator	A QEC employee assigned to monitor the progress of the contract person and act as the primary QEC contact with the contractor. This includes all Project Managers, Project Monitors, Supervisors and Superintendents responsible for coordinating contract work.
Contractor	Anyone who does work involving construction, installation, repair, or similar services under a contract for QEC.
Contractor's Safety Program	The contractor's written document(s) regarding safety for its operations and employees. The document(s) will describe the elements of the safety program administered within the contractor's organization, how the safety program is implemented, and who is responsible for the correct functioning of each element of the safety program.
Confined Space	An area where hazardous air contaminants are likely to be present, and/or from which normal walking exit may be difficult. Examples of a confined space include tanks, vessels, pits, wells, ductwork, excavations, etc.
Confined Space Entry Permit	A permit issued by QEC and required before a confined space such as a tank, pit, or excavation may be entered.
Emergency Preparedness Plan	The operating procedures of the specific QEC site(s) and building(s) provided to the contractor and contractor employees by QEC Safety Representative detailing how to respond to and seek help for health emergencies, evacuations, or other emergency measures.
Welding, Cutting and Burning Permit	A permit issued by the QEC Safety Representative before work involving flames, hot surfaces, electrical arc, or spark-producing equipment is started.
Material Safety Data Sheet (MSDS)	A document detailing the hazards associated with a material and information regarding how to handle it safely. Contractors must provide updated MSDS's for all WHMIS controlled products brought on site.



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Project Safety Plan	Required from contractor for each major project and should include details of the work to be done, the method by which it will be done, who will do it, the hazards associated with the work or the area, and the hazard controls. The plan should also include a project responsibility breakdown, telephone call-in lists, and emergency services names, locations, and telephone numbers.
Safety Orientation	A meeting conducted by the QEC Safety Representative which all contractor's employees are required to attend before working at a QEC site, and every time the contractor returns to complete a new project.
QEC Safety Representative	The QEC employee responsible for reviewing the contractor's Project Safety Plan, the scope of the job, fire safety and fire emergency response on site and inspecting the job site before work begins and while work is being done.

<sup>\*\*</sup>NOTE: It is understood that when "contractor" is identified, both contractor and subcontractors are deemed to have been addressed.

#### 4. REFERENCE MATERIALS

**QEC Health and Safety Manual** 

QEC Safety Rule Book

Nunavut Safety Act and Regulations

Nunavut Fire Prevention Act and Regulations

#### 5. RESPONSIBILITIES

A QEC Contract Administrator must be assigned, and this procedure followed, anytime a contractor, consultant, tradesman, or other non-QEC personnel is hired to perform work at QEC. The roles and responsibilities are described below.



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#### **5.1 QEC Contract Administrator**

Every QEC employee who hires a contractor is responsible for ensuring that there is a Contract Administrator to provide the contractor with the necessary HSE documentation and to facilitate and oversee the project.

The QEC Contract Administrator is responsible for ensuring that an initial Safety Orientation has been completed and that all the appropriate forms are filled out and sent to the QEC HSE Department prior to any work being performed.

#### 5.2 Contractors/Prime Contractors

Contractors/Prime Contractors, while on QEC property, are responsible for the following:

- Providing QEC with proof of an active Workers' Safety and Compensation Commission (WSCC) account and liability insurance;
- Following any Project Management Plan that has been developed by QEC and/or adhering to the health and safety requirements as set out in the QEC Health and Safety Manual;
- Reading, understanding and adhering to the QEC Contractor Safety Guidelines;
- Having and understanding of and being in compliance with WSCC, Environmental and Occupational Health and Safety Regulations;
- Informing all employees and subcontractors of, and adhering to, the material found in the QEC Contractor Safety Guidelines;
- Attending the Contractor Safety Orientation Meeting and completing all the required forms for submission to the HSE Department;
- Inspecting work areas regularly and correcting any identified hazards;
- Ensuring that copies of any relevant safe work procedures are available on site for any high hazard work;
- Informing QEC Contract Administrator of any regulatory inspections. Copies of inspection reports and/or compliance orders are to be submitted to the QEC Contract Administrator whom then forwards copies to the QEC HSE Department;
- Conducting investigations for all workplace incidents, incidents and near misses.
   Copies of all completed investigations are to be given to the Contract Administrator who then forwards them to the HSE Department;
- Complying with WSCC injured worker reporting requirements as outlined in the WSCC Act and Regulations; and



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• Ensuring that all employees under their supervision are suitably trained and oriented to their work environment to ensure that they are capable of performing their work in a healthy and safe manner.

### **5.3 HSE Department**

Responsibilities of the QEC HSE Department include:

- Providing information to the QEC Contract Administrator, outside contractors and contractors, as needed;
- Assisting the Contract Administrator with meeting the requirements outlined in the Contractor Safety Guidelines; and
- Reviewing all documentation to ensure compliance.

#### 5.4 QEC Management

Reviewing the Contractor Safety Guidelines annually.

#### **6 PROCEDURES**

The following sections outline the procedures that need to be followed whenever a contractor is hired to work on QEC property.

#### 6.1 Step I Award of Contract

The contractor must provide to the QEC Contract Administrator the following documentation. The Contract Administrator then forwards copies to the HSE Department for review and retention.

- A description of the work being done, abilities and performance expectations of contractor, how long the work is expected to take as well as the risk level of the work;
- Certificates of insurance. The contractor shall, at his/her own expense, maintain
  public liability and property insurance to protect the Corporation and the
  contractor against damage to property and/or persons from the performance of
  work associated with the contract. In addition, the contractor shall insure the
  material or equipment that is the subject of the contract to the value of its
  replacement cost to the Corporation, against all risks of physical loss or damage,
  however caused, and shall name the Corporation as an additional insure on such
  policy or policies. At the request of the Corporation, the contractor shall furnish
  certificates of insurance evidencing that such coverage(s) are in effect;



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- WSCC Certificate of Clearance must be provided at the time of quotation and current clearance certificate must be provided before commencing work. Renewal clearance certificates must be provided prior to the expiry of an existing clearance certificate; and
- Trade qualifications to perform the jobs required.

#### 6.2 Step II Pre Job Site

#### 6.2.1 Pre-Job Meeting

The purpose of the Pre-Job Meeting is to discuss any specific safety concerns unique to the site and other applicable concerns by QEC and the project delivery. It is the responsibility of the Contract Administrator to ensure a copy of the QEC Safety Rule Book is requested prior to the Contractor's start date from the HSE Department to ensure delivery. Each Contractor and Sub Contractor must have their own copy of the QEC Safety Rule Book.

All applicable sections must be communicated in a way that the QEC Employee is confident that the material contained therein is clearly understood by all contractor employees. Items to be covered at this meeting must include but are not limited to:

- Emergency and spill response procedures
- Incident reporting
- Notification of any hazardous products and /or work
- Contractor's responsibility in regards to sub-contractors
- Working alone or in an isolated area
- Working at heights
- Project specific health and safety hazards and /or procedures
- Locations of first aid and other emergency medical services
- Inspections, tailboard meetings and permits

#### **6.2.2 Safety Orientation Instructions**

It is the ultimate responsibility of the Contract Administrator to ensure that the Contractor Safety Orientation is conducted prior to work commencing. The largest sections that require completion entails the reading and understanding of the QEC Safety Rule Book and the physical site orientation. The HSE Department maintains copies of the QEC Safety Rule Book for distribution as operations require.



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Once the Contractor Safety Orientation Checklist has been fully completed and all affected parties have signed off on the document, a copy of the document must be created and filed in the site of hire.

The original document must be sent to the Health, Safety and Environment Department without delay. Once received, a representative of the HSE Department will verify that the document has been completed accurately. If not completed accurately, the HSE representative will contact the Contract Administrator to fully complete.

Once the Contractor Safety Orientation Checklist is completed the HSE representative will sign the document and indicate the date it was received. All Orientations will be placed into a master file within HSE Records both electronically and physically. Copies of completed orientations will be made available to be viewed by the WSCC Safety Officers, as requested.

#### The following is a list of safety rules to include:

- 1. Whenever work is done with flammable liquids or with compounds containing flammable materials, such as adhesives or sealers, take care to assure proper ventilation and to restrict or control sources of ignition. Allow only a minimum amount of flammable liquids in storage on the premises. Copies of Material Safety Data Sheets (MSDS's) must be on site for all WHMIS controlled products.
- 2. Any use of open flames (such as welding, cutting or torches) or other hot work such as grinding must be done only after inspection of the site and the issuance of a Welding, Cutting and Burning Permit by an authorized person. All necessary safety precautions must be strictly observed.
- 3. Welding flash must be shielded by means of curtains or barriers if done in the vicinity of unprotected employees, visitors or the general public.
- 4. The Utility Work Protection Code must be applied in all work situations where devices (switches to turn off power or valves to drain tanks) are placed in a position that provides safe working conditions.
- 5. Connections to, use of or shutting off of water lines must not be done without prior authorization by plant management. Take appropriate steps to provide alternate protection where required.
- 6. Where overhead work will be done that presents hazards for those below, rope off or barricade work areas to keep out unauthorized people.
- 7. Barricade excavations and floor openings, and place warning signs and lighting where required.
- 8. Fall protection must be used whenever working at a height of 3 meters or more.



