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SECTION I: ORGANIZATION, POLICY AND PROCEDURES

A. SENIOR MANAGER RESPONSIBILITIES

I. PURPOSE

To outline the areas of responsibilities for Senior Managers of Jacob & Samuel Drilling Ltd. as it relates to the Safety, Health, and Loss Control Program.

II. SCOPE

This policy is applicable to all Senior Managers of Jacob & Samuel Drilling Ltd. on all projects operated solely by, or any other segment venture with another company. For the purpose of this section, Senior Manager is intended to include the Company President, Vice-President, Operations Managers, Support Service Managers, Personnel Managers, and Safety Managers.

III. RESPONSIBILITY

- Senior Managers shall have the same responsibility for safety and health programs as for any other segment of the operations.
- Senior Managers shall require all members of the staff to observe and enforce all safety rules and procedures.
- Senior Managers shall provide adequate equipment, tools, and protective devices, and shall insist upon the proper use and maintenance of that equipment and devices.
- Senior Managers are, at all times, ultimately responsible for the execution of the work in a safe manner. They will be held accountable for all incidents and employee actions unless investigations indicate that the cause was beyond their direct control.
- Senior Managers shall fully investigate all incidents involving any company personnel, equipment, or materials, and take proper remedial actions to prevent the occurrence of similar accidents.
- Senior Managers shall fully understand the safety rules and the procedures of the company and shall comply with them.

- Senior Managers shall ensure that all new employees are instructed in the reporting procedures for all accidents, incidents, and injuries.
- The Safety Manager will investigate any public liability accident or any injury occurring to a Company employee, during their week of responsibility.
- The Safety Manager will review a random sample of 5-Point Safety System from each project, and will provide feedback to selected employees, based on the review of these cards, during their week of responsibility.

B. DRILLING SUPERVISOR/FOREMAN RESPONSIBILITIES

I. PURPOSE

To outline the areas of responsibilities for Drilling Supervisors/Foremen as it relates to the Safety, Health, and Loss Control Program of Jacob & Samuel Drilling Ltd.

II. SCOPE

This policy is applicable to all Drilling Supervisors/Designees of Jacob & Samuel Drilling Ltd. on all projects operated solely by or as a joint venture with another company.

III. RESPONSIBILITY

- The Drilling Supervisor is responsible to develop in employees a high level of safety awareness with respect to themselves and their fellow employees.
- Employees are to be informed of and comply with government legislation affecting occupational health and work place area responsibility.
- Promptly and efficiently investigate any accident or incident resulting in personal injury, occupational illness or any property damage that could have resulted in personal injury or any unsafe practice reported by an employee. The purpose of such an investigation is to determine objectively the underlying cause and to take appropriate actions to minimize a recurrence.

- To conduct safety discussions at least weekly and record them on a form provided for this purpose. Minimum duration of these safety talks should be 10-15 minutes long. To ensure daily pre-shift jobsite and equipment checks, and documentation of these, daily.
- To ensure that all project employees are knowledgeable of and active participants of the 5-Point Safety System.
- To report all injuries without delay using appropriate forms and telephone contacts.
- To conduct site inspections monthly and complete inspection reports provided for this purpose. All remedial actions must be corrected in order of priority.
- To indoctrinate all new transferred employees. To introduce them to the existing Jacob & Samuel Drilling Ltd. Safety and Loss Control Programs, achievements and current objectives.
- To coordinate any emergency occurrence on the project site and to follow up with a report.
- To enforce the use of personal protective equipment when and where required.
- To provide adequate equipment and tools are available, and for proper inspection of all tools and equipment, including an employee's personal tools if used on a work site.
- Drilling Supervisors/Foremen shall make certain that no task is assigned to an employee who is not trained and capable of performing the work safely. Physical capability determination may include a review of the physician's written opinion, a part of the company medical surveillance program.
- To produce timely reports and others pertaining to the project administration such as
 - Time sheets
 - Progress reports
 - Periodical bonus reports
 - Monthly reports
 - Other reports as instructed by the Division Manager or by the senior executives.

- Liaison with the provincial governments and obtain all the necessary permits and certifications required for this project site.
- To ensure the safety and health of employees under his supervision.

C. EMPLOYEE RESPONSIBILITIES

I. PURPOSE

To identify the specific responsibilities of each employee of Jacob & Samuel Drilling Ltd., relating to safety and health policies and procedures.

II. SCOPE

This policy pertains to all employees of Jacob & Samuel Drilling Ltd. and employees working under the direction of our supervision even though they may not be paid directly by Jacob & Samuel Drilling Ltd.

III. RESPONSIBILITY

- It is the responsibility of each employee, while at work, to conduct them such that they:
 1. Assure their own safety by following all of the rules set forth by the company.
 2. Assure the safety of their fellow workers.
 3. Assure the protection of Company property, and public and private property of others.
- It is the responsibility of each employee to report any and all accidents, incidents, and unsafe conditions or actions that they may have witnessed or are made aware of, to their supervisor or foreman, or to someone in charge of their work at the job site. This includes the responsibility to report near-miss situations.
- If any employee believes that a work assignment is unsafe, or the equipment is unsafe, the employee shall not begin work until the conditions have been reported to the supervisor and the unsafe condition is safely resolved.
- It is the responsibility of each employee to ensure subcontractors are following all safety rules and to report all infractions to the Project Manager.

- It is the responsibility of each employee to participate in the company safety awareness and training programs, including the daily completion of the 5-Point Safety System.

D. EMPLOYEE SELECTION AND TRAINING

I. PURPOSE

To define general guidelines for selecting and training employees who can work safely.

II. SCOPE

These requirements apply to all employees of Jacob & Samuel Drilling Ltd.

III. REQUIREMENTS

All employees will be required to review, understand, and sign an acknowledgment of the Employee Handbook containing Jacob & Samuel Drilling Ltd. Policy on Safety, Health, and Loss Control.

A. Employee Selection

- Prior Experience Inquiry - Determination of work experience and equipment operated in previous employment are part of the pre-employment process.
- Pre-employment Drug Test - A condition of employment will be a clear pre-employment drug test.

B. Training Programs

- Job Training - Certain positions may require specific training programs, such as additional safety training for assignments involving hazardous materials, hazardous waste, or work on mine property. In addition, on-the-job training programs may be instituted where applicable.
- Training Requirements - Each employee will have WHMIS, First Aid and Common Core before entering any job sites.

- Probation - During each employee's initial period of employment, work safety and driving habits will be monitored by immediate supervisor or foreman. Observations, both positive and negative, will be documented and filed in the employee's personnel file.
- Performance Review - During performance reviews, all accidents involving the employee will be analyzed, critiqued, and documented to identify precautions that could or should have been taken to prevent the accident(s).

C. Discipline

All disciplinary action relative to safety violations will be equitable and progressive. Reprimands for violations of safety rules and procedures and for unsafe work practices will be documented and a copy maintained in the personnel file.

Serious or willful violations may be subject to immediate discharge, outside the progressive discipline policy.

E. ACCIDENT/INCIDENT REPORTING PROCEDURES

I. PURPOSE

To establish a procedure for the prompt and accurate reporting of accidents and incidents which are consistent with the company policy and applicable Federal, Provincial, and local regulations.

II. SCOPE

This procedure applies to all Jacob & Samuel Drilling Ltd. Project Managers must ensure subcontractors have an established accident report procedure.

III. PROCEDURE

It shall be the responsibility of the Supervisory personnel at the job site or company facility to promptly and accurately report accidents and incidents which involve employees, vehicles, property and cargo which are owned, rented or otherwise under the control of the company. Employees involved in an accident while working alone at a job site must report the accident to their supervisor immediately and to the Safety Officer within 24 hours.

Details of the proper reporting procedures, depending on the type and severity (actual or potential) of the event, are outline in this procedure.

Strict adherence to the reporting requirements, both verbal and written, is essential.

PROCEDURE FOR ACCIDENT/INCIDENT REPORTING

- The procedure of reporting each accident or incident is similar. It is essential that all accidents and incidents be reported, no matter how slight they may seem.
- After the Supervisor is advised by the employee, the Supervisor must contact the Safety Officer.
- Telephone reports to the Company are to be made by the Supervisor as soon as he /she learns of the accident/incident.
- Written reports on the Company forms must be submitted as soon as possible following the occurrence of the accident/incident. If full details cannot be obtained, a report marked "Preliminary Report" at the top should be submitted within specified times, followed by a final report as soon as possible.
- Essay or narrative reports are to be submitted as requested by management and in all accidents involving a fatality or lost workdays (not including the day of the injury/illness).
- Government agencies may require a telephone and/or written report. When this occurs, specific instructions will be made available. Where the contract requires written reports to the client, the safety manager will make these available.

F. SAFETY MEETINGS/TOOLBOX SESSIONS

I. PURPOSE

To define minimum requirements for scheduling and holding of safety meetings and toolbox sessions for all employees.

II. SCOPE

These requirements apply to all job sites.

III. REQUIREMENTS

Project Managers at each job site and project site shall schedule and hold an informal toolbox safety meeting for all employees prior to beginning

work each day. On a weekly basis, the Project Manager will hold a safety meeting, take attendance and report the attendance and discussion to the Safety Director. In addition, the Safety Director shall schedule and conduct safety meetings at regular intervals.

A. Attendance

- Attendance is mandatory for daily toolbox safety meetings.
- It is recognized that, due to scheduling, it may be impossible for all employees to attend a company safety meeting at one time. If a significant number of personnel are unavailable to attend one scheduled meeting, a second meeting shall be scheduled during each month covering the subject matter. When only a few employees will be unable to attend the regularly scheduled meeting, it shall be sufficient to provide those employees a copy of the minutes of the meeting.
- Employees arriving late for the toolbox safety meeting will be individually briefed on the significant safety issues prior to commencing work.
- Employees who are to be absent from their normal operations location (vacation, sick leave, leave of absence, etc.) during the time when regularly scheduled meetings are held, shall be provided with copies of the minutes.

B. The Meeting

- Subject Matter

The subject matter of each meeting shall be dictated by the needs of each operational project or job site. When new or modified company policy or procedures must be communicated, it shall be part of the subject matter of safety meetings at all job sites or facilities.

When training is part of the subject matter, whether new or refresher training, employees receiving the training must date and sign or initial the appropriate training record form at the close of the meeting.

Details of all serious or potentially serious accidents shall be part of subject matter of the next regular scheduled safety meeting. Most importantly, causes and corrective actions, taken or recommended, shall be communicated.

