



Construction Safety Manual

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1.0 DEFINITIONS

For the purpose of this Construction Safety Manual:

- 1.1 **"Accident Prevention"** means the application of measures designed to reduce accidents or accident potentials within a system, organization, or activity. An accident prevention program is one which aims to avoid injury to personnel and/or damage to property.
- 1.2 **"Competent person"** means a person who is qualified because of his or her knowledge, training and experience to perform the Work properly and safely.
- 1.3 **"Confined Space"** means a space with restricted access or egress, where because of its construction, location, contents or the Work activity therein, hazardous gas, vapour, dust or fumes may accumulate, or in which an oxygen-deficient atmosphere may occur.
- 1.4 **"Contractor"** means: a) prior to acceptance by Owner of a bid, any bidder, or, b) following acceptance by Owner of a bid, the bidder whose bid was accepted, including any partnership or Joint Venture formed for the purpose of contracting the Work.
- 1.5 **"Direct Supervision"** means the supervising worker or designate who is present at the job site and is fully aware and in control of the activities of the workers under their direct supervision.
- 1.6 **"Hot Work"** means the use of open flames, other heat sources and/or spark-producing devices where there is a potential for explosion or fire.
- 1.7 **"Incident"** means an undesirable event, which has the potential to cause injury or property damage.
- 1.8 **"Label"** means any sticker or tag affixed to a container to provide information on the contents of the container and the handling precautions which meet all Owner and legislative requirements.
- 1.9 **"Material Safety Data Sheet"** means a summary sheet supplied by the controlled product manufacturer that identifies the hazards, proper storage, and handling procedures and emergency treatment for the controlled product.
- 1.10 **"Regulation"** means a rule, ordinance, law, legal regulation or device by which conduct or performance is controlled.
- 1.11 **"Safe Work Permit"** shall mean a permit issued as a written record by which Owner authorizes a worker and/or work crew to do a specific job at that worksite. It identifies the safe work practices required for the type of work to be performed in the specified job location, during a specified time interval.
- 1.12 **"Safe Work Practices"** means the procedures for performing specific tasks which when followed protect persons from illness, injury, or property damage.
- 1.13 **"Supervisor"** means a supervisory person of the Contractor, at the site.

- 1.14 **"Visitor"** means any Owner or non-Owner, individual who is not performing any assigned work activity on an Owner controlled worksite (i.e. facility, field, or construction site). An example of a visitor is any individual or group on a tour of an Owner worksite.
- 1.15 **"Safety Officer"** means an individual who is qualified to provide on-site safety services as outlined in this manual.
- 1.16 **"WHMIS"** means Workplace Hazardous Material Information System.
- 1.17 **"Worker"** means any person engaged in an occupation at the worksite.
- 1.18 **"Zero Energy"** means the state of equipment when all sources of energy (i.e. electrical, mechanical, hydraulic, etc.) are isolated or effectively blocked and sources of stored energy are depleted.

2.0 PERFORMANCE STANDARD

- 2.1 No job is so important that it cannot be done safely. Unsafe conditions and/or work practices will not be accepted on Owner's Sites and must be resolved before work can proceed.
- 2.2 Although difficult to eliminate inherent risks in the workplace, these regulations and good judgement should enable everyone to do their job safely and efficiently. Owner requires that Work be performed safely and will not allow a Contractor or individual Worker who shows disregard for the health and safety requirements to continue working on Owner's Site.
- 2.3 Night shift work (includes security) shall only be allowed if the following requirements are met:
 - a) There is a minimum of two (2) workers, one of whom has a valid first aid certificate.
 - b) A suitable emergency conveyance vehicle must be provided for the workers.
 - c) Emergency communications is provided (2 way-radio or phone).
 - d) An emergency plan is submitted to Owner for approval.