Section 16 – Contractor Safety Program	Prepared by: Health and Safety Specialist - Gemma Braun	Issue Date: 2007	
Approved by: President/CEO Peter Mackey	Reviewed by: HSE Sr. Manager Rick Hunt	Rev. 1 Rev Date: Jan 2012	

- Lockout/tag-out Contractor's employees must never remove any safety device such as tags, chains or locks on existing plant or equipment, or attempt to use the equipment without proper authorization. Contractors must abide by the established lockout/tag-out procedures.
- 10. Temporary wiring must conform to codes and practices.
- 11. Where our practices or the WSCC Safety Act require the use of personal protective equipment, it must also be worn by the contractor employees.
- 12. Vehicles used by contractors must be operated according to the Highway Traffic Act.
- 13. Contractors must make regular safety inspections of the area where work is being done, and provide copies of inspections for review by the contractor administrator.

The contractor must assume responsibility for sub-contractors and monitor their safety compliance. This is particularly important in jobs involving high potential for serious injury or death, such as live line, trenching, work at elevations or in confined spaces, or Radial Boom Derrick (RBD) operations near high voltage power lines.

### **6.2.3 Tailboard Meetings**

Communication is critical in completing job tasks safely. All contractors must hold tailboard meetings at the worksite each day that they are continuing a task, when there are significant changes that occur during the course of the work, or when a new a task commences. Responsibility for ensuring completion of the Contractor Safety/Tailboard Meeting falls to the Qulliq Energy Contract Administrator who will act as project leader.

#### 6.3 Step III On Site

### **General Safety Requirements**

The contractor shall keep the job site free from health, safety and environmental hazards and ensure that its employees are competent and properly trained in all health and safety aspects of the job. Specifically, the contractor must ensure that:

- QEC is promptly notified of any injuries to an employee that occurs during the
  performance of work at the job site and requires medical treatment. QEC
  must also be promptly notified within a 24 hour period of any and all
  inspections conducted at the work site by any local government agency.
- QEC must be immediately notified of any damage to company property.



Section 16 – Contractor Safety Program	Prepared by: Health and Safety Specialist - Gemma Braun	Issue Date: 2007	
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- Employees do not use, be under the influence of, or have in their possession any alcoholic beverage or illegally obtained drug, narcotic, or other substance while on QEC property. Smoking is not permitted three meters from any exit/egress or air intake of any QEC workplace or in any motor vehicle.
- All waste is properly disposed of in accordance with applicable local regulations including:
  - o Properly disposing of any waste, including hazardous waste
  - Labeling all containers as to contents and hazards
  - Providing a means to capture any fluids leaking from equipment
- All contractors must participate in and comply with any job briefings/tailboard conducted by QEC employees. During these briefings/tailboards all parties will specify safe work procedures, the potential hazards of the job, and Emergency Response Procedures. If any participant has any questions or concerns about the work, he/she must voice them during the briefings/tailboard. Additional job briefings will be conducted during the work as conditions, work procedures, or personnel change. The QEC HSE team will assist all contractors to gather information of the work being performed.
- All work performed by the contractor must meets the minimum safety requirements established by WSCC safety Act and Regulations as well as all QEC Policies and Procedures.
- All contractors must comply with the Utility Work Protection Code when working around any live electrical equipment.

#### 7. DOCUMENTATION

All of the documentation as outlined in the above procedures is to be submitted by the contractor to the QEC Contract Administrator.

Each department or location is required to maintain a file of the documentation required by the QEC HSE Department Contractor Safety Program. Copies of all documentation are to be forwarded to the HSE Department and will be kept on file.



Section 16 – Contractor Safety Program	Prepared by: Health and Safety Specialist - Gemma Braun	Issue Date: 2007	
Approved by: President/CEO Peter Mackey	Reviewed by: HSE Sr. Manager Rick Hunt	Rev. 1 Rev Date: Jan 2012	

#### 8. PROGRAM REVIEW

A review of the Contractor Safety Program will be conducted on an annual basis

#### 9. CONTRACTOR INFORMATION

#### 9.1 Incident Investigation Guidelines

#### **Purpose:**

An effective incident investigation program will methodically examine an undesired event that resulted in physical harm to people, property damage, or harm to the environment. The intent of these investigations is to establish facts and circumstances, and to determine causes and assign remedial actions.

#### **Guidelines when to complete an Incident Investigation:**

When an incident occurs that requires medical aid (see definition of incident), or if management and/or the Joint Occupational Health and Safety Committee feels that an incident needs to be further investigated. Incidents that must be reported to the Area Operations Supervisor / Manager include:

- Minor Injuries;
- Medical Aid;
- Occupational Illnesses;
- Critical Injuries and Death;
- Fire and Explosions;
- Property Damage at or above \$1,000;
- Hazardous Substance Discharge and Environment Spills and other related incidents;
- Motor Vehicle Incidents; and
- Other incidents not resulting in damages or injury but potentially could have (near misses).

When conducting an investigation always remember the following:

- Safety of all employees is our foremost goal;
- What may seem cut and dry is not always so; and
- An incident report must be clear enough that an outsider to the Corporation can read and understand what the writer is trying to say.



Section 16 – Contractor Safety Program	Prepared by: Health and Safety Specialist - Gemma Braun	Issue Date: 2007	
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#### 10. FORMS

### **10.1 CONTRACTOR ORIENTATION CHECKLIST**

### **PRE-SITE**

1)	Check that all certificates of insurarequired by the contract have bee	•	
2)	<ul><li>Distribute Safety Rule Books</li><li>PPE Requirements</li><li>Trade Certificates</li></ul>		
3)	Ensure that contractor is aware of Conditions and Regulations	Community By-Laws,	
	ON-SITE		
1)	check qualifications and training con site	ertificates of trades people	
2)	Collect signed documentation from	n all workers	
3)	Check that all workers are using re Protective devices	equired personal	
4)	Discuss any specific safety conce Site including a walk through to;  • Identify Hazards  • Locate Safety Equipment	rns unique to the job	
5)	Emphasize Contractor Responsib for daily job site house keeping	ility	
	Contractor Signature	QEC Employee Signature	Date

One copy to be kept on site and one copy to be forwarded to the HSE Dept.



Section 16 – Contractor Safety Program	Prepared by: Health and Safety Specialist - Gemma Braun	Issue Date: 2007
Approved by: President/CEO Peter Mackey	Reviewed by: HSE Sr. Manager Rick Hunt	Rev. 1 Rev Date: Jan 2012
10.2 SAFETY RULE BOOK	CACKNOWLEDGEMENT FOR	M
<u> </u>	_representing	
(print name)	(compar	ny name)
I	nereby acknowledge receipt of t	the
Qulliq Ene	ergy Corporation (QEC) Safety	y Rule Book,
which sets forth the health and safety rules and practices to be followed while working on QEC property. I declare that I have studied the contents of this manual and any additional safety information received from QEC before commencing work at this site.		
I agree to cooperate with QEC personnel who are authorized to intercede and ensure the enforcement of safe working conditions. Work can and will be suspended until any safety concern is remedied. Any infractions will be documented.		
Signature Date		
CONTRACT ADMINISTRATOR ACKNOWLEDGEMENT		
I have provided the contractor/ consultant with a copy of the		
		• •
	QEC Safety Rule Book	,,
	QEC Safety Rule Book  nt sections of the book and other round information with the above	er project related health

(Print Name)

One copy to be kept on site and one copy to be forwarded to the HSE Dept.