- Record Keeping
Minutes of each safety meeting must be kept. This is to include subject matter, training, establishment or interpretation of company policies, procedures, work rules, etc. Answer to questions that may affect all employees should be included in the minutes.

Employees attending safety meetings must sign an attendance record that shall become part of the file copy of the minutes. Acknowledgment must be in the employees' handwriting. Employees who receive a copy of the minutes in lieu of attendance must also sign the attendance record.

When training, either new or refresher, is part of the meeting content, appropriate entries must be made in employee training records. Where signatures or initials are required, training records should be brought to the meeting and signed and initialed at that time.

G. 5-POINT SAFETY SYSTEM

I. PURPOSE

To ensure that each field, warehouse/storage yard, or repair shop employee is refocused on safety, prior to the start of each shift worked

II. SCOPE

These requirements apply to all job sites, warehouse/storage yards, and repair shops.

III. REQUIREMENTS

- Participation is mandatory in the 5-Point Safety System program.
- At the start of each shift, each employee will fully complete their 5-Point Safety System sheet, will perform an act of safety as required, and document that act of safety. They will also commit, in writing, to work safely during the upcoming shift.
- The 5-Point Safety System sheet will be checked and signed off by the employee's direct supervisor. If appropriate, the direct supervisor will discuss the content of the 5-Point Safety System with the employee.

- A random sample of 5-Point Safety System will be taken from each project by the senior safety manager each week, and reviewed for content, commitment and comments. If appropriate, the senior safety manager will respond to the employee in writing, with comments about the employees 5-Point Safety System.

SECTION II: GENERAL WORK RULES

A. RESPONSIBILITY TO THE ENVIRONMENT

I. PURPOSE

To establish the safety policy of Jacob & Samuel Drilling Ltd. and employees regarding responsibility to the environment.

II. SCOPE

This policy applies to all employees.

III. RESPONSIBILITY

Our continuation in business, and our growth, depends on us operating in the field without damaging the environment in which we work. Concern for the environment is not something we can leave to our client or to Government environmental authorities. It has to be one of our major concerns, hour by hour in the field.

There are, therefore, a number of procedures that we must follow on all jobs.

- A. To protect the environment.
- B. To remedy and report any damages which may occur.

These include:

1. The building of berms and/or the placing of poly tarps around any fuel lubricant storage that we maintain at our drill sites. We must be especially aware that a spill into a stream or any surface water source is much more difficult to contain than a ground spill. Accordingly we must locate fuel and oil storage tanks as far as possible from any water source.

2. The immediate cleaning up of any spill, major or minor, or fuel, hydraulic fluid, or lubricant on the grounds adjacent to the drill site. When transferring fuel from one tank to another, it is imperative that the operation be monitored at all times and not left unattended.
3. The disposals of used drill mud and fluids are to be done only in a manner and in location advised by our clients. In general, while we are responsible for disposing of used mud, it is up to our clients to arrange just how and where this should be done.
4. Maintaining a tidy and clean environment at the site at all times. This will include placing all cans, wrappers, etc., in a garbage container, and daily clean up around the site area. When the site is abandoned, it must be restored, as closely as possible, to the original condition.
5. We should be careful about the impact of noise, lights, etc. on any dwelling adjacent to a drill site.
6. In the event of any spill - fuel, lubricants, hydraulic oil, or any other fluid, for any reason - accident, vandalism, equipment failure, or any other cause, immediate action is to be taken to contain the spills, to remove and properly dispose of all contaminated materials, and most importantly to advise your supervisor and/or client's representative.

B. RESPONSIBILITY TO THE PUBLIC

I. PURPOSE

To establish the safety policy of Jacob & Samuel Drilling Ltd. and employees regarding responsibility to the Public.

II. SCOPE

This policy applies to all employees.

III. RESPONSIBILITY

All employees shall use care and appropriate or necessary measures to ensure the protection and well being of public persons and property at all times.

The job site shall be inspected daily prior to beginning work, and any existing damages to public property, shall be reported to the Client Contact, and shall be noted on the Daily Field Report.

All company vehicles and equipment shall be operated in a safe and secure manner.

C. PERSONAL CONDUCT

I. PURPOSE

To identify the expected minimum standards of personal conduct for all employees of Jacob & Samuel Drilling Ltd.

II. SCOPE

This policy applies to all employees of Jacob & Samuel Drilling Ltd.

III. POLICY

Violation of any of the following rules will subject the employee to disciplinary actions up to and including dismissal.

- A. The use of INTOXICATING ALCOHOL or NON-PRESCRIPTION DRUGS during or before working hours, or on Jacob & Samuel Drilling Ltd. property is strictly prohibited. Where prescription drugs include cautions concerning their use, employees shall advise their Supervisor of any restrictions that may affect employee or public safety.
- B. It shall be the Project Manager/Supervisor responsibility to immediately report any employee who reports for work under the influence of alcohol or drugs. Any Project Manager/Supervisor who allows an employee to work under the influence of alcohol or drugs, or who permits the use of alcohol or drugs, shall also be subject to disciplinary action.
- C. Horseplay shall not be permitted during working hours or on the job site.
- D. All employees shall remember that they are representatives of the Company. No work or action of theirs shall create an unfavorable opinion in minds of the customer, client, or public.

D. DISCIPLINARY ACTION

I. PURPOSE

The objective of the Jacob & Samuel Drilling Ltd. Safety, Health, and Loss Control Program is to provide a safe working environment, and to protect the well being of the employees and the public. This procedure provides for the establishment of a disciplinary action program for the Company relative to Safety Policies and Procedures. Strict enforcement of all safety rules and procedures is essential to the achievements of the objective.

II. SCOPE

This policy applies to all employees of Jacob & Samuel Drilling Ltd.

III. POLICY

The Safety Policies, Procedures, and Rules shall be considered the same as any other work rule or condition, and shall be adhered to as a condition for employment. Management shall enforce safety policies, procedures, and rules.

Any employee not complying with the Safety Policies, Procedures, and Rules as they are established as part of this Manual, the Employee Handbook, or as verbally instructed, shall be subject to counseling, reprimand and/or dismissal.

SECTION III. EMPLOYEE HEALTH

A. DRUG AND ALCOHOL POLICY

Jacob & Samuel Drilling Ltd. has a very strict drug-Free workplace policy. In brief, our policy is:

Pre-employment, Random, and Post-accident 9-panel (9 drugs) testing.

Upon receipt of a positive test:

- Immediate DISCHARGE
- Loss of benefits (Health Insurance, vacation, bonus and seniority)
- Employee not eligible for re-hire until completion of a drug treatment or counseling program.
- Eligible for re-hire four months after discharge (treatment must be complete)

- Re-hire only at Company discretion (no guarantee of renewed employment).
- Clean drug test prior to return to work.

During the period of discharge, the employee is expected to seek counseling and complete the recommended course of treatment.

Re-hire is entirely at Company discretion. If the employee is re-hired, that employee must agree to frequent unannounced drug tests.

A second positive result in a drug test will result in automatic dismissal with no re-hire.

B. FIRST AID

First Aid training shall be conducted for all field employees and designated head office staff, conducted by a qualified instructor and shall include:

Principles of responding to a health emergency
 Methods of surveying the scene and the victim(s)
 Basic Adult Cardiopulmonary Resuscitation (CPR)
 Basic First Aid Intervention
 Universal Precautions
 First Aid Supplies
 Trainee Assessments

FIRST AID KITS

First aid kits shall include at a minimum, the following items:

1. Gauze pads (at least 4 x 4 inches).
2. Two large gauze pads (at least 8 x 10 inches).
3. Box adhesive bandages (Band-Aids).
4. One package gauze roller bandage at least 2 inches wide.
5. Two triangular bandages.
6. Wound cleaning agent such as sealed moistened towelettes.
7. Scissors.
8. At least one blanket.
9. Tweezers.
10. Adhesive tape.
11. Latex gloves.
12. Two elastic wraps.
13. Splint.
14. Directions for requesting emergency assistance.

C. HAZARD COMMUNICATION PLAN

The following Hazard Communication Plan has been established and is available for review by all employees, along with the applicable MSDS's.

1. HAZARD DETERMINATION

Jacob & Samuel Drilling Ltd. will be relying on Material Safety Data Sheets from suppliers to meet hazard determination requirements.

2. LABELLING

- A. The Warehouse Supervisor will be responsible for seeing that all containers/products coming in are properly labeled and that labels are updated when suppliers provide new information.
- B. All labels shall be checked for:
 - Identity;
 - Hazard Warning; and
 - Name and Address of Supplier.
- C. For portable containers used by more than one person, proper labels obtained from the supplier or labels prepared in-house will be applied by employee filling container.

3. MATERIAL SAFETY DATA SHEETS (MSDS).

- A. The Safety Department will be responsible for obtaining MSDS where none exist and for compiling the Master MSDS file. A second MSDS file will be kept in the Right-to-Know carrying case found in the Shop Foreman's Office.
- B. When the MSDS is not received with the first shipment of a hazardous material, the Purchasing Agent will call the supplier and request one. This will be followed by a letter that confirms the request.
- C. When a new MSDS is received from a supplier, it will be placed immediately in the MSDS file.
- D. MSDS's will be available for review by all employees during all shifts. Employees may review an MSDS by contacting their Supervisor or Safety Department.

4. TRAINING

- A. Personnel/Safety Director will be responsible for conducting all the Right-to-Know training programs.
- B. The training will consist of classroom sessions or a video, and Material Safety Data Sheets.
- C. The training program will cover;
 - Legal requirements;
 - How to use labels and MSDS's;
 - Physical and health hazards of chemicals in the workplace;
 - Controlling hazardous materials;
 - Detecting hazardous materials;
 - Work practices, including mixing chemicals and the hazards of confined spaces; and
 - Emergency response.
- D. Before starting work, each new employee will receive the information and training described above.
- E. Before any new hazardous material is introduced into the workplace, MSDS sheets will be posted so each employee will be aware of the hazards of the material and the precautions that must be taken.
- F. Attendance will be taken at all hazardous material training sessions. The Safety Department will keep these records.

5. HAZARDOUS NON-ROUTINE TASKS

- A. Sometimes employees may be required to do work that is not part of their normal routine, such as working in a confined space. The confined space entry procedures contained in the Jacob & Samuel Drilling Ltd. Safety Manual will be followed.
- B. It is the policy of Jacob & Samuel Drilling Ltd. that no employee will begin on any non routine task without first receiving a hazard briefing.