3.0 CONTRACTOR'S SAFETY AND HEALTH PROGRAM

3.1 General

- 3.1.1 The Contractor's Health and Safety Program shall be included as part of the Contract Documents for the Work, and must be adhered to. The Contractor shall employ a full-time site safety officer(s) who will be responsible for ensuring compliance with the Contractor's Health and Safety Program, all legislated requirements and the requirements contained in the Owner's Safety Manual. In addition, the Contractor shall also include all provisions of the Contract Document relating to Health and Safety in all agreements with its Subcontractors.
- 3.1.2 These Health and Safety Regulations are a summary of the Rules and Regulations that Owner requires the Contractor to follow, as a minimum, in its program of Accident Prevention. These Regulations are not intended to be an all-inclusive set of rules, but are indicative of the minimum level of care and attention to safety that the Contractor and all personnel shall follow when working for Owner.
- 3.1.3 Work shall not proceed until all proper precautions have been taken to protect the Health and Safety of workers involved. Accidents and injuries are not necessary and can be prevented by following the appropriate Rules, Regulations and Safe Work Practices.
- 3.1.4 The Contractor's Health and Safety Program will consist of but not be limited to the following components:
- (a) Emergency Preparedness
 - (b) Training
 - (c) Inspections
 - (d) Control of Work Hazards
 - (e) Personal Protective Equipment
 - (f) Occupational Health Services
 - (g) Safety Meetings
 - (h) Accident/Incident Investigation

A detailed description of the Contractor's Safety Program shall be submitted as part of the Contract Documents at time of bid.

3.2 Regulations and Laws

- 3.2.1 Contractor shall abide by all latest editions of applicable federal and provincial government acts, regulations, laws and codes, including any required licensing of workers, inspections and certification of equipment. The Contractor will promptly report to Owner, and all applicable Authorities Having Jurisdiction, any accident or occurrence resulting in any actual or potential loss through execution of the Work.

References include but are not limited to:

- (a) Applicable Occupational Health and Safety Act as amended and associated regulations.
- (b) Provincial Public Health Act.
- (c) Provincial Workers' Compensation Act.
- (d) National Fire Protection Association, "National Fire Codes."
- (e) Provincial Fire Protection Act - Provincial Fire Code.
- (f) Environmental Regulations.
- (g) National Energy Board Act and Onshore Pipeline Regulations.
- (h) Crane and Hoisting Equipment Operator Trade Regulations.
- (i) Electrical Protection Act.
- (j) Boilers and Pressure Vessel Act.
- (k) Industrial and Construction Camp Regulations.
- (l) Transportation of Dangerous Goods Regulations.
- (m) WHMIS and Applicable Regulations.
- (n) Pipeline Contractor's Association.
- (o) Atomic Energy Commission.
- (p) Hazardous Products Act and Pursuant Regulations.

3.2.2 Workers' Compensation Board

Before a Contractor or any Subcontractor is permitted to work on any of Owner's sites, they must present proof of good standing with the Workers' Compensation Board of the province of Alberta. This good standing must be maintained for the duration of the Contract.

3.3 Contractor's Responsibilities

3.3.1 Responsibilities

The Contractor will provide Owner a Statement of Policy regarding safety. The statement will provide a philosophy and commitment that set levels of expectations for safety performance

The Contractor agrees to accept all responsibility for the health and safety of Workers, to meet the intent of the Owner's Safety, Health, and Environment policy. Contractor must provide Supervisors and Workers who are knowledgeable in the Health and Safety matters related to the Work and must explain the Health and Safety regulations and procedures to their employees at the Site and ensure compliance. The Contractor is further responsible for ensuring that property is not damaged and that their employees, other Workers, visitors and the general public are not subjected to injury or illness as a result of Contractor's operations.

The Contractor must ensure that all its Subcontractors adhere to the requirements specified herein.

An onsite Safety Officer shall be assigned exclusively to the Work to be solely responsible for coordinating the Contractor's safety program and advising Contractor management/supervision on matters related to Occupational Health and Safety. If the Contractor's Safety Officer temporarily leaves the site a second qualified person shall be designated. The Safety Officer shall not fulfill the role of an onsite First Aid Attendant.

The Contractor shall submit with the bid document a resume of the Safety Officer's experience and qualifications for approval by Owner. The Safety Officer shall possess a certificate or diploma in Occupational Health and Safety and preferably be a Registered Safety Professional. An equivalent combination of experience and education will be considered.

3.3.2 Unsafe Conditions or Practices

The Contractor shall immediately correct and report any unsafe conditions or practices observed. All related work shall cease until such conditions or practices are remedied or controlled as determined by Owner. All such reports will be made to Owner at the site as soon as practical.