Section 16 – Contractor Safety Program	Prepared by: Health and Safety Specialist - Gemma Braun	Issue Date: 2007
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POLICIES AND PROCEDURES – check all that apply			
QEC Health and Safety Policy Responsibilities Obligation to Refuse Unsafe Work Safe Work Practices and Procedures Incident Reporting First Aid Emergency Evacuation Procedures Fire Fighting Equipment Hazard Identification and Reporting E-Stops Lock out/Tag-out System Company Health and Safety Rules Work Protection Code Confined Space Fall Protection Program Tailboards Use of Company Equipment/Tools (list all that are required)			
PERSONAL PROTECTIVE EQUIPMENT – check all that apply Contractors are required to provide their own PPE  Safety Glasses Steel Toed Boots Gloves Safety Vests Hardhat Hearing Protection Respirators			
Fall Protection  Other Information (hazardous products or procedures, comments on work being performed):			
Company: Date:			
Employees Name and Signature:			
Work Being Done:			
QEC Representative Signature: Date:			
QEC HSE Department: Date:			



# SCHEDULE E QEC CORPORATE POLICIES AND PROCEDURES

#### **SCHEDULE E-3: RENTALS OF CONTRACT EQUIPMENT**

Forming part of the Contract



Section 15 – Purchased,
Leased or Contractor
Supplied Equipment

Prepared by: Health and Safety Specialist - Gemma Braun

Issue Date: June 2012

Approved By: President/CEO
Peter Mackey

Approved by: Sr. HSE Manager Rick Hunt

Rev. # 0 Rev Date: NA

#### SECTION 15 PURCHASED, LEASED OR CONTRACTOR SUPPLIED EQUIPMENT

#### 15.1 POLICY

Qulliq Energy Corporation (QEC) is committed to providing a healthy and safe work environment for its employees, contractors, and customers. In order to ensure that QEC is in compliance with the *Nunavut Safety Act* and regulations, all equipment that is used in the course of service will meet all applicable QEC standards, and Government and industrial regulations, codes and standards.

Under no circumstances is any worker to knowingly utilize faulty equipment or equipment that has been modified without certification of a professional engineer in the course of performing their duties. All leased and contractor owned equipment must be operated in accordance with manufacturers specifications.

#### 15.2 PURPOSE

To assure QEC that all purchased, rented or contractor owned/leased equipment utilized on any QEC work site has been properly maintained and is in compliance with the WSCC Safety Act and Regulations.

#### **15.3 SCOPE**

This document refers to all purchased, rented or contractor owned/leased equipment utilized on any QEC work site.

#### 15.4 PROCEDURE

- Any QEC Project Manager involved with the purchase, hire or lease for equipment must ensure that all considerations, including legislative requirements, have been considered prior to the purchase of or arranging a lease of any equipment.
- 15.4.2 Consideration is to be given when purchases could impact on any of the following elements:
  - ergonomics



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Rev. # 0 Rev Date: NA

- emissions
- maintenance service
- manual handling
- noise
- training requirements
- waste management
- 15.4.3 This list is not meant to be exhaustive given the diverse range of activities undertaken at QEC but they highlight the key areas for consideration during the procurement process.
- 15.4.4 Potential hazards associated with the purchase, hire or lease of equipment are to be identified and evaluated prior to purchase, hire or lease.
- 15.4.5 The following hierarchy of controls and their principles should be applied when considering the purchase, hire or lease of equipment:
  - Eliminate: if the equipment is identified as a risk and is not necessary, do not purchase or lease. This removes the hazard completely.
  - Substitute: replace with a less hazardous option.
  - Isolation: restrict access to the equipment and lock away under strict control.
  - Engineer: modify or apply another suitable engineering control.
  - Administration: change work procedures to reduce exposure to the hazard.
  - Personal Protective Equipment (PPE): use gloves, safety glasses, fall protection or other PPE when appropriate.
- 15.4.6 Purchase orders or design specifications are to include requirements of legislation, the *Nunavut Safety Act* and Regulations and Codes of Practice relevant to the equipment along with any special health and safety requirements identified during the hazard evaluation process.
- 15.4.7 The procedure for ensuring health and safety requirements in specifications for services, tendering processes, contract documents and contractors' health and safety records are incorporated in the QEC Contractor Safety Program and the QEC Service Agreement.



# SCHEDULE E QEC CORPORATE POLICIES AND PROCEDURES

**SCHEDULE E-4: WSCC FORMS** 

Forming part of the Contract



## Clearance Request

☐ GOOD STANDING		ers of good standing at d registered with the WS		eginning of a c	ontract to en	sure y	our contractors are in good	
☐ FINAL	<ul> <li>Request final clearance letters before releasing final payments to your contractor. A final clearance relieves principals of any assessment liability related to a specific contract.</li> </ul>							
SECTION 1								
Principal (the compa	any awarding the	contract)				Employer Number		
Address								
Attention		Phone Number		Fax Number			Email Address	
SECTION 2						1		
Contractor (the cor	npany contracted	by the Principal)				Employer Number		
Address						·I		
Attention	Phone N		Fax Number			Email Address		
SECTION 3				<u> </u>				
Contract / Project #			Location					
Description of Work			1					
Contract Value \$			☐ Material ☐ La			abour		
Starting Date MM	DD YY		Con	Completion Date MM DD		YY		
Subcontractors:	☐ YES ☐	] NO				<u> </u>		
SECTION 4								
Subcontractor (the	e company contra	acted by the contractor)				Employer Number		
Address						ı		
Attention		Phone Number	Fax Number			Email Address		
Description of Work								
Contract Value \$			☐ Material		La	ıbour	☐ Equipment	
Starting Date MM	DD YY		Con	npletion Date	MM DD	YY		
Additional subcontractors	s, please complet	e page two of this form.						
	nis information	for the administration of	of the	Workers' Comp	pensation Ac	ts, the	Safety Acts, and/or the Mine	
SECTION 80 OF THE V	VORKERS' COM I A CONTRACT	MPENSATION ACT(S) HOOR / SUBCONTRACTOR						
Requested by				Signature _				
Phone Number(  )_	,	Please Print) ext. #		Data				
				Dale				

#### **Subcontractors (SECTION 4) Continued**

Subcontractor (the company contra				Employer Number			
Address							
Attention	Attention Phone Number		Fax Number		Email Address		
Description of Work							
Contract Value \$			☐ Material ☐ La		bour		
Starting Date MM DD YY			npletion Date MM	DD	YY		
Subcontractor (the company contracted by the contractor)					Employer Number		
Address							
Attention Phone Number			Fax Number		Email Address		
Description of Work							
Contract Value \$			☐ Material ☐ L		abour Equipment		
Starting Date MM DD YY			Completion Date MM DD		YY		
Subcontractor (the company contra				Employer Number			
Address							
Attention Phone Number		Fax Number			Email Address		
Description of Work							
Contract Value \$			Material	☐ La	bour	☐ Equipment	
Starting Date MM DD YY			npletion Date MM	DD	YY		
Subcontractor (the company contra				Employer Number			
Address							
Attention	Phone Number	Phone Number F		Fax Number			
Description of Work							
Contract Value \$			☐ Material ☐ I		bour	☐ Equipment	
Starting Date MM DD YY			npletion Date MM	DD	YY		

Head Office: Box 8888 ◆ Yellowknife, NT X1A 2R3 ◆ Telephone: (867) 920-3888 ◆ Toll Free: 1-800-661-0792 ◆ Fax: (867) 873-4596 ◆ Toll Free Fax: 1-866-277-3677 Box 669 ◆ Iqaluit, NU X0A 0H0 ◆ Telephone: (867) 979-8500 ◆ Toll Free: 1-877-404-4407 ◆ Fax: (867) 979-8501 ◆ Toll Free Fax: 1-866-979-8501



# SCHEDULE E QEC CORPORATE POLICIES AND PROCEDURES

### **SCHEDULE E-5: WELDING INSTRUCTIONS**

Forming part of the Contract

### QULLIQ ENERGY CORPORATION –SAFETY SPECIALIST

P.O. BOX 580 Iqaluit, NU X0A 0H0 Phone: (867) 979-7522 Fax: (867) 979-7519

### **HS4-01 WELDING CUTTING & BURNING PERMIT**

APPLICATION			
Name of Welder (Print)		License / Cert.#	
Name of Contractor (Print)			
Name of Supervisor (Print)			
Address			
Location			
Description of Work			
Fire Extinguishers			
Permit Expires			
Date		Time	
SPECIAL NOTES			
** Work Area and adjacent area in which sparks and heat mi sides of walls) must be inspected for at least 30 minutes after			
ISSUANCE This Permit is your authority to work in		<b>ER</b> I have completed my v	
the area described for the duration of the permit only.	hereby relinquis		
Welder	Welder		
Issuer	Issuer		
In Effect	Surrendered		
In Enect	Surrendered		
Date Time		Date	Time

#### GENERAL INSTRUCTIONS - WELDING CUTTING & BURNING

Work involving welding, cutting, and burning can increase the fire and breathing hazard on any job, and the following should be considered prior to the start of work.