D. FALL PROTECTION

I. PURPOSE

To prevent work related injuries that may be incurred from falls from heights. Jacob & Samuel Drilling Ltd. recognizes that disabling and fatal injury occurs with regularity at elevations above six feet (1.8 meters). Hence we will adopt the SIX-FOOT RULE (1.8 meters).

The prevention of these incidents will be accomplished through a Total Systems Approach including, but not limited to -

- Fall prevention by Elimination of the Hazard
- Effective Fall Protection Methods and Equipment
- Training of all affected employees
- Proper enforcement by all field Management Staff

II. SCOPE

This policy applies to all company employees working on all Jacob & Samuel Drilling Ltd. Projects who may be exposed to fall hazards in excess of SIX FEET (1.8 meters) in their daily activities on the job. This program also applies to non-site personnel, visitors and individuals on site exposed to the same fall hazard and all sub-contractors.

III. SAFETY GOALS AND OBJECTIVES

MANAGEMENT - The goal of management is to reduce the frequency of fall related injuries to ZERO on all of Jacob & Samuel Drilling Ltd.'s Projects. This will be accomplished through proper training, effective administration, cost controls, enforcement, and evaluation of incidents and use of the Safety and Loss Program Elements that are in effect. Management will continually monitor and modify the fall protection measures until the ZERO FREQUENCY OBJECTIVE is attained and maintained in all its operations.

SUPERVISION - The goal of supervision will be to ensure compliance with the "Fall Prevention Program", by enforcement of these requirements, prompt hazard recognition and correction and ensuring that all affected personnel in their charge are competently trained, skilled and compliant with the procedures in place.

EMPLOYEES - Employees have the specific goal to follow the Fall Protection procedures in force on their site at all times. Their status will be maintained through:

- Employees will have the knowledge to properly identify fall hazards.
- Employees will have the training to work safely in hazardous areas.
- Employees will have the skills to properly wear and inspect personal equipment.
- Employees will demonstrate the will to follow the Fall Protection Procedures.

IV. INSPECTIONS

All employees are required to do pre-start daily inspection. Should any worker discover a Fall Hazard not properly controlled or find defects or deficiencies in his equipment then the work SHALL NOT PROCEED, until his immediate supervisor is notified, inspects the scene, and corrects the condition. If they cannot agree that the correction is appropriate then work will remain stopped until managerial and/or regulatory permission is given. We empower all workers with the right to refuse dangerous work, indeed it is their obligation.

E. FIRE PROTECTION

FIRE PREVENTION PROGRAM

I. PURPOSE

The Company Fire Safety Plan has been developed to work in conjunction with company emergency plans and other safety programs. This includes reviewing all new building construction and renovations to ensure compliance with applicable state, local, and national fire and life safety standards. Fire prevention measures reduce the incidence of fires by eliminating opportunities for ignition of flammable materials.

II. RESPONSIBILITIES

Management

- Ensure all fire prevention methods are established and enforced
- Ensure fire suppression systems such as sprinklers and extinguishers are periodically inspected and maintained to a high degree of working order

- Train supervisors to use fire extinguishers for incipient fires
- Train employees on evacuation routes and procedures

Supervisors

- Closely monitor the use of flammable materials and liquids
- Train assigned employees in the safe storage, use and handling of flammable materials
- Ensure flammable material storage areas are properly maintained

Employees

- Use, store and transfer flammable materials in accordance with provided training
- Do not mix flammable materials
- Immediately report violations of the Fire Safety Program

Hazards

Fire and explosion hazards can exist in almost any work area. Potential hazards include:

- Improper operation or maintenance of gas fired equipment
- Improper storage or use of flammable liquids
- Smoking in prohibited areas
- Accumulation of trash
- Unauthorized Hot Work operations

Hazard Control

Elimination of Ignition Sources

All nonessential ignition sources must be eliminated where flammable liquids are used or stored. The following is a list of some of the more common potential ignition sources:

- Open flames, such as cutting and welding torches, furnaces, matches, and heaters-these sources should be kept away from flammable liquids operations. Cutting or welding on flammable liquids equipment should not be performed unless the equipment has been properly emptied and purged with a neutral gas such as nitrogen.
- Chemical sources of ignition such as D.C. motors, switched, and circuit breakers-these sources should be eliminated where flammable liquids are handled or stored. Only approved explosion-proof devices should be used in these areas.

- Mechanical sparks-these sparks can be produced as a result of friction. Only non-sparking tools should be used in areas where flammable liquids are stored or handled.
- Static sparks-these sparks can be generated as a result of electron transfer between two contacting surfaces. The electrons can discharge in a small volume, raising the temperature to above the ignition temperature. Every effort should be made to eliminate the possibility of static sparks. Also proper bonding and grounding procedures must be followed when flammable liquids are transferred or transported.

Removal of Incompatibles

Materials that can contribute to a flammable liquid fire should not be stored with flammable liquids. Examples are oxidizers and organic peroxides, which, on decomposition, can generate large amounts of oxygen.

Control of Flammable Gases

Generally, flammable gases pose the same type of fire hazards as flammable liquids and their vapors. Many of the safeguards for flammable liquids also apply to flammable gases, other properties such as toxicity, reactivity, and corrosivity also must be taken into account. Also, a gas that is flammable could produce toxic combustion products.

Fire Extinguishers

A portable fire extinguisher is a "first aid" device and is very effective when used while the fire is small. The use of fire extinguisher that matches the class of fire, by a person who is well trained, can save both lives and property. Portable fire extinguishers must be installed in workplaces regardless of other firefighting measures. The successful performance of a fire extinguisher in a fire situation largely depends on its proper selection, inspection, maintenance, and distribution.

Classification of Fires and Selection of Extinguishers

Fires are classified into four general categories depending on the type of material or fuel involved. The type of fire determines the type of extinguisher that should be used to extinguish it.

- 1) Class A fires involve materials such as wood, paper, and cloth which produce glowing embers or char.
- 2) Class B fires involve flammable gases, liquids, and greases, including gasoline and most hydrocarbon liquids, which must be vaporized for combustion to occur.
- 3) Class C fires involve fires in live electrical equipment or in materials near electrically powered equipment.
- 4) Class D fires involve combustible metals, such as magnesium, zirconium, potassium, and sodium.

Extinguishers will be selected according to the potential fire hazard, the construction and occupancy of facilities, hazard to be protected, and other factors pertinent to the situation.

Location and Marking of Extinguishers

Extinguishers will be conspicuously located and readily accessible for immediate use in the event of fire. They will be located along normal paths of travel and egress. Wall recesses and/or flush-mounted cabinets will be used as extinguisher locations whenever possible.

Extinguishers will be clearly visible. In locations where visual obstruction cannot be completely avoided, directional arrows will be provided to indicate the location of extinguishers and the arrows will be marked with the extinguisher classification.

If extinguishers intended for different classes of fire are located together, they will be conspicuously marked to ensure that the proper class extinguisher selection is made at the time of a fire. Extinguisher classification markings will be located on the front of the shell above or below the extinguisher nameplate. Markings will be of a size and form to be legible from a distance of 3 feet (1 meter).

Condition

Portable extinguishers will be maintained in a fully charged and operable condition. They will be kept in their designated locations at all times when not being used. When extinguishers are removed for maintenance or testing, a fully charged and operable replacement unit will be provided.

Mounting and Distribution of Extinguishers

Extinguishers will be installed on hangers, brackets, in cabinets, or on shelves. Extinguishers having a gross weight not exceeding 40 pounds (18 kgs) will be so installed that the top of the extinguisher is not more than 3-1/2 feet (1-0.15 meters) above the floor.

Extinguishers mounted in cabinets or wall recesses or set on shelves will be placed so that the extinguisher operating instructions face outward. The location of such extinguishers will be made conspicuous by marking the cabinet or wall recess in a contrasting color that will distinguish it from the normal decor.

Extinguishers must be distributed in such a way that the amount of time needed to travel to their location and back to the fire does not allow the fire to get out of control. OSHA requires that the travel distance for Class A and Class D extinguishers not exceed 75 feet (23 meters). The maximum travel distance for Class B extinguishers is 50 feet (15 meters) because flammable liquid fires can get out of control faster than Class A fires. There is no maximum travel distance specified for Class C extinguishers, but they must be distributed on the basis of appropriate patterns for Class A and B hazards.

Inspection and Maintenance

Once an extinguisher is selected, purchased, and installed, it is the responsibility of the safety department to oversee the inspection, maintenance, and testing of fire extinguishers to ensure that they are in proper working condition and have not been tampered with or physically damaged.

Fire Safety Inspections & Housekeeping

First line supervisors and Safety Committees are responsible for conducting work site surveys that include observations of compliance with the Fire Safety Program. Surveys should include observations of worksite safety and housekeeping issues and should specifically address proper storage of chemicals and supplies, unobstructed access to fire extinguishers, and emergency evacuation routes. They should determine if an emergency evacuation plan is present in work areas and that personnel are familiar with the plan.

Emergency Exits

Every exit will be clearly visible, or the route to it conspicuously identified in such a manner that every occupant of the building will readily know the direction of escape from any point. At no time will exits be blocked.

Any doorway or passageway which is not an exit or access to an exit but which may be mistaken for an exit will be identified by a sign reading "Not An Exit" or a sign indicating its actual use (i.e., "Storeroom"). A readily visible sign will mark exits and accesses to exits. Each exit sign (other than internally illuminated signs) will be illuminated by a reliable light source providing not less than 5 foot (1.5 meters)-candles on the illuminated surface.

Emergency Plan for Persons with Disabilities

The first line supervisor is assigned the responsibility to assist Persons with Disabilities (PWD) under their supervision. The supervisor will choose an alternate assistant. The role of the two assistants is to report to their assigned person, and to either assist in evacuation or assure that the PWD is removed from danger.

- Supervisors, alternates, and the person with a disability will be trained on available escape routes and methods.
- A list of persons with disabilities is kept in the Human Resources Office.
- Visitors who have disabilities will be assisted in a manner similar to that of company employees. The Host of the person with disabilities will assist in their evacuation.

Emergencies Involving Fire

Fire Alarms

In the event of a fire emergency, a fire alarm will sound for the building.

Evacuation Routes and Plans

Each facility shall have an emergency evacuation plan.

Should evacuation be necessary, go to the nearest exit or stairway and proceed to an area of refuge outside the building. Most stairways are fire resistant and present barriers to smoke if the doors are kept closed.