Contractor will ensure that every employee is made aware that it is the employees right to refuse to perform work they believe is unsafe. Contractor will encourage employees to exercise this right if confronted by a situation or directive they believe could result in injury to themselves or others.

3.3.3 Visitors to the Site

With the exception of Owner's employees, the Contractor is required to provide all necessary control and guidance to Visitors to the Site to ensure their protection and, where necessary, provide appropriate personal protective equipment for their use.

3.3.4 Sanitary Facilities

The Contractor shall provide sufficient drinking fluids, and washroom and toilet facilities to meet all legislated requirements.

3.4 Training

3.4.1 Accident Prevention Indoctrination and Training

The Contractor shall ensure that their employees are suitably trained and competent in the safe work procedures and health and safety regulations pertaining to their duties. Where government certification is required, only properly licensed workers are to perform the work. All site personnel must attend a safety orientation conducted by the Contractor, which covers the specific health and safety programs and the requirements of the project site. The Contractor's safety orientation shall be presented to Owner for approval prior to the commencement of the project. Each employee must attend one of these orientations before commencing work on the project. Further training and instruction shall be provided on an ongoing basis as

necessary to support competency on the Site, and before the start of any new major segment of the Work. The Contractor is required to retain a written record of attendees and topics for all such meetings.

3.4.2 Safety Orientation

Contractor's and Subcontractor's personnel must be instructed about Owner's safety policies and the Contractor's safety program and objectives. The Contractor is responsible to ensure that each new or transferred employee is oriented to the project prior to commencing work. The subjects covered in a safety orientation shall include, but not be limited to, the following:

- (a) Owner's pipeline colour coding system
- (b) "Safety Orientation Video" (Owner may also provide a short video);
- (c) foreign crossing excavation and installation
- (d) approved Construction Safety Manual
- (e) Owner's Environmental Health and Safety Expectations (handbook) (See Exhibit C);
- (f) Site specific permitting procedures.
- (g) site specific emergency procedures and evacuation plans;
- (h) safety responsibilities of Contractor personnel;
- (i) potential hazards;
- (j) general safety rules;
- (k) safe work practices;
- (l) personal protective equipment requirements;
- (m) special safety requirements;
- (n) equipment operation;
- (o) accident prevention;
- (p) accident/incident reporting procedures;
- (q) the worker's right to refuse to do unsafe work;
- (r) the worker's immediate supervisor and supervisor in charge of project;
- (s) name of medical aid attendants and availability of medical aid services

The Contractor shall provide all levels of supervision with the necessary training to enable them to administer the health and safety program. Records of all training and certification will be maintained by the Contractor.

3.4.3 Safety Meetings

In the addition to the safety orientation, the Contractor shall hold weekly safety meetings with each and every crew on the Site to review significant incidents and communicate special hazards, as well as to maintain the Workers' safety awareness and knowledge at the level necessary to support safe work habits. The Contractor's Superintendent or appointee and Safety Officer shall conduct the meetings. They shall maintain a record of agendas and a list of attendees. Contractor shall provide Owner 24 hours notice of the time and place of their meetings to allow Owner's Representative to attend. A copy must be provided to Owner within 48 hours of meeting occurring.

Contractor's Safety Officer shall establish a safety committee and hold regular meetings to review health and safety issues.

Contractor shall provide Owner with 24 hours notice of the time and place of these committee meetings to allow Owner's Representative to attend.

In addition, each Supervisor is to hold a daily tailgate meeting to remind workers of the job-specific hazards, and more frequently as necessary in order to address specific hazards, or if so requested by Owner. The agendas of these tailgate meetings are to be maintained by Contractor and submitted to Owner.

Subcontractors are the responsibility of the Contractor. The Contractor shall ensure all Subcontractors are made aware of and meet all Owner safety requirements. Contractor shall be prepared to submit any or all Subcontractor safety programs upon request.

3.5 Audits and Inspections

3.5.1 Informal Inspections

The Contractor's supervisors are to conduct informal safety inspections as part of their daily activities at each location. Hazard identification activities are important and should provide employees with a means of reporting substandard conditions or practices.