- 1. Always ensure that adequate ventilation is supplied as hazardous fumes can be created during welding, cutting or burning.
- 2. Where other workers may also be exposed to the hazards created by welding, cutting and burning, they must be alerted to these hazards or protected from them by the use of "screens".
- 3. Never start work without proper authorization.
- 4. Always have fire-fighting or prevention equipment on hand before starting welding, cutting or burning.
- 5. Check the work area for combustible material and possible flammable vapours before starting work.
- 6. A welder should never work alone. A fire or sparks watch should be maintained.
- 7. Check cables and hoses to protect them from slag or sparks.
- 8. Never weld or cut lines, drums, tanks, etc. that have been in service without making sure that all precautions have been carried out and permits obtained.
- 9. Never enter, weld, or cut in a confined space without proper gas tests and a required safety lockout.
- 10. When working overhead, use fire resistant materials (blankets, tarps) to control or contain slag and sparks.
- 11. Cutting and welding must not be performed where sparks and cutting slag will fall on cylinders (move all cylinders away to one side).
- 12. Open cylinder valves slowly. The wrench used for opening the cylinder valves should always be kept on the valve spindle when the cylinder is in use.



# SCHEDULE E QEC CORPORATE POLICIES AND PROCEDURES

#### **SCHEDULE E-6: GENERAL TAILBOARD MEETINGS**

Forming part of the Contract

### **QULLIQ ENERGY CORPORATION**





Form HS 7-01 Revision 1 Rev Date: Aug 28, 2017

Emergency	☐ Radio/Cell Coverage Check ☐ Emergency Equipment Accessible						
Plan	Contact Numbers  Plant: Fire: Health Center:						
Job Details							
	Date: Job/Project: # of Crow Present:						
	Worker in Charge: # of Crew Present: Plant #:						
Traffic	Site Location: Plant #: Beacons						
Control	□ Lane Blockage □ Shoulder □ Partial □ Full □ 4-Way Flashers						
	☐ Site Flag Person Required ☐ Traffic Control Signs						
	☐ Outside Assistance R	☐ Traffic Cones/Barricades					
Vehicle	☐ Holding Valve Check (Daily, Prior to Use) ☐ Wheel Chocks (2 Properly Set)						
Set-up	☐ Outriggers (Min. Penetration) If Applicable ☐ Outrigger Pads Required						
	☐Stability ≤5°						
Special	☐ Yes Type of Equipm	Safety Orientation					
Equipment		ctor:					
Work at	☐ Travel Restraint/Climbing Rescue Equipment: ☐ QEC Rope Rescue Kit						
Heights	☐ Fall Arrest/Bucket W☐ Other:		er □Hand Line ::				
	Fal	l Rescue Plan for Work at Heights					
. a neseact and established							
De-energized	Work >750V	Live Line Work >750V	Work <750V or Near Live Circuits >750V				
Apparatus:		Feeder #:	Feeder #:				
☐ Plant Operator Informed of Work		Voltage:kV	LLP Required				
☐ Work Permit #		Live Line Permit #:	☐ Rubber Gloves Required				
☐ Self Protection Permit		☐ Boom Leakage Test Recorded >15kV	☐ Possible Back-feed				
#:		☐ Conductor Jib (12" Min. Ext. Clean)☐ Rubber Glove Air Test	□ Cover-up				
☐ Potential Check ☐ Grounds Installed		☐ Cover-up (Tested/Inspected)	☐ Vehicle Grounding ☐ Secondary Grounding				
☐ New Construction/ Outside 10ft		☐ Truck Grounds (Approved Ground	☐ Control of Wire Ends				
clearance - No Permit Required Point)							
☐ Hot Line Tools Tested/Inspected							

## **QULLIQ ENERGY CORPORATION**

## LINE TAILBOARD FORM



Form HS 7-01 Revision 1 Rev Date: Aug 28, 2017

	De	scriptio	n of Work			
	Use additional pape	er and att	tach to this docun	nent if requir	ed	
	We	Need t	o Consider			
Work Environment	Electricity		Hardware and E		Environment	
Other Work Groups Public Safety	Live Apparatus Induction/ Back-fo	eed	Porcelain Cutout Condition of Pole		High Winds Snowmobiles and AT	·Vs
Weather Conditions	Second Point of C		Adjacent Structu	res	Oil Leaks and Spills	
Confined Spaces Air Quality and Ventilation	Arc Flash Potentia		Equipment Failur		Insects	
Moving Vehicles/ Equipment	Live Line Procedu Limits of Approac		Hoisting and Rigg Sharp Objects/ T	_	Extreme Heat/Cold	
Mechanical Hazards	Cover-up		Loads Properly S			
Congested Work Area			Engineered Equi	pment		
Falling Objects Maintain Drop Zone						
Describe the obser	ved hazards		-What is done	to elimina	te/control haz	ard
Lead Hand n	nust ensure this tail	lboard is	conducted and r	eviewed by	all workers.	
Only the worker's initial will ac perform. I agree to wor						
Name	Trade		Company	On Site	Time	Initial



## SCHEDULE E QEC CORPORATE POLICIES AND PROCEDURES

## **SCHEDULE E-7: INCIDENT INVESTIGATIONS**

Forming part of the Contract

## QULLIQ ENERGY CORPORATION INCIDENT INVESTIGATION FORM



Form HS 13-01	Revision 3	Rev Date: 02/11/15

SECTION 1 INCID	ENI CLASSIFIC	CATION			
☐ Near Miss ☐	Injury □ Vehic	cle   Environment	☐ Propert	ty Damage □ Inc	ident
□ QEC	☐ Public	☐ Contractor (Ider	-	•	
		·			
Incident Number	Location	Date of Occurrence	Time	Date Repo	rted
		<u>l</u>	<u>l</u>		
ECTION 2 INCID	ENT DESCRIPT	TION (Attach additiona	al pages/pi	ictures if necessa	ry)
Click here to enter to	ext.				
SECTION 3 INJUI	PY INFORMAT	ION (If no injuries or ill	Inass occi	urrad skin this se	ction)
				·	Juoi i,
☐ First	Aid □ Me	edical Aid	Time L	☐ Fatality	
Was transportat	tion provided for	r medical attention?	□ Yes	□ No	
Name and contact					
Body Part Injured	<u>:</u>				
Type of Injury: Name of Medical	Practitioner:				
Treatment Provide					

\* FOR ALL INJURIES ATTACH COPIES OF APPLICABLE WSCC FORMS

## QULLIQ ENERGY CORPORATION INCIDENT INVESTIGATION FORM



Form HS 13-01 Revision 3 Rev Date: 02/11/15

## **SECTION 4 VEHICLE/PROPERTY DAMAGE/ENVIRONMENTAL INCIDENT** (Include driver information for vehicle incidents involving the public)

Check all the direct and indirect causes which may have contributed to the incident				
Unsafe Acts	Unsafe Conditions	Management System deficiencies		
☐ Improper Work Technique	☐ Poor Workstation Design	☐ Lack of Written SOPs		
□ PPE	☐ Fire/Explosion Hazard	☐ Safety Rules Not Enforced		
☐ Safety Rule Violation	☐ Congested Work Area	☐ Hazards Not Identified		
☐ Operating Without Authorization	☐ Hazardous Substances	☐ PPE Unavailable		
☐ Failure to Warn or Secure	☐ Inadequate Ventilation	☐ Insufficient Worker Training		
☐ Operating at Improper Speed	☐ Improper Material Storage	☐ Insufficient Supervisor Training		
☐ By-passing Safety Devices	☐ Improper Tools/Equipment	☐ Improper Maintenance		
☐ Guarding Not Used	☐ Insufficient Job Knowledge	☐ Inadequate Supervision		
☐ Improper Loading or Placement	☐ Slippery Conditions	☐ Insufficient Job Planning		
☐ Improper Lifting	☐ Poor Housekeeping	☐ Inadequate Hiring Practice		
☐ Not Following WPC	☐ Excessive Noise	☐ Poor Process Design		
□ Horseplay	☐ Inadequate Hazard Control	☐ Inadequate Workplace Inspect		
☐ Drug or Alcohol Use	☐ Defective Tools/Equipment	☐ Inadequate Equipment		
☐ Unsafe Acts of Others	☐ Insufficient Lighting	☐ Unsafe Design or Construction		
☐ Unnecessary Haste	☐ Inadequate Fall Protection	☐ Unrealistic Scheduling		
☐ Other:	☐ Other:	☐ Other:		
ist Immediate Corrective Actio	n Taken: Click here to enter te:	XT.		

# QULLIQ ENERGY CORPORATION INCIDENT INVESTIGATION FORM



Form HS 13-01 Revision 3 Rev Date: 02/11/15

	0				
SECTION 6 AGEN	GIES NOTIFIED				
□ WSCC	☐ GN DoE	□ RCMP	☐ Fire	e Department	
Name of Individual Notified Date Notified					
SECTION 7 SIGNA	\TIIDEQ				
			0!	D-	1-
Investigator	Print		Sign	Da	te
Supervisor					
HSE					
Sr. Management					
	have been taken to reoccurrence	Assigned to Whom	Scheduled Completion Date	Actual Completion Date	Follow- up Date
Additional notes.	updates and reference	9S			
Additional notes,		es			
		es			
		es			
		9S			



## SCHEDULE E QEC CORPORATE POLICIES AND PROCEDURES

## **SCHEDULE E-8: SURFACE PREPARATION AND PAINTING**

Forming part of the Contract

.