Do not use elevators. Should the fire involve the control panel of the elevator or the electrical system of the building, power in the building may be cut and you could be trapped between floors. Also, the elevator shaft can become a flue, lending itself to the passage and accumulation of hot gases and smoke generated by the fire.

Emergency Coordinators/Supervisors

Emergency Coordinators/Supervisors will be responsible for verifying personnel have evacuated from their assigned areas.

Fire Emergency Procedures

If you discover a fire

- Activate the nearest fire alarm. (*Or follow your branch fire alert procedure*)
- Notify your Supervisor and other occupants.

Fight the fire ONLY if

- The fire department has been notified of the fire, AND
- The fire is small and confined to its area of origin, AND
- You have a way out and can fight the fire with your back to the exit, AND
- You have the proper extinguisher, in good working order, AND know how to use it.
- If you are not sure of your ability or the fire extinguisher's capacity to contain the fire, leave the area.

If you hear a fire alarm

1. Evacuate the area. Close windows, turn off gas jets, and close doors as you leave.
2. Leave the building and move away from exits and out of the way of emergency operations.
3. Assemble in a designated area
4. Report to the monitor so he/she can determine that all personnel have evacuated your area.
5. Remain outside until competent authority states that it is safe to re-enter

Evacuation Routes

1. Learn at least two escape routes, and emergency exits from your area.
2. Never use an elevator as part of your escape route.
3. Learn to activate a fire alarm.
4. Learn to recognize alarm sounds.
5. Take an active part in fire evacuation drills.

Fire and Emergency Action Plan Moncton Facility

In the event of fire:

Fight fire only if safe to do so.

Call 911 only if safe to do so.

Sound alarm verbally to your co-workers.

Calmly evacuate the building.

Assemble in front of the building (across parking lot) for a head-count.

Department heads will be responsible for departmental head counts, which will then be reported to the Shop Manager or Human Resource Director or their representatives.

Exits are:

- Main building exit.
- Rear building exit.
- Warehouse personnel may exit through the warehouse door.
- Shop personnel may exit through bay doors.
- During regular work hours, other employees may use shop or warehouse exits.

F. PERSONAL PROTECTIVE EQUIPMENT

Personal protective equipment is required on all Jacob & Samuel Drilling Ltd projects and in our shop area. The specific requirements may vary according to the work performed, but the hazard assessment for drilling and shop work published below shall apply as a minimum.

Certification of Hazard Assessment

Work Area _____ Drill Rig _____

Assessment Conducted By _____ Date _____

Personal Protective Equipment - Hazard Analysis - By Task

Task	Hazard	PPE Required	Notes	Departments
Work area hazards	Crushing, tripping, foot lacerations	Steel-toed boots	At all times	All personnel
Work area hazards	Blowing dust, metal shards from impact	Safety Glasses	At all times	All personnel
Entering High Noise Area	Hearing Loss	Foam, cap, or earmuff type hearing protection	Both ears, all production areas, prior to plant entry	All personnel
Working on drill rig	Overhead hazards	ANSI approved hard hat	Properly fitted and maintained	Shop, field
Mud / Cement Mixing	Caustic Burns	Gloves, safety glasses, sleeves, dust mask if necessary	Only authorized employees are to mix chemicals	Authorized Employees
First Aid	Blood borne Pathogens	Latex examination gloves, CPR mask if CPR is performed	Immediate notification if exposed to body fluids. See Blood borne Pathogen Control Program	First Aid Staff
Grinding, Sanding, Chipping, Abrading	Eye hazard	Safety Glasses/Goggles Face Shield		Maintenance and field employees
Grinding, Sanding, Chipping, Abrading.,	Hand lacerations, impingement	Leather or thick cloth work gloves	When using powered tools	Maintenance and field employees
Welding, Brazing	Eye hazard, burns	Welder helmet, apron, gloves, chaps	See selection chart for proper lens shade	Maintenance and field employees

SECTION IV: SAFETY RULES AND PROCEDURES

A. SAFETY AWARENESS

I. PURPOSE

The purpose of Safety awareness is to develop an attitude that will foster safe and healthy working relationships within the company.

II. SCOPE

This policy applies to all employees.

III. POLICY

- A. No task to be accomplished is more important than the health and safety of our employees and the public.
- B. Each task, regardless of size or location, should be approached with the goal of safe accomplishment.
- C. Employees are expected to look for hazards and work with Project Managers to eliminate or mitigate them.
- D. Employees who will ask questions when in doubt, instead of leaping into a potentially hazardous situation, are valued assets.
- E. All employees will use the 5-point Safety System. The cards are to be filled out daily and reviewed by the supervisor on the project before being forwarded to the Moncton office.

B. HEAD AND EYE PROTECTION

I. PURPOSE

To prevent injuries to the head and eyes resulting from contact with chemicals or other physical agents.

II. SCOPE

This policy applies to all employees.

III. POLICY

- A. Approved hard hats and safety glasses shall be provided to all employees, and shall be worn at all times while working or while present on the job site.
- B. All employees shall wear hard hats in the vicinity of drill rigs and other heavy equipment operations, and in all construction areas, demolition areas or remedial operations.
- C. Project Managers shall require subcontractors to wear hard hats in the vicinity of drill rigs and other heavy equipment operations, and in all construction areas, demolition areas or remedial operations.
- D. All employees must wear eye or face protective equipment when working on job sites or any work where there is possibility of injury to eye or face. This includes but not limited to, riveting, grinding, and chipping steel or concrete, working in dusty places or materials.
- E. Visitors to the job site must be provided visitors' safety glasses or goggles (over prescription lenses) in all areas of the site where eye protection is required for employees.

C. OTHER PROTECTIVE EQUIPMENT

I. PURPOSE

To describe the policy and procedure for the utilization of other protective equipment.

II. SCOPE

This policy applies to all employees.

III. PROCEDURE

Other protective equipment such as gloves, toe guards, hearing protection, safety shoes, boots, protective clothing, etc., will be provided for employees.

These items will be discussed in detail in site safety training. For example:

- A. Safety boots must be worn when in the vicinity of drill rig, heavy equipment, also in the work shop.

- B. Hearing protection must be worn at all times at drill rig and other places where the sound level in the work area exceeds the minimum permissible exposure level.
- C. Work gloves are to be worn to prevent injuries that can cause puncture, abrade, burns or irritate the skin, except when the use of gloves introduces greater hazards.

D. BURNING AND WELDING PROCEDURE

Hot Work Safety Procedures

Purpose

Welding and Hot Work, such as brazing or grinding present a significant opportunity for fire and injury. All precautions of this program must be applied prior to commencing any welding or hot work by company employees or contractors. Reference: OSHA 29 CFR 1910.252

Responsibilities

Management

- Provide training for all employees whose task include heat, spark or flame producing operations such as welding, brazing, or grinding.
- Develop and monitor effective hot work procedures
- Provide safe equipment for hot work
- Provide proper and effective PPE for all hot work

Supervisors

- Monitor all hot work operations
- Ensure all hot work equipment and PPE are in safe working order
- Allow only trained and authorized employees to conduct hot work
- Ensure permits are used for all hot work outside authorized areas

Employees

- Follow all hot work procedures
- Properly use appropriate hot work PPE
- Inspect all hot work equipment before use
- Report any equipment problems
- Not use damaged hot work equipment

Definitions

Welding/Hot Works Procedures: any activity which results in sparks, fire, molten slag, or hot material which has the potential to cause fires or explosions.

Examples of Hot Works: Cutting, Brazing, Soldering, Thawing Pipes, Torch Applied Roofing, Grinding and Welding.

Special Hazard Occupancies: Any area containing Flammable Liquids, Dust Accumulation, Gases, Plastics, Rubber and Paper products.

Hazards

- Fires & Explosions
- Skin burns
- Welding "blindness"
- Respiratory hazards from fumes & smoke

Training

Training shall include:

- Review of requirements listed in OSHA 1910.252
- Use of Hot Works Permit System
- Supervisor Responsibilities
- Fire Watch Responsibilities – specifically, the fire watch must know:
 1. That their ONLY duty is Fire Watch
 2. When they can terminate the watch
 3. How to use the provided fire extinguisher
 4. How to activate fire alarm if fire is beyond the incipient stage
- Operator Responsibilities
- Contractors Responsibilities
- Documentation requirements
- Respirator Usage requirements
- Fire Extinguisher training

Hot Works Procedures

OSHA 29 CFR 1910.252 required fire prevention actions for welding/hot works.

Where practicable all combustibles shall be relocated at least 35 feet (10 meters) from the work site. **Where relocation is impractical, combustibles shall be protected with flame proof covers, shielded with metal, guards, curtains, or wet down material to help prevent ignition of material.**

Ducts, conveyor systems, and augers that might carry sparks to distant combustibles **shall be protected or shut down.**

Where cutting or welding is done near walls, partitions, ceilings, or a roof of combustible construction, fire-resistant shields or guards shall be provided to prevent ignition.

If welding is to be done on a metal wall, partition, ceiling, or roof, precautions shall be taken to prevent ignition of combustibles on the other side, due to conduction or radiation of heat. **Where combustibles cannot be relocated on the opposite side of the work, a fire watch person shall be provided on the opposite side of the work.**

Welding shall not be attempted on a metal partition, wall, ceiling or roof having a covering nor on walls having combustible sandwich panel construction.

Cutting or welding on pipes or other metal in contact with combustible walls, partitions, ceilings, or roofs shall not be undertaken if the work is close enough to cause ignition by combustion.

Cutting or welding shall not be permitted in the following situations:

In areas not authorized by management.

In sprinkled buildings while such protection is impaired.

In the presence of potentially explosive atmospheres, e.g.. a flammable

In areas near the storage of large quantities of exposed, readily ignitable materials.

In areas where there is dust accumulation of greater than 1/16 inch within 35 feet of the area where welding hot works will be conducted. *All dust accumulation should be cleaned up following the housekeeping program of the facility before welding/hot works are permitted.*

Suitable extinguishers shall be provided and maintained ready for instant use.

A fire watch person shall be provided during and for 2 hours past the completion of the welding project.

A cutting/welding permit will be issued on all welding or cutting outside of the designated welding area.