3.5.2 Safety Audits and Inspections

At all times, it is the Contractor's responsibility to keep work areas free of hazards, which could affect workers' health and safety. In addition to the ongoing informal inspections of the Site by supervisory personnel, the Contractor's Safety Officer shall perform a formal documented inspection of the Site, as a minimum once every (10) ten days, to identify and correct any hazardous conditions or unsafe acts noted.

All Owner Sites are subject to inspection and audit by Owner's Safety Officer. Each audit will be based on the requirements of maintaining a safety and health program as outlined in this safety manual.

The Contractor shall cooperate fully with all Governmental Occupational Health and Safety inspections and provide a copy of such inspection reports to the Owner.

3.5.3 Documentation

A written record of all inspections, their results and corrective action taken shall be given to Owner within 72 hours of an inspection.

3.6 Control of Work Hazards

3.6.1 Instructions Before Starting Work

Before starting work on any site, Owner and Contractor shall conduct a pre-job safety meeting to discuss specific instructions concerning known site or work hazards and any special procedures/practices specific to that site.

The Contractor is required to discuss the hazards and the Safe Work Practices with all on-site personnel through an orientation Tailgate Meeting prior to the start of any work. All identified hazards shall be suitably posted to warn personnel in the area.

3.6.2 Hazard Identification Signs

In addition to all legislated requirements for signs and to ensure that hazards are clearly identified, specific signs must be installed and maintained.

- (a) **Pipeline Construction Signs** Pipeline construction signs are to be posted at all entries to the right-of-way facing the intersecting road where construction activities are being conducted. Signs must be equipped with a telephone number for unauthorized personnel to contact. These signs shall be 1.2m x 1.2m in size.
- (b) **Pipeline Crossing Signs - Highways** All crossings of primary and secondary highways shall be posted with signs which are designed and located in accordance with the requirements of the Provincial Highways Traffic Act. Such signs shall be clearly visible from both directions when approaching the crossing location.
- (c) **Pipeline Crossing Signs - Roads** All road crossings will have 1.2m x 1.2m signs erected one hundred metres (100m) from both directions approaching the crossing. Alternatively, the Contractor may use, at his option, the same signs as for primary and secondary highways. Signs will be elevated and kept clearly visible on the right hand side of the road.
- (d) **High Pressure Testing Signs** High pressure testing signs shall be posted to warn personnel to stay clear from testing areas. More than one sign at each location may be required as deemed necessary by Owner. Signs shall be 1.2m x 1.2m in size.
- (e) **Overhead Powerline Signs** Overhead powerline signs must be posted (see the Overhead Powerline section in this manual).

3.6.3 Safe Work Permits

Introduction

The Safe Work Permit form must be completed and signed prior to the start of specific work activities as described in this section.

The Safe Work Permit form serves as an important communication device between those authorized to issue the permit, and the Contractor's personnel performing the Work. This communication is important to ensure that all required safety measures are implemented before and during execution of the Work.

Permit Requirements

Owner shall be contacted to issue a Safe Work Permit before the start of any Work on Owner's site that involves the following:

- (a) use of explosive devices.
- (b) confined space entry.
- (c) any Work within the boundaries of Owner's facilities.
- (d) Grading or excavation within two metres of hot lines or any underground facilities.

The Contractor is responsible for ensuring that the Conditions and all other requirements of the Safe Work Permit are reviewed with all personnel involved, and adhered to during the Work.

The Contractor's site supervisor shall retain a copy of the Safe Work Permit at the site and return same at the end of each day.

A Safe Work Permit shall only be valid for the day and purpose it was issued, however, all Work must cease by the proposed completion time unless a new permit is issued or the existing permit is extended by Owner.

The Owner has the authority to stop the Work being performed by the Contractor if safety standards are not maintained.

3.6.4 Head and Facial Hair Policy

Contractor personnel who are/may be required to wear respiratory protective equipment must be clean shaven on all areas of the face where a seal is required for proper use of respiratory protection.

Where there is a danger of contact with moving machine parts or a source of ignition, hair on the head and/or facial hair shall be confined or worn at a length which will eliminate the danger of snagging or catching in moving parts, or catching on fire from a spark or other ignition source.

3.6.5 Loose Clothing Policy

Loose clothing, long hair, dangling accessories, jewelry, or other similar items shall not be worn unless they are adequately tied, covered, or otherwise secured.