CLIENT: QULLIQ ENERGY CORPORATION

PROJECT: QULLIQ ENERGY CORPORATION POWER PLANTS

**SIGNATURE** 

DATE

PREPARED BY:

W. Iglinski

201/-0 <u>(1·-08</u>

REVIEWED BY:

N. Naqi

2011-09-08

APPROVED BY:

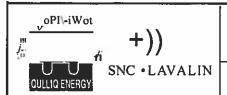
D. Leaney

#### **ISSUE/REVISION INDEX**

Issue			Revis	ion		Berisian Bataile
Code	No.	Ву	Rev'd.	Арр.	Date	Revision Details
RR	PA	W	NN	DL	2011-08-10	Released for Internal Review
RR	PB	WI	нянчян	DL	2011-09-08	Released for Client Review
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		7				

Issue Codes: RC - Released for Constructron, RD - Released for Desrgn, RF - Released for Fabricatron, RI - Released for Information, RP  $\equiv$  Released for Purchase, RQ  $\cong$  Released for Quotation, RR  $\equiv$  Released for Review and Comments.

SNC-LAVALIN has prepared this document for Quiliq Energy Corporation, pursuant to Services Agreement, Number 201026.



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#### 1.0 INTRODUCTION

#### 1.1 Scope

This specification summarizes the minimum requirements for surface preparation, and application of protective coatings on the external and internal surfaces of piping, equipment and equipment supports. It describes surface preparation, external and internal paint application and inspection requirements together with various paint systems and colour scheme as applied to shop and field painting of tanks, equipment supports, piping, and equipment for this project.

Painting of buildings is not addressed by this specification.

#### 1.2 Definitions

The following terms are defined as stated unless otherwise specified:

- a) "Owner" Qulliq Energy Corporation
- b) "Engineer"- SNC-Lavalin Inc. (SLI)
- c) "Supplier" -means the entity, manufacturer, vendor, erector, fabricator, contractor or supplier that supplies the materials or services, including all Sub-suppliers under him.
- d) "Local Authorities" means the Governmental Regulatory Authority controlling Laws, Codes, Rules or Regulations for the design, fabrication and installation of systems/equipment in the Northwest Territories and Nunavut.

#### 2.0 RELEVANT CODES AND STANDARDS

#### 2.1 Codes, Standards and Regulations

The following codes and standards form an integral part of this specification. Notify any conflict between this specification, or referenced standard or code to the attention of the Engineer / Client for resolution prior to proceeding. All referenced codes and standards are to be of the latest edition or revision. The Supplier is responsible to obtain all referenced Codes and Standards listed below:

ASTM D4285	Standard Test Method for Indicating Oil or Water in Compressed Air
ASTM D160	Evaluating Degree of Rusting on Painted Steel Surfaces
ASTM D2200	Standard Pictorial Surface Preparation Standard for Painting
ASTM D3359	Standard Test Method for Measuring Adhesion by Tape Test
ASTM D4417	Field Measurement of Surface Profile of Blast Cleaned Steel
ASTM E337	Standard Test Method for Temperature, Relative Humidity and Dew Point
CPCA	Canadian Painting Contractors Association
CAN/CGSB-1.38	Interior Undercoater



CAN/CGSB-1.40	Anticorrosive Structural Steel Alkyd Primer			
CAN/CGSB-1.57	Interior Alkyd Semigloss Enamel			
CAN/CGSB-1.59	Alkyd Exterior Gloss Enamel			
CAN/CGSB-1.140	Oil-Alkyl Type Red, Iron Oxide Primer			
CAN/CGSB-1.60	Interior Alkyd Gloss Enamel			
CGSB 85-GP-14M	Painting Steel Surfaces Exposed to Normally Dry Weather			
Occupational Health and Safety (OH&S) or equivalent provincial Statutes and Regulations, General Requirements				
Government of Canada-T 382, Standards Obstruction Marking, Air-Transport Canada				
	National Association of Corrosion Engineers (NACE International) Recommended Practice RP0287 – Field Measurement of Surface Profile of Abrasive Blast Cleaned Steel Surfaces			

## 2.1.1 Paint Application Specifications

SSPC-PA 1	Shop, Field and Maintenance Painting		
SSPC-PA 2	Measurement of Dry Paint Thickness with Magnetic Gauges		
SSPC-PA 3	Guide to Safety in Paint Application		
Steel Structures Painting Manual Volume I and II, Good Painting Practice latest edition as published by Steel Structures Painting Council			

## 2.1.2 Surface Preparation Specifications

Society for Protective Coating (Formally Steel Structures Painting Council-SSPC)

SSPC-SP1	Solvent Cleaning			
SSPC-SP2	Hand Tool Cleaning			
SSPC-SP3	Power Tool Cleaning			
SSPC-SP5	White Metal Blast Cleaning			
SSPC-SP6	Commercial Blast Cleaning			
SSPC-SP7	Brush-Off Blast Cleaning			
SSPC-SP8	Pickling			
SSPC-SP10	Near White Blast Cleaning			
SSPC-SP11	Power Tool Cleaning to Bare Metal			
SSPC-SP12	Surface Preparation by high Pressure Water Jetting			



SSPC-SP20	Zinc Rich Primers (Type I, Inorganic and Type II, Organic)
SSPC-AB1	Abrasive Specification No. 1, Mineral and Slag Abrasive
SSPC-VIS1-02	Visual Standard for Abrasive Blast Cleaned Steel
SSPC-VIS3	Visual Standard for Power and Hand Tool Cleaned Steel

#### 2.1.3 ASTM Standards for galvanizing

A-93	Steel Sheets
A-120	Pipe – Welded and Seamless
A-123	Structural Steel
A-153	Hardware, Bolts, Nuts, etc
A-386	Fabricated Items

## 2.2 Language and Measurement System

All drawings and documents will be in English language only.

All units will be in accordance with the SI-Metric System.

#### 3.0 OPERATING ENVIRONMENT

For the detailed site climatic data, refer to Geographic, Climatic and Seismic Data.

#### 3.1 Safety and Environmental Protection

Comply with safety and permit requirements of the Engineer / Owner and the SSPC – PA 3, Guide to Safety in Paint Application.

Comply with the safety and environmental protection regulations of federal, territorial and municipal departments or any other agency having jurisdiction including those of worker safety and environmental protection. The Engineer / Owner safety rules and regulations must be adhered to at all times.

Wear air respiratory equipment or air-purifying respirators as approved when the vapors in a confined space may approach or exceed the limits as set forth in "Threshold Limit Values for Solvent Vapors" adapted at the meeting of the American Conference of Government Industrial Hygienists. Territorial regulations apply where more stringent.

Ground abrasive blasting hoses and nozzles to dissipate static electrical charges. Also, ground airless spray machines or work.

Use safety shields, helmets, goggles, respirators, hearing protection, protective fire retardant clothing and safety footwear must meet the Engineer / Owner safety standards during the cleaning, blasting or coating operations.



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Move blowers or exhaust fans to confined areas.

Only manufacturer approved thinners, solvents and cleaners are permitted. Use safety solvents only for cleaning. Do not use solvents such as chlorinated hydrocarbons, gasoline, benzene, benzene (Bensel), etc. because of their toxicity and/or flammability. Approval of the Engineer I Owner is required before any products are brought on site. Provide the Material Safety Data Sheet (MSDS) for such approval.

Do not dispose any paint, solvent, new or used blasting abrasive, or any other industrial waste material on the Owner's property. Organize the work area in such a way that accidental spills of paint or solvents cannot escape into the environment. At all times, handle all materials in a manner complying with the Engineer / Owner, federal, territorial and local environmental regulations as well as manufacturer's instructions.

Use of paint that contains lead, chromium and other heavy metals is prohibited. All volatile organic compound (VOC) content of all materials to meet Federal, Territorial and Local regulatory requirements.

Painting materials, including thinners, brought on site require correct WHIMS labeling. Current MSDS(s) to accompany each shipment. MSDS to include batch number, date of manufacturer and shelf life.

All surface preparation requires the removal of any lead-based paint. Submit lead paint removal procedure to Engineer I Owner for approval prior to starting work.

Allow work inside a confined area when an individual is placed on the outside, for safety of those working inside. Engineer / Owner procedure for entry into a confined space must be followed.

#### 4.0 GENERAL

#### 4.1 Equipment, Labor and Services

All pressure containing vessels to comply with applicable federal provincial and municipal codes.