Welding & Hot Work fire prevention measures

A designated welding area should be established to meet them following requirements:

- a) Floors swept and clean of combustibles within 35 ft. (10 meters) of work area.
- b) Flammable and combustible liquids and material will be kept 35 ft. (10 meters) from work area.
- c) Adequate ventilation providing 20 air changes per hour, such as a suction hood system should be provided to the work area.
- d) At least one 10 lb. (4.5 kgs) dry chemical fire extinguisher should be within access of the 35 ft. (10 meters) of work area.
- e) Protective dividers such as welding curtains or non-combustible walls will be provided to contain sparks and slag to the combustible free area.

Requirements for welding conducted outside the designated welding area.

- a) Portable welding curtains or shields must be used to protect other workers in the welding area.

- b) A hot works permit must be completed and complied with prior to welding operation.
- c) Respiratory protection is mandatory unless an adequate monitored air flow away from the welder and others present can be established and maintained.
- d) Plastic materials be covered with welding tarps during welding procedures
- e) Fire Watch must be provided for all hot work operations.

Welding Standard Operating Procedures

The following pages list the *Welding Standard Operating Procedures* (SOP) and are applicable for all electric and gas welding. These SOPs are to be posted at each Designated Welding & Hot Work Area for quick reference and review.

SOP - Electric Welding

Perform Safety Check on all equipment

Ensure fire extinguisher is charged and available

Ensure electrical cord, electrode holder and cables are free from defects (no cable splices are allowed within 10 feet (3 meters) of the electrode holder.

Ensure PPE (welding hood, gloves, rubber boots/soled shoes, aprons) are available and have no defects.

Ensure the welding unit is properly grounded.

All defective equipment must be repaired or replaced before use.

Remove flammables and combustibles

No welding is permitted on or near containers of flammable material, combustible material or unprotected flammable structures.

Place welding screen or suitable barricade around work area to provide a fire safety zone and prevent injuries to passersby (Do not block emergency exits or restrict ventilation)

Ensure Adequate Ventilation and Lighting

Execute Hot Work Permit procedures

Set Voltage Regulator

No higher than the following for:

Manual Alternating Current Welders - 80 volts

Automatic Alternating Current Welders - 100 volts

Manual or automatic Direct Current Welders -100 volts

Uncoil and spread out welding cable

To avoid overheating, ensure proper contact of work leads and connections, remove any metal fragments from magnetic work clamps (to avoid electric shock do not wrap welding cables around a body part and avoid welding in wet conditions)

Fire watch for one hour after welding & until all welds have cooled

Perform final fire watch and terminate permit.

SOP: Gas Welding

Perform Safety Check on all equipment

Ensure tanks have gas and fittings are tight

Ensure fire extinguisher is charged and available

Ensure hoses have no defects

Ensure PPE (welding hood, gloves, rubber boots/soled shoes, aprons) are available and have no defects.

All defective equipment must be repaired or replace before uses.

Remove flammables and combustibles

No welding is permitted on or near containers of flammable material, combustible material or unprotected flammable structures.

Place welding screen or suitable barricade around work area to provide a fire safety zone and prevent injuries to passersby (Do not block emergency exits or restrict ventilation)

Ensure Adequate Ventilation and Lighting

Execute Hot Work Permit procedures

Open Valves on Oxygen and Gas tanks to desired flow

Shut Tank Valves & relieve hose pressure. Store hoses

Fire watch for one hour after welding & until all welds have cooled

Perform final fire watch and terminate permit.

E. WARNING SIGNS. GUARDS. BARRIERS. CONES. ETC.

I. PURPOSE

To prescribe the requirements for the use of appropriate warning signs and devices a project site.

II. SCOPE

This procedure applies to all appropriate job sites.

III. PROCEDURE

A. General Requirements

Approved warning signs, barriers, guards, flags, "Men at Work", signs, flares, and lights at night, shall be installed and properly maintained whenever hazards exist due to construction work along thoroughfares. Reasonable inspection of such lights and flares shall be made to see that they are lighted and properly maintained. Local ordinances may require special permits from public works or state highway department.

Such warnings shall be placed immediately at the point of excavations, obstructions, and other hazards. In addition, they shall be placed sufficiently far in advance and to the rear of the operations to provide adequate notice to approaching motorist, and pedestrians

F. SAFE USE OF EQUIPMENT

I. PURPOSE

To provide procedures to ensure the safe operations of equipment.

II. SCOPE

This procedure applies to all employees.

III. PROCEDURE

- A. All employees shall be clear of equipment before starting. Equipment operators shall perform a complete walk around inspection before starting equipment.
- B. All engines must be shut down prior to refueling.
- C. No adjustments, cleaning, or repairs shall be made to equipment while the equipment is running. All exposed gears, sprockets, chain drives, and belt and pulley drives shall have guards replaced directly following repairs, lubrication, cleaning, or similar operations.
- D. Only trained employees are permitted to operate equipment.
- E. No equipment shall be left with the engine running on an inclined surface.
- F. All four wheels will be kept on the ground during loading.
- G. Materials piles shall only be approached at a speed necessary to fill the bucket.
- H. The bucket or blade shall be grounded when equipment is to be left unattended, even if for a short time.
- I. No eating, reading, or daydreaming while engaged in the operations of heavy equipment. Equipment shall not be operated if the operator is physically unfit.
- J. The operator supervising the lift or unloading shall only recognize hand signals.

- K. Clearances and other environmental conditions shall be checked when working near electrical wires, guy lines, or structures. Avoid contact of drill with rig boom or cables with lines, electrical wire, and structures. At no time will equipment booms operate within 10 feet (3 meters) or high voltage overhead power lines.
- L. Operators will inspect equipment daily to ensure that it is in good working order, and all safety equipment is operational. This includes brakes, horn, alarms, etc
- M. Gasoline shall not be stored on the equipment.
- N. An appropriately sized class B fire extinguisher will be readily available whenever gasoline/diesel operated equipment is in use.
- O. All equipment shall be kept clean and orderly. The operator and the supervisor shall routinely inspect cabs for cleanliness. Seat belts shall be worn at all times.
- P. Load limits of the equipment shall be restricted observed.
- Q. The operator will be the only person allowed on the equipment. NO PASSENGERS.
- R. Compressed air hoses and connections require careful handling. All hoses should be secured (tied down) to prevent whipping. Ensure safety wire is used on hose connections. Carefully inspect all hoses prior to use for signs. of wear/crimping/or worn connectors prior to use.

G. MATERIAL HANDLING EQUIPMENT

I. PURPOSE

To establish the basic safety standards for employees using material handling equipment.

II. SCOPE

This procedure applies to all employees.

III. PROCEDURE

A. Powered Industrial Lift trucks (Forklifts)

All operators of forklifts must complete the course for the appropriate lift truck. Training for a different class or lift truck is not transferable.

H. JOB VEHICLES

I. PURPOSE

To establish the basic safety rules for employees assigned to operate job vans/trucks.

II. SCOPE

This procedure applies to all employees.

III. PROCEDURE

1. All occupants must wear vehicle safety belts at all times. Drivers must not drive away until all are buckled in. This will be enforced. Managers and supervisors will issue one warning only, will suspend for a second offense, and will refer to Head Office for disciplinary action for a subsequent offense.
2. Obey the speed limit and reduce speed when weather or road conditions dictate. Chains will be required off road in designated areas in winter conditions.
3. No alcoholic beverages will be carried in any Jacob & Samuel Drilling Ltd. vehicle at any time, and must not be consumed before or during driving.
4. Be courteous to other drivers, be courteous and cooperative with client's security staff, and obey all site security and driving rules.
5. Drive a Jacob & Samuel Drilling Ltd. vehicle only with proper permission from your supervisor. Do not pick up hitchhikers or offer rides to non-company personnel.
6. Ensure vehicles are in safe condition to operate, are clean and all routine service checks (oil, coolant level, tire pressure, etc.) have been made. Report any concerns to your supervisor.

7. Oil, water, and brakes shall be checked before starting the engine.
8. Before moving any van/truck, a check clearance around the vehicle from any obstructions or personnel shall be performed. Walk around the van/truck.
9. Drivers shall, unless specifically instructed, exit the cab when the truck is being loaded.
10. Overloading of van/trailers shall be prohibited.
11. Passengers are allowed only on approved passengers' seats
12. Always set the hand brakes and lock ignition before leaving the van/truck at the end of the shift.
13. All regulations and traffic laws shall be strictly obeyed.
14. The driver is responsible for securing all loads from shifting or falling. Compressed gas cylinders must be chained upright and capped.
15. Do not drive faster than 30 MPH (48km/h) with water in the trailer.
16. Following distance should be increased when carrying heavy loads, or when the trailer is full.

I. SHOP SAFETY RULES

I. PURPOSE

To establish the basic safety and work rules for employees working in the shop area.

II. SCOPE

This procedure applies to all employees.

III. PROCEDURES AND WORK RULES

A. Tools and Equipment

Always use the proper tool for the job.

Be sure that striking tools (punches or chisels) are not mushroomed or burred.

Replace broken, splintered, or loose handles.

Do not use a torch to cut into a tank or barrel.

General Rules

Do not work under equipment unless properly blocked. Do not rely solely on the jack, cable, or hydraulics.

Do not clean or attempt repairs while equipment is in motion.

Use safety goggles or face shield when grinding, chipping, or brazing.

Use proper goggles and helmet when using torch or arc welding equipment.

Never watch an arc welder unless you are wearing the proper welder's glasses. Watching the glare without proper tinted glasses could cause permanent blindness.

When starting an engine, or motor, be sure that everything and everyone is clear.

Hard hats shall be worn.

No smoking during fueling operations, or when working with battery or where batteries are being charged.

Clean up after each shift. Be sure there is a place for everything and keep everything in its place.

No horse plays, scuffling, fighting, or gambling.

Be sure to study your job and all existing conditions around you.

Be sure to report every accident or injury, no matter how slight, to your immediate supervisor.

Lock-out Tag-out Plan

Purpose

Control of Hazardous energy is the purpose of the Lock-out- Tag-out Program. This program establishes the requirements for isolation of both

kinetic and potential electrical, chemical, thermal, hydraulic and pneumatic and gravitational energy prior to equipment repair, adjustment or removal.