3.6.6 Controlled Products Handling and Use

The key elements in handling hazardous materials are recognition, evaluation and control. The WHMIS (Workplace Hazardous Material Information System) has been developed to inform you about the hazards of materials you work with so that you can protect yourself and respond to emergency situations.

WHMIS is a hazard communication system whereby information is provided to workers in three ways:

1. Supplier and Workplace Labels: labelling of controlled products;
2. MSDS: provision of Material Safety Data Sheets for controlled products; and
3. Training: in the use and handling of controlled products

It is the responsibility of the Contractor to comply with WHMIS legislation.

Contractors working on Owner's Site must meet or exceed Owner's hazardous material information standards. The contractor must:

1. Maintain an up-to-date inventory list of all controlled products they bring on site
2. WHMIS supplier or workplace labels shall be applied to all controlled product containers.
3. Retain Material Safety Data Sheets (MSDS) for all controlled products they bring on site.
4. Provide suitable training for all workers required to work with, or in the vicinity of all jobs involving controlled products including:
 - (i) Proper use of workplace labels
 - (ii) Use of Material Safety Data Sheets
 - (iii) Specific training in the handling, use of and disposal of controlled products and Personal Protective Equipment requirements
5. Provide suitable training, to meet the Transportation of Dangerous Goods legislated requirements, for those workers involved in transporting dangerous goods

Records of this training shall be maintained by the Contractor for review by Owner to:

- (a) Ensure their employees and Subcontractors meet or exceed the Work practice requirements provided on the MSDS's and Labels.
- (b) Inform Owner of the hazards associated with the controlled product being used prior to commencing work.
- (c) Receive Owner's approval for any additional controlled products required during the term of the Contract.

Contractors are also required to have:

- (a) Procedures and equipment for storage and use of all controlled products needed for the Work.
- (b) Written procedures and all necessary equipment for proper storage and disposal of all hazardous waste.
- (c) Written emergency procedures to handle all types of emergencies with the controlled products on Site.

3.7 Accidents and Incidents

3.7.1 Treatment of Injured

The Contractor shall provide qualified personnel and equipment for first aid treatment and the transportation of ill or injured employees in accordance with legislated Occupational Health and Safety requirements.

3.7.2 Accident/Incident Investigation and Reporting

Definition: All accident/incidents within the “Total Construction” work will be reported and investigated by the Contractor. This includes any property damage or personal injury during the transportation of equipment or personnel to and from the Site.

The Owner shall be notified by the Contractor immediately of all accidents/incidents.

The Contractor shall provide a detailed written report within 24 hours of the occurrence.

The format and content of the detailed report form shall be submitted to the Owner for approval prior to commencement of the WORK.

Additionally, the Contractor is required to report the accident/incident to the applicable provincial occupation health and safety authorities.

The following types of accidents/incidents are to be reported to the Owner and thoroughly investigated:

- (a) Near miss or close call incident.
- (b) Medical Aid injuries.
- (c) Lost Time injuries.
- (d) Fatalities.
- (e) Vehicle accidents.
- (f) Any property damage.
- (g) Fires or explosion.
- (h) Lifting device failures.
- (i) Any controlled product spills.
- (j) Inadvertent contact with Owner’s facilities or the facilities of others.

The Contractor will regularly update Owner on the status of follow-up actions. The Contractor shall submit a Monthly Safety Report within seven (7) working days of the end of each month and at project completion. The report shall include the number of first aid, medical aid, lost time injuries and hours worked for the reporting period.

In addition the Contractor shall cooperate and provide all requested information to assist Owner’s internal investigation of any accident or incident.

3.8 Emergency Preparedness

3.8.1 Emergency Plans

The Contractor shall prepare a detailed written emergency plan for potential major accidental injuries for the Work prior to job commencement.

Site specific plans shall be reviewed at tailgate meetings and be made readily available at each worksite. These plans will include but not be limited to:

- (a) safe shutdown of all work activities.
- (b) Site evacuation
- (c) instructions for notification of authorities and the Contractor's designated personnel for after hours contact (including telephone numbers and locations).
- (d) telephone numbers and locations for police, fire, ambulance, hospital and Owner personnel.
- (e) notifying hospital to prepare for special needs (e.g. stock up on venom antidote).