#### 4.2 Supervision

Deploy an experienced personnel authorized to act continually in charge of the work. Any authorized personnel who, in the judgment of Engineer / Owner, are negligent or incompetent will NOT be allowed to continue work at site and must be immediately replaced with qualified staff.

#### 4.3 Refuse

Keep the work area clean at all times, consistent with the type of work being performed.

#### 4.4 Access

Provide free and safe access to the work area at all times for Engineer's / Owner's inspector.



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## 4.5 Compressed Air

Provide compressed air supplies clean and free of oil or moisture. Install suitable filters and traps on the air compressor.

#### 4.6 Exceptions

No departure from these specifications is allowed unless directed by Engineer / Owner who has the right during the performance of this work to make alterations, providing such alterations are instituted before the particular work requiring changing is commenced, and also providing such alterations will not increase the cost. Any exceptions required by the Supplier must be presented in writing to Engineer / Owner as part of the tender documents or scope of work.

#### 5.0 TECHNICAL REQUIREMENTS

### 5.1 Surface Preparation

#### 5.1.1 Metal Surface Preparations

Prepare all metal surfaces free of gouges, handling marks, deep scratches, weld spatter, slivered steel, laminations, or other surface flaws. Repair such flaws before proceeding with the surface preparation.

Grind all sharp edges to a smooth radius of at least 3 mm.

#### 5.1.2 Abrasive Blasting

Remove all oil or greasy contamination according to the requirements of SSPC-SP1, Solvent Cleaning, prior to blast cleaning.

Blast clean all steel surfaces in accordance with the requirements of the SSPC surface preparation specification indicated in the painting schedule.

Use a clean, dry blasting abrasive to produce a surface profile conforming to the range specified in this Standard for the applicable coating system.

Avoid use of reclaimed abrasive for any final blast cleaning operations, except in the case where an automated blasting machine with an abrasive recovery system is used.

Discontinue blast cleaning operations for final surface preparation if steel temperatures are less than 3°C above the dew point, or if the relative humidity exceeds 80%.

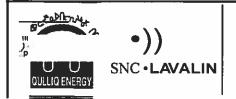
Use a vacuum operation or clean, dry compressed air blow down for Final Cleaning of surfaces.

Ensure the required degree of surface preparation specified as the appropriate coat of material is being applied. The ambient conditions to dictate the maximum time interval between blasting and painting to a maximum of four hours.

Continue into previously applied coatings a minimum of one inch when continuing with new work blasting.

#### 5.1.3 Other Surface Preparation Methods

Abrasive blasting is the best method of surface preparation. Where this is not possible for safety or economic reasons, use other methods, such as hydro blasting or abrasive-injected



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hydro blasting, depending on the type of surface preparation required and with the approval of Engineer / Owner.

Where hand or power tool cleaning is specified, follow the surface preparation specifications SSPC-SP2, Hand Tool Cleaning, SSPC-SP3, Power Tool Cleaning, and SSPC-SP11, Power Tool Cleaning to Bare Metal. The requirements of Section 6.5, the instructions on the coating manufacturer's published data sheets and the severity of the service intended to dictate which specification to follow.

Provide paint on the job in new, unopened containers. Materials older than the shelf life of the product will not be accepted. Damaged or previously opened containers will not be accepted.

Store, mix, thin, apply and cure print materials in accordance with the manufacturer's recommendations. The manufacturer's recommendations to take precedence over this standard, where applicable and approved by Engineer / Owner.

All paint to be power mixed. Mixing to be in accordance with the manufacturer's instruction. Component systems to be mixed in the proper ratios and allowed to set-up for the proper time prior to use, when a curi'ng agent / activator has been added.

Outdoor storage of painting materials and solvent is unacceptable. Protect painting materials from moisture, temperature extremes, contamination and damage.

Supply each paint material in the applied system from the same manufacturer and from the same batch number except where on site painting involves application over existing paints.

Suppliers not using the paint system defined by this specification must submit paint system(s) and applicable SSPC-SP surface cleaning specification(s) for Engineer / Owner approval prior to application.

The following minimum requirements to be complied:

- (a) Ensure that the paint system offered provide the same degree of corrosion protection as the Engineer / Owner specified system for the service location.
- (b) Ensure that the manufacturer's system provide at least six years of protection with less than one percentage failure, for the specified service and installed operating conditions.

#### 5.2 Paint Application

#### 5.2.1 General

In general, paint application to comply with specified standards. All prepared surfaces for coating to be primer coated before visible rusting occurs, or within four hours, whichever is sooner.

Spray tip selection to be based on the paint manufacturer's recommendation for their product.

No shop paint may be applied within 50 mm of welds prior to shop leak or pressure testing. Do not coat welded joints of field fabricated equipment and piping until after completion of field pressure testing.



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Surface preparation and paint application to be carried out by qualified and competent craft persons. Preference to be given to firms employing crafts persons who are certified through a recognized comprehensive training program.

All coatings to be applied by spray according to the manufacturer's published instructions unless prohibited. Where spray is prohibited, or is acceptable but would be ineffective due to the configuration of the surface, roller application or brushing will be accepted, but only for the area that cannot be sprayed. Welds, rivets and other surface irregularities to be stripe coated using a brush.

A blasted, un-coated strip having a minimum width of 100 mm to be left between primed and unblasted surfaces at the end of a workday.

Do not apply paint when the ambient temperature, substrate temperature or paint material temperature is outside the range recommended by the paint manufacturer. No coating with exception of inorganic zinc to be applied when relative humidity exceeds 80%, or if temperature of surface to be painted is less than 3 0°C above the dew point temperature. Likewise do not apply paints under adverse conditions or when such conditions are likely to occur before the paint has dried. Follow the coating manufacturer's recommendation when determining the acceptability of the conditions for the application of any coating.

Strictly follow the manufacturer's published curing schedule and surface temperatures, rather than ambient conditions. Allow each coating to cure sufficiently prior to application of a succeeding coat. The degree of cure to be determined using either a solvent wipe test or film hardness test.

To minimize inter-coat contamination, succeeding coats of paint to be applied with a minimum elapsed time between coats as recommended by the coating manufacturer. When unavoidable contamination does occur, contaminants must be sufficiently removed to ensure adequate inter-coat adhesion.

All coatings to be uniformly applied without sags, runs, or other defects. When such irregularity does exist it shall be removed and the area repainted.

Surfaces to be visually examined for contaminated or defectively applied areas and Dry Film Thickness to confirm compliance with this standard before application of the next coat. Loosely adhering or defectively applied paint shall be removed. The surface to be prepared to the original requirement and repainted using the same paint system. Edges to be feathered so that the new paint coating ties smoothly into the existing coating.

Edges, corners, crevices, welds and other complex shapes, which are particularly prone to rust attack, require careful attention to ensure they are properly prepared and coated. Evaluate the suitability to spraying these areas; stripe coating may be preferred over spraying.

#### 5.2.2 Coating and painting of new equipment & Engine Generator Sets

The painting of new equipment and Engine Generator Sets will be performed as per vendor standard, unless otherwise specified by the Client in the RFP. The vendor is required to submit their applicable painting system and procedure for Client's review and approval prior to start painting work.

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### 5.2.3 Coating and painting of piping, steel structure, hanger and supports

Paint and color code all new uninsulated pipes, pipe hangers, hanger rods, metal straps, brackets, steel structure and other exposed metal surfaces in the Power Plant and on site.

Paint surfaces in their entirety using applicable 3-coat finish system:

- 1) 1st coat-Red Oxide metal primer;
- 2) 2nd and 3rd coats-Industrial semi-gloss Enamel.
- 3) Paint exterior surfaces when outside temperature is greater than +7 0°C.
- 4) Touch-up any areas or surfaces damaged during construction to match existing, adjacent colors and sheen.
- 5) Paint all pipes which will be covered by insulation with 2 coats Red Oxide Primer only.

#### 5.2.4 Repair work and Recoating of damage surfaces

Prior to re-coating, repair all damage to the previous coat with the compatible coating. The completed coating must be free of defects.

#### Metal Finishes

- Interior-Formula 1: for primed ferrous metal surfaces apply.
  - o One coat spot priming CAN/CGSB-1.40
  - One coat enamel undercoat CAN/CGSB-1.38
  - o Two coats semi-gloss enamel CAN/CGSB-1.57
- Exterior-Formula 2 for primed ferrous metal surfaces apply.
  - o One coat spot priming CAN/CGSB-1.40
  - o One coat enamel undercoat CAN/CGSB-1.140 o

Two coats semi-gloss enamel CAN/CGSB-1.59

The following paint materials to be supplied by the Contractor for repair and touch-up work:

- Red Oide Primer
- Industrial semi-gloss enemel in the required colors for metal surfaces.

Any primers or paint for touch-up or repainting of damaged surfaces, must match the original paint sheen and type, and is to be supplied by the contractor.