Hazards - Improper or failure to use Lock-out – Tag-out procedures may result in:

- Electrical shock
- Chemical exposure
- Skin burns
- Lacerations & amputation
- Fires & explosions
- Chemical releases
- Eye injury
- Death

Hazard Controls

- Only authorized and trained employees may engage in tasks that require use of lock-out-tag-out procedures
- All equipment has single sources of electrical power
- Lock-out procedures have been developed for all equipment and processes
- Restoration from Lock-out is a controlled operation

Definitions

Authorized (Qualified) Employees are the only ones certified to lock and tag-out equipment or machinery. Whether an employee is considered to be qualified will depend upon various circumstances in the workplace. It is likely for an individual to be considered "qualified" with regard to certain equipment in the workplace, but "unqualified" as to other equipment. An employee who is undergoing on-the-job training and who, in the course of such training, has demonstrated an ability to perform duties safely at his or her level of training and who is under the direct supervision of a qualified person, is considered to be "qualified" for the performance of those duties.

Affected Employees are those employees who operate machinery or equipment upon which lock-out or tagging out is required under this program. Training of these individuals will be less stringent in that it will include the purpose and use of the lock-out procedures.

Other Employees are identified as those that do not fall into the authorized, affected or qualified employee category. Essentially, it will include all other employees. These employees will be provided instruction

in what the program is and not to touch any machine or equipment when they see that it has been locked or tagged out.

Training

Authorized Employees Training

All Maintenance Employees, Department Supervisors and Janitorial employees will be trained to use the Lock and Tag-out Procedures. The training will be conducted by the Maintenance Supervisor, Safety Manager or Project Supervisor at time of initial hire. Retraining shall be held at least annually. The training will consist of the following:

1. Review of General Procedures
2. Review of Specific Procedures for machinery, equipment and processes
3. Location and use of Specific Procedures
4. Procedures when questions arise

Affected Employee Training

1. Only trained and authorized Employees will repair, replace or adjust machinery, equipment or processes
2. Affected Employees may not remove Locks, locking devices or tags from machinery, equipment or circuits.
3. Purpose and use of the lock-out procedures.

Other Employee Training

1. Only trained and authorized Employees will repair, replace or adjust machinery or equipment.
2. Other Employees may not remove Locks, locking devices or tags from machinery, equipment or circuits

Preparation for Lock and Tag-Out Procedures

A Lock-out – Tag-out survey has been conducted to locate and identify all energy sources to verify which switches or valves supply energy to machinery and equipment. Dual or redundant controls have been removed.

Routine Maintenance & Machine Adjustments

Lock and Tag-out procedures are not required if equipment must be operating for proper adjustment. This rare exception may be used only by

trained and authorized Employees when specific procedures have been developed to safely avoid hazards with proper training. All consideration shall be made to prevent the need for an employee to break the plane of a normally guarded area of the equipment by use of tools and other devices.

Adjustments and Machine Testing

When adjustments and machine testing are necessary while performing routine maintenance or repairs, the qualified mechanic or the supervisor must perform the following steps:

- Clear the area of tools and parts.
- Verify that all persons are clear, both through visual inspection (walk around large equipment) and by shouting "Clear" 10 seconds prior to startup.
- Replace any guards or covers not necessary to adjustment and testing.
- Remove the tag or lock.
- Energize.
- Test and adjust.
- De-energize.
- Replace remaining covers and guards OR
- Reapply Lock-out tag-out.

Locks, Hasps and Tags

All Qualified Maintenance Personnel will be assigned a lock with one key, hasp and tag. All locks will be keyed differently, except when a specific individual is issues a series of locks for complex lock-out-tag-out tasks. In some cases, more than one lock, hasp and tag are needed to completely de-energize equipment and machinery.

Additional locks may be checked out from the Department or Maintenance Supervisor on a shift-by-shift basis. All locks and hasps shall be uniquely identifiable to a specific employee. Tags will contain Name of person tagging equipment, date and reason for tagging.

SOP: General Lock and Tag-Out Procedures

Before working on, repairing, adjusting or replacing machinery and equipment, the following procedures will be utilized to place the machinery and equipment in a neutral or zero mechanical state.

Preparation for Shutdown. Before authorized or affected employees turn off a machine or piece of equipment, the authorized employee will have knowledge of the type and magnitude of the energy, the hazards of the energy to be controlled, and the means to control the energy.

Notify all affected Employees that the machinery, equipment or process will be out of service

Machine or Equipment Shutdown. The machine or equipment will be turned or shut down using the specific procedures for that specific machine. An orderly shutdown will be utilized to avoid any additional or increased hazards to employees as a result of equipment de-energization.

If the machinery, equipment or process is in operation, follow normal stopping procedures (depress stop button, open toggle switch, etc.).

Move switch or panel arms to "Off" or "Open" positions and close all valves or other energy isolating devices so that the energy source(s) is disconnected or isolated from the machinery or equipment.

Machine or Equipment Isolation.

All energy control devices that are needed to control the energy to the machine or equipment will be physically located and operated in such a manner as to isolate the machine or equipment from the energy source.

Lock-out or Tag-out Device Application.

Lock-out or tag-out devices will be affixed to energy isolating devices by authorized employees. Lockout devices will be affixed in a manner that will hold the energy isolating devices from the "safe" or "off" position.

Where tag-out devices are used they will be affixed in such a manner that will clearly state that the operation or the movement of energy isolating devices from the "safe" or "off" positions is prohibited.

The tag-out devices will be attached to the same point a lock would be attached. If the tag cannot be affixed at that point, the tag will be located as close as possible to the device in a position that will be immediately obvious to anyone attempting to operate the device.

Lock and tag-out all energy devices by use of hasps, chains and valve covers with an assigned individual locks.

Stored Energy

Following the application of the lockout or tag-out devices to the energy isolating devices, all potential or residual energy will be relieved, disconnected, restrained, and otherwise rendered safe.

Where the re-accumulation of stored energy to a hazardous energy level is possible, verification of isolation will be continued until the maintenance or servicing is complete.

Release stored energy (capacitors, springs, elevated members, rotating fly wheels, and hydraulic/air/gas/steam systems) must be relieved or restrained by grounding, repositioning, blocking and/or bleeding the system.

Verification of Isolation

Prior to starting work on machines or equipment that have been locked or tagged out, the authorized employees will verify that isolation or de-energizing of the machine or equipment have been accomplished.

After assuring that no Employee will be placed in danger, test all lock and tag outs by following the normal start up procedures (depress start button, etc.).

Caution: After Test, place controls in neutral position.

Extended Lock-out – Tag-out

Should the shift change before the machinery or equipment can be restored to service, the lock and tag-out must remain. If the task is reassigned to the next shift, those Employees must lock and tag-out before the previous shift may remove their lock and tag.

SOP: Release from LOCK-OUT/ TAG-OUT

Before lock-out or tag-out devices are removed and the energy restored to the machine or equipment, the following actions will be taken:

1. The work area will be thoroughly inspected to ensure that nonessential items have been removed and that machine or equipment components are operational.
2. The work area will be checked to ensure that all employees have been safely positioned or removed. Before the lock-out or tag-out devices are removed, the affected employees will be notified that the lock-out or tag-out devices are being removed.
3. Each lock-out or tag-out device will be removed from each energy isolating device by the employee who applied the device.

SOP: LOTO Procedure for Electrical Plug-Type Equipment

1. This procedure covers all Electrical Plug-Type Equipment such as Battery Chargers, some Product Pumps, Office Equipment, Powered Hand Tools, Powered Bench Tools, Lathes, Fans, etc.
2. When working on, repairing, or adjusting the above equipment, the following procedures must be utilized to prevent accidental or sudden startup:
3. Unplug Electrical Equipment from wall socket or in-line socket.
4. Attach "Do Not Operate" Tag and Plug Box & Lock on end of power cord.

An exception is granted to not lock & tag the plug if the cord & plug remain in the exclusive control of the Employee working on, adjusting or inspecting the equipment.

5. Test Equipment to assure power source has been removed by depressing the "Start" or "On" Switch.
6. Perform required operations.
7. Replace all guards removed.
8. Remove Lock & Plug Box and Tag.

9. Inspect power cord and socket before plugging equipment into power source. Any defects must be repaired before placing the equipment back in service.

NOTE: Occasionally used equipment may be unplugged from power source when not in use.

SOP: LOTO Procedures Involving More Than One Employee

In the preceding SOPs, if more than one Employee is assigned to a task requiring a lock and tag-out, each must also place his or her own lock and tag on the energy isolating device(s).

SOP: Management's Removal of Lock and Tag-Out

Only the Employee that locks and tags out machinery, equipment or processes may remove his/her lock and tag. However, should the Employee leave the facility before removing his/her lock and tag, the Maintenance Manager may remove the lock and tag. The Maintenance Manager must be assured that all tools have been removed, all guards have been replaced and all Employees are free from any hazard before the lock and tag are removed and the machinery, equipment or process are returned to service. Notification of the employee who placed the lock is required prior to lock removal.

Contractors

Contractors, working on company property and equipment must use this Lock-out Tag-out procedure while servicing or maintaining equipment, machinery or processes.

J. DRILLING OPERATIONS

I. PURPOSE

To provide safety procedures to be observed during drilling operations.

II. SCOPE

This procedure applies to all employees who are involved with drilling operations.

III. PROCEDURES AND WORK RULES

1. Safety inspection of the drill rig and overall site layout will be made before drilling commences.
 - This inspection should ensure that all crewmembers are properly equipped and that the condition of all equipment is safe and in good working order.
 - All guards and safety devices will be in place before commencing operations.
 - Floors, stairs, and workbenches will be free of grease, mud, and trash.
 - Flammable gases and oil will be in proper containers and correctly stored.
2. Hard hats, safety shoes/boots, safety glasses, hearing protection, and gloves are mandatory for all drilling operations or any person who is in the vicinity of drilling operations.
3. Although site safety training should address the use of protective eye equipment, the following operations require goggles/eye shields:
 - ~ Driving pins in or out of drive chains
 - ~ Replacing keys in tongs
 - ~ Handling hazardous liquids
 - ~ Renewing or tightening gauge glasses
 - ~ Breaking concrete, brick or cast iron
 - ~ Cleaning materials with chemical solutions
 - ~ Hammering or sledging on hard objects
 - ~ Cutting wire lines
 - ~ Grinding
 - ~ Handling materials in powdered or semi-powdered form
 - ~ Scraping metal surfaces
 - ~ Sledging rock bits or core heads to loosen or tighten them
 - ~ Driving and holding rivets.
4. Shirts are required at all times. Shirts should have long sleeves.
5. All equipment will maintain a minimum of 20 feet (6 meters) from electric wires.

6. Up hole procedures

We are occasionally asked by our clients to drill up holes from an underground drill station. This can be a hazardous task and requires additional cautions and a modification of usual drill procedures.

The greatest danger involves a mis-latched inner tube or rock caving from the hole walls sliding back down the rods and exiting the open end. These items can travel with such force that they go right through any guards in place. A latch head traveling with such force can seriously injure or kill a driller or helper.

Open-ended rods in any up hole should be treated as carefully as a loaded gun. The drill crew is to ensure that neither they nor any drill station visitor ever enter the trajectory of items exiting the drill rods.

Driller and helper will maintain constant close communication. Helper will travel around rear of drill only when specifically authorized to do so by the driller. The driller will only give this authorization when he is certain the water swivel is securely threaded to the drill rod.

The tube will be removed from the rods when tripping rods in or out. In the event a tube is stuck in the rods, necessitating a rod trip, all persons in the area shall be advised to remain clear of the back of the drill.

The other hazard when drilling up holes is the introduction of water into the formation. Crews must be especially vigilant of the condition of the back and must test the back with a scaling bar and bar down whenever necessary.

There is also a possibility that the rod-clamping mechanism of the rig may fail, allowing the drill pipe to fall uncontrolled from the borehole. The drill crew must keep an exit path clear for all members of the drill crew, such that all persons in a drill station can exit the station without passing anywhere in front of the open end of the rods.

K. PROPER LIFTING TECHNIQUES

I. PURPOSE

To establish the basic principles of lifting safety.

II. SCOPE

This procedure is applicable to all employees.

III. PROCEDURE

1. Do not attempt to lift beyond your capabilities. Get some help. Lifting is not just a matter of weight, it can be hazardous with lighter objects with an awkward shape or in a position that requires an awkward stance.
2. When mechanical lifting equipment is available, use it.
3. Check out the route for clearances and sure footing before initiating a lift to carry.
4. Inspect the objects to decide how to place your hands for a good grip. Avoid sharp-edges, or other things that could cause injury.
5. Use the following safe lifting techniques:
 - Lift with your feet apart, at least the width of your shoulders. Ensure you have a solid level surface. One foot should be along side the load, the other directly under your spine.
 - Always lift with the spine straight. The spine is engineered for strength only when it is near vertical. If the spine is bent, your muscles, spine, and internal organs can receive excessive strain.
 - Tuck your chin in. this will ensure the neck is properly aligned. Tuck your elbows and arms in as well.
 - Assume a squatting position with your hands as near your body as the load will allow.

- Initiate the lift by pushing off with the rear foot. Never twist while lifting or setting down the load. Set it down as near your body position as possible.

L. RIGGING AND INSPECTION

I. PURPOSE

To establish the basic principles of rigging safety.

II. SCOPE

This procedure is applicable to all employees.

III. PROCEDURE

1. All equipment shall be used within applicable limits. Cylinders, slings, booms and Cranes shall not exceed limits on tags or rating charts. Charts will be consulted prior to lifts to insure limits are observed.
2. All lifting and rigging shall be inspected prior to every use.
 - Wire ropes and web slings shall be inspected for condition, frays, bends and capacity. Defective slings shall be removed from service.
 - Connectors such as clevises, lifting eyes and rings shall be inspected prior to every use. Any damaged lifting connector must be removed from service.

M. ELECTRICAL SAFETY

Purpose

The Electrical Safety program is designed to prevent electrically related injuries and property damage. This program also provides for proper training of maintenance employees to ensure they have the requisite knowledge and understanding of electrical work practices and procedures. Only employees qualified in this program may conduct adjustment, repair or replacement of electrical components or equipment. Electricity has long been recognized as a serious workplace hazard, exposing employees to such dangers as electric shock, electrocution, fires and explosions.

Responsibilities

Management

- Provide training for qualified and unqualified employees
- Conduct inspections to identify electrical safety deficiencies
- Guard and correct all electrical deficiencies promptly
- Ensure all new electrical installations meet codes and regulations

Employees

- Report electrical deficiencies immediately
- Not work on electrical equipment unless authorized and trained
- Properly inspect all electrical equipment prior to use

Hazard Control

Engineering Controls

- All electrical distribution panels, breakers, disconnects, switches, junction boxes shall be completely enclosed
- Water tight enclosure shall be used where there is possibility of moisture entry either from operations or weather exposure.
- Electrical distribution areas will be guarded against accidental damage by locating in specifically designed rooms, use of substantial guard posts and rails and other structural means
- A clear approach and 3 foot (1 meter) side clearance shall be maintained for all distribution panels.
- All conduits shall be fully supported throughout its length. Non-electrical attachments to conduit are prohibited.
- All non-rigid cords shall be provided strain relief where necessary.

Administrative Controls

- Only trained and authorized employees may conduct repairs to electrical equipment.

- Contractors performing electrical work must be hold a license for the rated work
- Areas under new installation or repair will be sufficiently guarded with physical barriers and warning signs to prevent unauthorized entry
- Access to electrical distribution rooms is limited to those employees who have a need to enter
- All electrical control devices shall be properly labeled
- Work on energized circuits is prohibited unless specifically authorized by senior facility management
- All qualified employees will follow established electrical safety procedures and precautions

Protective Equipment

- Qualified employees will wear electrically rated safety shoes/boots.
- All tools used for electrical work shall be properly insulated
- Electrical rated gloves shall be available for work on electrical equipment
- Electrically rated matting will be installed in front of all distribution panels in electric utility rooms
- All conductive clothing or jewelry shall be covered with non-conductive material or removed prior to commencing work.

Electrical Equipment

Examination

Electrical equipment shall be free from recognized hazards that are likely to cause death or serious physical harm to employees. Safety of equipment shall be determined using the following considerations:

- Suitability for installation and use in conformity with the provisions of this subpart. Suitability of equipment for an identified purpose may be evidenced by listing or labeling for that identified purpose.

- Mechanical strength and durability, including, for parts designed to enclose and protect other equipment, the adequacy of the protection thus provided.
- Electrical insulation.
- Heating effects under conditions of use.
- Arcing effects.
- Classification by type, size, voltage, current capacity, and specific use.
- Other factors which contribute to the practical safeguarding of employees using or likely to come in contact with the equipment.

Identification of Disconnecting Means and Circuits

Each disconnecting means for motors and appliances shall be legibly marked to indicate its purpose. Each service, feeder, and branch circuit, at its disconnecting means or over-current device, shall be legibly marked to indicate its purpose. These markings shall be of sufficient durability to withstand the environment involved.

A disconnecting means is a switch that is used to disconnect the conductors of a circuit from the source of electric current. Disconnect switches are important because they enable a circuit to be opened, stopping the flow of electricity, and thus can effectively protect workers and equipment.

Each disconnect switch or over current device required for a service, feeder, or branch circuit must be clearly labeled to indicate the circuit's function and the label or marking should be located at the point where the circuit originates. For example, on a panel that controls several motors or on a motor control center, each disconnect must be clearly marked to indicate the motor to which each circuit is connected. In the figure below, the Number 2 circuit breaker in the panel box supplies current only to disconnect Number 2, which in turn controls the current to motor Number 2. This current to motor Number 2 can be shut off by the Number 2 circuit breaker or the Number 2 disconnect.

All labels and markings must be durable enough to withstand weather, chemicals, heat, corrosion, or any other environment to which they may be exposed.

Definition of Terms

Qualified Worker: An employee trained and authorized to conduct electrical work.

Unqualified: Employees who have not been trained or authorized by management to conduct electrical work.

Training

Training for Unqualified Employees

Training for Unqualified Employees in general electrical safety precautions to provide an awareness and understanding of electrical hazards.

Electrical Safety Rules for Non-Qualified Workers

1. Do not conduct any repairs to electrical equipment
2. Report all electrical deficiencies to your supervisor
3. Do not operate equipment if you suspect an electrical problem
4. Water and electricity do not mix.
5. Even low voltages can kill or injure you
6. Do not use cords or plugs if the ground prong is missing
7. Do not overload electrical receptacles

Training for Qualified Employees

Training for Qualified Employees includes specific equipment procedures and requirements of:

Personal Protective Equipment

Employees working in areas where the potential contacts with exposed electrical sources are present and likely, will be provided and shall use Personal Protective Equipment (PPE). The following rules apply to the use and care of PPEs:

1. PPEs shall be used where contact with exposed electrical sources are present and likely.
2. PPEs shall be designed for the work being performed and environment in which it is used.
3. PPEs shall be visually inspected and/or tested before use. Any defects or damage shall be replaced, repaired or discarded.
4. In cases where the insulating capabilities of the PPEs may be damaged during the work, a protective outer cover, such as leather, must be used.

5. Employees shall wear non-conductive head protection wherever there is a danger of injury from electrical burns or shock from contact with exposed energized parts.
6. Employee shall wear protective eye/face equipment whenever there is a danger from electrical arcs or flashes or from flying objects resulting from an electrical explosion.

Electrical PPE Inspection Schedule

Type of equipment	When to test
Rubber insulating line hose	Upon indication that insulating value is suspect.
Rubber insulating covers	Upon indication that insulating value is suspect.
Rubber insulating blankets	Before first issue and every 12 months
Rubber insulating gloves	Before first issue and every 6 months
Rubber insulating sleeves	Before first issue and every 12 months

Electrical Lock-out & Tag-out Requirements

Application of locks and tags.

1. A lock and a tag shall be placed on each disconnecting means used to de-energize circuits and equipment on which work is to be performed, except as provided for below.
2. The lock shall be attached so as to prevent persons from operating the disconnecting means unless they resort to undue force or the use of tools.
3. Each tag shall contain a statement prohibiting unauthorized operation of the disconnecting means and removal of the tag.
4. If a lock cannot be applied a tag may be used without a lock.
5. A tag used without a lock must be supplemented by at least one additional safety measure that provides a level of safety equivalent to that obtained by use of a lock. Examples of additional safety measures include the removal of an isolating circuit element, blocking of a controlling switch, or opening of an extra disconnecting device.
6. A lock may be placed without a tag only under the following conditions:
 - Only one circuit or piece of equipment is de-energized, and

- The lockout period does not extend beyond the work shift, and
- Employees exposed to the hazards associated with reenergizing the circuit or equipment are familiar with this procedure.

Working at Elevated Locations

Any person working on electrical equipment on a crane or other elevated must take necessary precautions to prevent a fall from reaction to electrical shock or other causes. A second person, knowledgeable as a safety watch, must assume the best possible position to assist the worker in case of an accident. Portable ladders shall have non-conductive side rails if they are used where the employee or the ladder could contact exposed energized parts.