Qualified products: only paint materials listed on the CGSB Qualified Products List are acceptable for use on this project.

Paint materials: to CGSB Standards listed in Finishing Formulae. Paint materials for each coating formulae to be products of a single manufacturer.

#### 5.2.5 Exclusions of painting surfaces

All piping, equipment and equipment supports to be painted in accordance with Section 5.3 of this document, except where otherwise indicated.

Do not paint the following surfaces, unless otherwise indicated:



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- a) Finished machine surfaces of equipment and components
- b) Any identification label, tag, sign, manufactures' name, data plates and gasket surfaces
- c) Brick, tile, concrete block, concrete foundation (unless exposed to chemical attack)
- d) Stainless steel (SS), copper, brass or aluminum and other nonferrous metal
- e) Galvanized metal and exterior surfaces of fireproofed structures and equipment
- f) Valve stems, seal glands, and control valve positioners
- g) Sprinkler heads and fusible links
- h) Aluminum or stainless steel sheathing over insulation
- i) Lining surfaces, fiberglass, PVC pipe, plastic and plastic coated materials
- j) Items which for various reasons may have special finishes applied by the manufacturer
- k) Internal surfaces of pipes are not painted unless otherwise specified
- I) Heating tubes and portions with heat resistant treatment of furnaces; boilers etc. are not be painted
- m) Insulated piping and equipment with operating temperature higher than 150°C (300°F)
- n) Underside of steel column base plates supported on concrete foundations
- o) Steel surfaces embedded in or bonded to concrete
- p) Stud welded shear connectors
- r) Traffic surface of crane rails

#### 5.2.6 Shop Painting

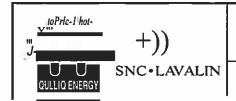
Paint all skid mounted package type units, rotary machinery and it's auxiliary equipment units, special machinery, misc. equipment, instrument and electrical equipment at manufacturer's shop with primer and finish painting system which is compatible with the operating conditions where the units or equipment are to be used. The manufacturer's standard can be applied, subject to approval by Engineer / Owner.

Supply all "off-the-shelf" or "stock" equipment items, such as pumps, valves, gauges, generators, electric motors, electrical and instrument components and gauges with the manufacturer's standard painting system at shop which is compatible with the operating conditions where the units or equipment items are to be used. The proposed system to be submitted to Engineer / Owner for approval.

#### 5.3 Coating Systems

Various paint manufacturer's products shown are considered to be generally equivalent and suitable for the intended service, it is recognized that differences do exist, and that the particular manufacturer's recommendations regarding a specific product should be carefully followed.

When requirements specified in the individual coating system are more stringent than those specified in the coating manufacturer's data sheets (e.g., surface preparation, anchor profile, etc.), the requirements specified herein govern.



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Shop repair of damaged or noncompliant coatings by re-blasting and re-application of the correct coating.

Unless otherwise indicated in the coating system notes, field repair of damaged or noncompliant coatings to be in accordance with Section 6.6 of this document.

The following coatings are acceptable for use at Qulliq Energy Corporation facilities.

#### 5.4 Piping

#### Locations:

- On long straight runs in open areas in boiler rooms, equipment rooms, galleries, and turnels so that at least one is dearly visible from any one viewpoint in operating areas or walking aides and not at more than 17 m intervals.
- Adjacent to all changes in direction.
- At least ance in each small roomthrough which piping passes.
- Or both sides of visual obstruction or where run is difficult to follow
- · On both sides of any separation such as walls, floors, and partitions.
- Where piping is concealed in pipe chase, ceiling space, gallery or other confined space, at entry and leaving points and adjacent to each access opening.
- At beginning and end points of each run and at each piece of equipment in run.
- At point immediately upstream of major manually operated or automatically controlled valves. Where this is not possible, place identification as dose to valve as possible, preferably on upstream side.

Provide easily and accurately readable legend from usual operating areas and all readily accessible points.

Provide plane of legend approximately at right angles to most convenient line of sight with consideration of operating positions, lighting conditions, reduced visibility of colour or legends caused by dust and dirt and risk of physical damage.

	PIPE IDENTIFICATION COLOURS					
Colour		Paint (Primary Colour)				
	CGSB:.! No.	Rustoleum No.	Description	(Secondary) 3M Vinyl Tape No. 471 <sup>1</sup>		
White	513-101	995	Federal Safety White-	White		
		2766	High Gloss White			
Black	512-101	978	Federal Safety Black	Black		
		634	High Gloss Black			
Grey	501 -108	906	Silver Grey			
Red	509-102	964	Federal Safety Red	Red		

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Orange	508-103	956	Federal Safety Orange	Orange
Yellow	505-110	944	Federal Safety Yellow <sup>1</sup>	Yellow
Green	503-126	933	Federal Safety Green <sup>1</sup>	Green
Blue	502-105	925	Federal Safety Blue <sup>1</sup>	Blue
Purple	511 -102	924	Federal Safety Purple <sup>1</sup>	Purple
Brown	504-103	977	Chestnut Brown	Brown
Aluminum	515-101	470	Aluminum	
		473	Heavy Duty Aluminum	
		4315	High Temperature Aluminum	
				Red-Orange;;s

Develop safety colors to meet ANSI and OSHA spec1f1cat1ons for colour cod1ng.

<sup>&</sup>lt;sup>3</sup> Used to identify pipe anchor points only.

PRIMARY COLOUR BAND SIZES				
O.D. of Pipe or Covering	Length of Band			
Up to and including 50 mm	300 mm			
63 mm to 175 mm	460 mm			
180 mm to 250 mm	610 mm			
Over 250 mm	810 mm			

PIPELINE IDENTIFICATION SCHEDULE				
SYSTEM	PRIMARY COLOUR	SECONDARY COLOUR		
WATER SYSTEMS				
Domestic Water (Potable) Identified by Labelling				
Raw Water (Rain, River, Sea Water)	Green	1.2		
Ethylene Glycol/Water (Engine Jacket Water)	Purple			
Propylene Glycol/Water (Secondary Systems, ie. Waste Heat Recovery Systems)	Purple	Yellow (1 Band)		
Treated Water (Boiler feed, Engine cooling where Glycol not used but inhibitors are added)	Blue			

<sup>&</sup>lt;sup>2</sup> Canadian Government Specification Board



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High Temperature Water (over 150°C)	Orange	
STEAM SYSTEMS		
Steam	Orange	
AIR SYSTEMS		
Compressed A ir - 0 to 100 kPa (0 to 15 psi)	White	
Compressed Air- 100 kPa to 2.07 MPa (15 to 300 psi)	White	Orange (1 Band)
Compressed A ir - 2.07 MPa to 6.90 MPa (300 to 1000 psi)	White	Orange (2 Bands)
FUEL SYSTEMS		
Diesel Fuel	Yellow	
Bunker Fuel	Yellow	Black (1 Band)
Natural gas	Yellow	Orange
Gasoline	Yellow	Red
(1 Band) OIL SYSTEMS		
Lube Oil (Clean)	Brown	
Lube Oil (Dirty)	Brown	Red (1 Band)
Hydraulic Pressure Actuating Oil 0 to 6.09 MPa (0 to 1000 psi)	Brown	Orange (1 Band)
Hydraulic Pressure Actuating Oil 6.09 to 21 MPa (1000 to 3000 psi)	Brown	Orange (2 Bands)
Transformer Cooling Oil	Brown	Blue (1 Band)
MISCELLANEOUS ENGINE SYSTEMS		
Air Intake Ducting	Aluminum	
Cooling Air Ducting (Plenum systems)	Aluminum	
Exhaust	none	
Crankcase Ventilation	Aluminum	
FIRE PROTECTION SYSTEMS		
Water	Red	
Steam	Red	Orange (1 Band)
Carbon Dioxide	Red	Blue (1 Band)
Halon	Red	Blue (1 Band)



ELECTRICAL CONDUIT		
Fire Protection	Aluminum	Red (1 Band)

#### 6.0 QUALITY ASSURANCE (QA)

#### 6.1 QA Requirements

A Daily Inspection Report (see Section 6.5) is attached for documenting that specified requirements have been met. The Daily Inspection Report to be completed for each work shift. The Supplier's forms may be used with prior approval from Engineer / Owner. A log to be maintained by the Supplier of all reports, inspections, and tests (including date, time, and results of instrument calibrations).

As a minimum, the following inspection functions are to be performed and documented for review by Engineer / Owner. The following documentation, in accordance with Section 6.2, must be available to Engineer / Owner at all times:

#### 6.1.1 Paint Materials

- a) Upon receipt, paint materials to be inspected for damage and compliance with the requirement of Engineer / Owner.
- b) Painting materials to be safely stored within the environmental conditions specified by manufacturer.
- c) Batch number to be recorded and shelf life expiration date to be confirmed.