General Protective Equipment and Tools

General Protective Equipment and Tools shall be used when in the proximity of, or working on, exposed energized parts. The following rules apply:

1. When working on or near exposed energized parts, Qualified Employees shall use insulated tools or handling equipment suitable for the voltage present and working environment. In cases where the insulation may be damaged, a protective outer layer should be employed.
2. Fuse handling equipment, insulated for the circuit voltage, shall be used to remove or install fuses when the terminal is energized.
3. Ropes and other handlines used near exposed energized equipment shall be non-conductive.

Warnings and Barricades

Warnings and barricades shall be employed to alert unqualified Employees of the present danger related to exposed energized parts. The following rules apply:

1. Safety signs, warning tags, etc., must be used to warn Unqualified Employees of the electrical hazards present, even temporarily, that may endanger them.

2. Non-conductive barricades shall be used with safety signs to prevent Unqualified Employees access to exposed energized parts or areas.
3. Where barricades and warning signs do not provide adequate protection from electrical hazards, an Attendant shall be stationed to warn and protect Employees.

Powered Equipment Safety Rules

Electrical equipment is defined as cord or plug-type electrical devices which include the use of flexible or extension cords. Examples of portable electrical equipment included powered hand tools, powered bench tools, fans, radios, etc. The following safety rules apply to portable electrical equipment (PEE):

1. PEE shall be handled in such a manner as to not cause damage. Power cords may not be stapled or otherwise hung in a way that may cause damage to the outer jacket or insulation.
2. PEE shall be visually inspected for damage, wear, cracked or spilt outer jackets or insulation, etc., before use or before each shift. PEE that remains connected once put in place need not be inspected until relocated. Any defects; such as cracked or split outer jackets or insulation must be repaired, replaced or placed out of service.
3. Always check the compatibility of cord sets and receptacles for proper use.
4. Ground type cord sets may only be used with ground type receptacles when used with equipment requiring a ground type conductor.
5. Attachment plugs and receptacle may not be altered or connected in a way that would prevent the proper continuity of the equipment grounding conductor. Adapters may not be used if they interrupt the continuity of the grounding conductor.
6. Only portable electrical equipment that is double insulated or designed for use in areas that are wet or likely to contact conductive liquids may be used.
7. Employees that are wet or have wet hands may not handle PEEs (plug-in, un-plug, etc.). Personal protective equipment must be used when handling PEEs that are wet or covered with a conductive liquid.

- Locking-type connectors shall be properly secured after connection to a power source.

Electrical Circuit Safety Procedures

1. Electrical power and lighting circuits are defined as devices specifically designed to connect, disconnect or reverse circuits under a power load condition. When these circuits are employed, the following rules apply:
2. Cable connectors (not of load-break type) fuses, terminal plugs or cable splice connectors may not be used, unless an emergency, to connect, disconnect or reverse in place of proper electrical circuits.
3. After a protective circuit is disconnected or opened, it may not be connected or closed until it has been determined that the equipment and circuit can be safely energized.
4. Over current protectors of circuits or connected circuits may not be modified, even on a temporary basis, beyond the installation safety requirements.
5. Only Qualified Employees may perform test on electrical circuits or equipment.
6. Test equipment and all associated test leads, cables, power cords, probes and connectors shall be visually inspected for external damage before use. Any damage or defects shall be repaired before use or placed out of service.
7. Test equipment shall be rated to meet or exceed the voltage being tested and fit for the environment in which it is being used.
8. Where flammable or ignitable materials are stored, even occasionally, electrical equipment capable of igniting them may not be used unless measures are taken to prevent hazardous conditions from developing.

Standard Operating Procedure

Electrical Pre-Work Procedure

Except in extreme cases, work on electrical equipment will be done with all electrical circuits in the work area de-energized by following the Lock-out/Tag-out procedure. When working on or near energized electrical circuits with less than 30 volts to ground, the equipment need not be de-energized if there will be no increased exposure to electrical burns or to explosion from electric arcs.

To prepare for work on electrical systems or components, the following procedure applies:

Caution: Treat all electrical circuits as "Live" until they have been Tagged and Locked Out and tested by the following procedure.

Obtain permission from supervisor to conduct work

Lock-out and Tag-out all sources of electrical power

Verify de-energized condition before any circuits or equipment are considered and worked as de-energized.

- A qualified person shall operate the equipment operating controls or otherwise verify that the equipment cannot be restarted.
- Verify proper operation of the Voltmeter at a live electrical source of the same rated voltage as the circuit to be worked.
- Using the Voltmeter, check all exposed circuits phase to phase and phase to ground for evidence of voltage/current in the circuit.
- Conduct work on the circuit only after determining that there is no voltage in any of the exposed circuits.
- If voltage is detected in any exposed circuit, STOP, inform supervisor and determine source and procedure to eliminate voltage.

Conduct work

Close up all exposed circuits, boxes, controls, equipment.

Remove Lock-out/Tag-out

Obtain supervisor permission to energize circuits

Standard Operating Procedure

Working on or Near Exposed Energized Circuits

In the rare situation when energized equipment (or working in near proximity to energized equipment) can not be de-energized, the following work practices must be used to provide protection:

Caution: Unqualified Employees are prohibited from working on or near exposed energized circuits.

1. Obtain permission from Manager to work on or near energized electrical circuits
2. Lock-out and Tag-out all circuits possible
3. Treat all circuits as energized.
4. Remove all conductive clothing and jewelry (rings, watches, wrist/neck chains, metal buttons, metal writing instruments, etc.).
5. Use proper personal protective equipment, shields and/or barriers to provide effective electrical insulation from energized circuits. This may include electrically rated insulated gloves, aprons, rubber-soled shoes, insulated shields, insulated tools, etc.
6. Provide adequate lighting. Do not enter areas with exposed energized parts unless illumination (lighting) is provided so that Employee may work safely. Do not reach around obstructions of view or lighting (blindly) into areas where exposed energized parts are located.
7. Employees entering a Confined Space with exposed energized parts, must use protective barriers, shields, or equipment or insulated materials rated at or above the present voltage to avoid contact.
8. Doors or other hinged panels shall be constructed and secured to prevent them from swinging into an Employee and causing contact with exposed energized parts.
9. Housekeeping in areas of exposed energized parts may not be completed in areas with close contact unless adequate safeguards

(insulation equipment or barriers) are present. Conductive cleaning material (Steel Wool, Silicon Carbide, etc.) or liquids may not be used unless procedures (Lock and Tag-Out, etc.) are in place and followed.

10. Station a safety observer outside work area. The sole function of this person is to quickly de-energize all sources of power or pull worker free from electrical work area with a non-conductive safety rope if contact is made with an energized electrical circuit.
11. A person qualified in CPR must be readily available to the scene.

Standard Operating Procedure Re-energizing Electrical Circuits After Work Completed

These requirements shall be met, in the order given, before circuits or equipment are reenergized, even temporarily.

1. A qualified person shall conduct tests and visual inspections, as necessary, to verify that all tools, electrical jumpers, shorts, grounds, and other such devices have been removed, so that the circuits and equipment can be safely energized.
2. Warn employees exposed to the hazards associated with reenergizing the circuit or equipment to stay clear of circuits and equipment.
3. Remove each lock and tag. They shall be removed by the employee who applied it or under his or her direct supervision. However, if this employee is absent from the workplace, then the lock or tag may be removed by a qualified supervisor designated to perform this task provided that:
 - The supervisor ensures that the employee who applied the lock or tag is not available at the workplace, and
 - The supervisor ensures that the employee is aware that the lock or tag has been removed before he or she resumes work at that workplace.
4. Conduct a visual determination that all employees are clear of the circuits and equipment.

Equipment Grounding Program

Purpose

To specify procedures and guidelines to eliminate all injuries resulting from possible malfunctions, improper grounding and/or defective electrical tools. This is accomplished through the establishment, implementation and management of an effective equipment grounding conductor program.

Scope

This program applies to all employees. Jacob & Samuel Drilling Ltd management will ensure that only equipment and materials appropriate to our applications shall be used.

Policy

Inspections:

All electrical cords, tools and lightning installations shall be inspected daily as part of the required daily inspection of the work area and prior to first use.

Any damaged or inoperative plugs, cords, lights or tools shall be tagged out of service and not used until repaired.

Quarterly, all electrical cords, extension cords, plugs and receptacles shall be inspected for condition, continuity and damage. A competent person shall perform this inspection on the first day of the quarter or as soon as practical thereafter.

Repaired items, or those that have suffered possible damage (such as pinched or run over by a vehicle) shall be rechecked prior to service.

Repairs:

Only a competent person shall perform electrical repairs.

All circuits shall be properly deenergized and tagged prior to initiating repairs.

In no case may an extension cord be spliced. Except that a damaged cord may be shortened and the grounded plug properly reinstalled.

All insulation, covers and panels shall be replaced prior to reenergizing and/or returning to service.

Installation:

All portable generators installed on drills shall be bonded to the drill frame.

All receptacles shall be grounded to the generator frame.

All portable generators and light plants shall use a grounding rod, installed as deeply as practical and preferably below the permanent moisture level.

N. COMPRESSED GAS CYLINDERS

I. PURPOSE

To establish the basic procedural requirements for the transportation and storage of compressed gas cylinders.

II. SCOPE

This procedure is applicable to all employees.

III. PROCEDURE

1. Cylinders will be stored in well-ventilated locations. Cylinders containing oxygen, acetylene, or other fuel gas shall not be taken into confined spaces.
2. Cylinders containing the same gas will be stores in a segregated group. Empty containers will be stores in the same manner.
3. Cylinders containing oxygen will be separated from cylinders in storage containing fuel by at least 20 feet (6 meters).
4. No smoking shall be allowed wherever cylinders are stored, handled, transported, or used.
5. Cylinders shall be protected from extremes of temperature, physical damage, and electrical current.

6. Cylinder valves shall be off when the cylinder is in storage, in transit, not in use, or empty.
7. Cylinder valve caps shall be in place when cylinders are in storage transit, and whenever the regulator is not in place.
8. All compressed gas cylinders in service shall be secured in substantial fixed portable racks or hand trucks. The cylinders shall be secured in an upright position, at all times by chains.
9. Cylinders will be handled in such a manner that handling will not weaken or damage the cylinder or valve.
10. Oxygen shall not be used as a substitute for compressed air.
~ Shower if available