#### 6.1.2 Surface Preparation

- a) Inspect the prepared surfaces to ensure that the required cleanliness and surface profile has been achieved. If cleanliness is in question, SSPC or ISO visual comparators are to be used to check cleanliness.
- b) Prepare substances in accordance with requirements of surface preparation of the CPCA Manual.
- c) No painting may start until all faulty conditions, defects, improper material, workmanship or other conditions, which in the opinion of Engineer / Owner will affect the satisfactory performance of the Supplier's work are resolved.

#### 6.1.3 Temperatures

- a) Record ambient and substrate temperatures at the start of work and at regular intervals.
- b) Paint exterior surfaces when outside temperature is greater than +7°C.

### 6.1.4 Air Supply

a) Frequent checks for oil and moisture in blast cleaning air supply

#### 6.1.5 Application

a) Commence application as soon as possible after surface preparation. Brush off and blast clean surfaces that show indications of rust bloom or contamination.



- b) Follow mixing, mixing ratios and induction time (if applicable).
- c) Evaluate atmospheric conditions. Do not apply paint when adverse weather conditions are likely to occur before the paint has dried.
- d) Do not exceed the "pot life" of the paint.
- e) Inspect the application technique for dry spray, over spray, under spray, runs, sags, and other defects. All prime, intermediate and finish coats to be inspected prior to the application of subsequent coats.
- f) After each coat, inspect the surfaces for runs, drips, sags, foreign inclusions, misses, appearance and dry film thickness. Protect adjacent surfaces from dripping and splattering.

#### 6.1.6 Curing

- a) Monitor the wet film thickness of each coat to ensure that the final OFT will be as per the specification.
- b) Measure dry Film Thickness (OFT) of each coat and of the total system using the procedure of SSPC-PA 2 and a properly calibrated magnetic gauge or eddy current gauge.

#### 6.1.7 Repairs

a) Inspect all repairs to ensure that they have been satisfactorily made.

#### 6.1.8 Defective Work

Rectify and repair any defective work which results from poor workmanship, use of defective materials, damage through carelessness or any other cause resulting from the Supplier's actions or omissions, found to exist prior to final acceptance of the work immediately when advised by the Engineer / Owner.

After shop or site clean-up, the surfaces to be inspected for damage.

The Supplier is responsible for making his own inspections after the completion of each work stage. Also measure and record the air temperature, relative humidity, surface temperature, dew point and other work area conditions that directly affect the application of coatings, immediately prior to the commencement of and during each coating application. Measurements that are not specifically in the work area are not acceptable.

#### 6.2 Supplier Records

Maintain a record of his inspections and submit this to Engineer *I* Owner, or their appointed coatings consultants, upon completion of the work.

This record to include the following:

- a) air temperature
- b) relative humidity
- c) steel temperature
- d) dew point in the work area during the application of each coat of the lining or exterior coating

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- e) type of paint used for each coat, with the batch numbers of each different lot of paint used
- f) dry film thickness measurements, and
- g) any other information relevant to the application of the lining or exterior coating.

All material furnished and work done is subject to thorough inspection by Engineer / Owner or their appointed coatings consultants. Do not proceed beyond the stage requiring inspection until the Engineer / Owner has made or waived inspection. Provide the Inspector with a schedule detailing each work stage with at least 48 hours notice during the course of the project when unscheduled inspections are required.

Inspection of Engineer / Owner does not relieve the Supplier of the responsibility for furnishing the qualified resources necessary to meet the requirements of the specification, or for making the required inspections. Present a copy of inspection records for review at the time of each inspection by Engineer / Owner or their appointed coatings consultants.

#### 6.3 Inspection Hold Points

Prior to commencement of blast operations, inspect the surfaces for the presence of oil, grease, or other contaminants that would not be adequately removed by abrasive blasting.

After blasting and before any coating is applied, inspect the surfaces to verify the quality of surface preparation.

After each coat, inspect the surfaces for runs, drips, sags, foreign inclusions, misses, appearance and dry film thickness.

After site clean up, inspect the surfaces for any damage.

## 6.4 Inspection Instruments

Measure metal temperature with a surface thermometer, in intimate contact with the surface.

Measure Relative Humidity with a sling psychrometer. Note that this instrument can also be used for measuring the air temperature.

Measure Wet Film Thickness with a Nordson Wet Film thickness gauge or an equivalent instrument approved by the Engineer / Client.

Measure Dry Film Thickness with a Mikrotest magnetic pull-off gauge or an equivalent instrument approved by the Engineer / Client. Note that these instruments need to be calibrated for the film thickness to be measured and require frequent monitoring to check for drift from the calibration setting.

### 6.5 Daily Inspection Report

Complete the Daily Inspection Report form attached in Annex-I for each work shift to verify compliance with this standard.

Record unsatisfactory work, conditions, causing unsatisfactory work, and corrective action.

Attach copies of all replica tape readings taken.

Attach additional sheets, notes of meetings, or reports as necessary for back up.

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Submit a copy of all forms and back-up documents to Engineer / Client.

#### 6.6 Field touch-up and repair procedures

### 6.6.1 Field Weld Areas and Damaged Coatings Exposing Bare Metal or Rust

Field weld areas and damaged coatings showing bare metal or rust to be solvent cleaned, followed by power tool cleaning to restore steel to the required degree of cleanliness. All loose, cracked and damaged coating to be removed. The prepared surface to be free of loose or blistered coating.

After surface preparation is complete, provide touch-up as follows:

- (a) Touch-up for surfaces which consist of a primer and finish coating to be with the application of two or more coats (as required to achieve the required overall coating thickness) of the finish coating that was used in the original coating system.
- (b) Touch-up for surfaces that were only primed with inorganic zinc to be done with the application of surface tolerant heat resistant modified silicone zinc.

The finish color and gloss to match, as close as practical, to the adjacent surfaces. However, differences in color and gloss will be noticeable and are considered acceptable.

#### 6.6.2 Damaged Coatings Not Exposing Bare Metal or Rust

Damage to coatings not exposing bare metal to be solvent cleaned per SSPC-SP 1, followed by hand or power tool cleaning per SSPC-SP 2 or 3. All gloss shall be removed and the surface abraded without removing the primer.

After surface preparation is complete, apply one or more touch-up coats (as required to achieve the required overall coating thickness) to achieve the finish coating that was used in the original coating system.

Match the finish color and gloss, as close as practical, the adjacent surfaces. However, differences in color and gloss will be noticeable and are considered acceptable.

#### 6.7 Performance Criteria and Performance Guarantee

Provide the minimum warranty period of six years from the date of application. Where superior coatings are used the warranty period may be extended through negotiation with the paint supplier and applicator. Provide written warranty including the following:

- a) The coating applicator warrants that the surface preparation and coating system application shall follow the specifications and/or manufacturers' instructions as set forth in the manufacturers' data sheets.
- b) The manufacturer warrants that the coating system be free from deterioration due to peeling, blistering, uneven fading or color change, excessive surface erosion or weathering or other forms of coating failure which can be directly attributed to a coating system breakdown, for the warranty period.
- c) Inspection to be made jointly by representatives of Engineer / Client, the paint manufacturer and coating applicator at the end of the first year, or at a time or times mutually agreeable to all parties, depending on the length of the warranty period. Final inspection will be carried out at the end of the warranty period. Areas of coating

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requing repair to be carried out in a manner mutually agreed upon, and at a time convenient to Engineer / Owner.

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## APPENDIX I - DAILY INSPECTION REPORT FORM

Supplier:			Date:			Page:	of	
Item No.:				Coated: CS	Ot	her	<b>.</b>	
Condition	Star	t of Blasting	Start of F	200	Mid-Point C		of Painting	
	0.0.1	. o. b.aog		aa	Painting	2.10	or r amang	
Time			1					
Ambient Temper	ature		1					
(DC)								
Relative Humidit	y(%)							
Dew Point					<del></del>			
Temperature (DC	)							
Substrate								
Temperature (DC	,							
Weather Condition	ons							
Surface Preparation: Condition of Surface Prior to Blasting: Method of Removing Contamination Prior to Blasting: Method of Blasting: Degree of Cleanliness Obtained: Anchor Profile (mm):  Application Information Method of Spraying: DFT Gage Type and Model:  Date Calibrated:								
Coatings	Coating	Batch No.	Coating	Thinner	OFT	OFT	Actual	
	Applied		Colour	No./Type	Specified	Obtained	Overcoat	
				Used	(micron)	(micron)	Interval	
							(hrs)	
Primer								
Intermediate								
Finish	<u> </u>							
Comments:								
Supplier's Signature:								
Engineer / Client Signature:								

**DOCUMENT END**