3.8.2 Special Equipment

The Contractor must have all special equipment required to support the emergency plans on the Site available for immediate use and must inspect it regularly. This equipment may include items such as air horns, wind socks, gas detectors, etc.

3.8.3 Evacuations

The Contractor must have trained personnel available to evacuate injured or ill workers. The Contractor is to provide or make advance arrangements with ambulances, hospitals, and physicians to respond to emergencies. Emergency numbers are to be posted by all telephones and carried in all Contractor Vehicles on Site. All personnel are to be trained in the proper techniques and routes for Site excavations in an emergency. They should be familiar with designated gathering points and how to conduct head counts to account for all personnel.

3.8.4 Fire Fighting

The Contractor is required to have adequate fire-fighting equipment to deal with expected fire hazards, which might occur during the Work. There must be a sufficient number of competent Contractor personnel to use the equipment. All fire extinguishers on site must be visually inspected monthly by a Competent person, to ensure they are operational. In addition, each extinguisher will have an inspection tag initialed by that service person.

A minimum of one 10 pound ABC rated, portable dry chemical fire extinguishers shall be provided for each of all powered mobile equipment. One 30 pound ABC rated, portable dry chemical fire extinguisher shall be provided for each of all welding trucks and service vehicles.

3.9 Workers' Responsibilities

Workers shall report to work in a fit and proper condition to perform their jobs in a safe, competent manner. No Worker shall enter the Site while under the influence of alcohol or other substance, or use such items on the worksite. Violation shall be cause for permanent removal from the worksite.

- 3.9.2 Workers must read, understand, observe, and follow all established safety rules and work practices. They must adhere to all written/verbal work directives and procedures for the tasks assigned.
- 3.9.3 Use the minimum personnel protective equipment requirements as outlined in this manual.
- 3.9.4 Notify his/her supervisor of any unsafe conditions or acts that may be of danger to other workers or himself/herself.
- 3.9.5 To report all accidents and injuries to his/her supervisor immediately.
- 3.9.6 To take every reasonable precaution to protect the safety of others and themselves.
- 3.9.7 Employees must attend all scheduled safety meetings
- 3.9.8 It is the right of all employees to refuse to perform work they believe unsafe.
- 3.9.9 Workers must be prepared mentally and physically to do the job.

4.0 SAFE WORK PRACTICES

4.1 General

The following safe work practices and procedures, while specific in nature, are not to be considered a complete safety program, but are to be indicative of the minimum level of safety standards in the Work to be performed.

4.2 Facilities

Field Offices and Storage Areas

Field offices, storage areas, and other temporary facilities to be used by the Contractor during the course of the Work shall be maintained and operated in accordance with all applicable Owner and legislated regulations. The following conditions shall apply:

- 4.2.1 Solid combustible garbage will be collected and secured daily, until incineration or disposal, to prevent the attraction of wildlife.
- 4.2.2 All on-site nonmobile fuel storage tanks larger than 1000 litres (300 gallons) will be enclosed in an impermeable berm with a holding capacity equal to 125% of the largest tank within the berm.

4.3 Equipment

4.3.1 Equipment Use on Owner's Property

The use and movement of heavy equipment or loads on Owner's facility sites shall be done only under carefully controlled conditions and in accordance with Owner's Safety Standards contained herein.

4.3.2 Equipment Standards

Contractor shall ensure that all equipment or tools used in the performance of the Work.

- (a) Meet all legislated Health and Safety standards.
- (b) Are maintained in a condition that will not compromise the Health and Safety of Workers using or transporting the equipment.
- (c) Will perform the function(s) for which they were intended or were designed.
- (d) Are of adequate strength for their purpose.
- (e) Are free from defect.

Equipment and tools which, in Owner's opinion, fail to meet any of the above requirements shall be removed from the Site and replaced with equipment and tools satisfactory to Owner, all at the Contractor's expense.

Equipment must be installed and operated in accordance with the manufacturer's instructions, with special attention to provisions regarding fire protection, electrical grounding and other safeguards. No equipment shall be operated without all safety guards and devices in place and functioning properly.

All Contractor's equipment must be maintained in a safe operating condition.

All diesel powered equipment excavating and/or grading within 3 metres of a buried utility must have positive air shut-offs installed. In addition all diesel powered equipment, excavating and or grading within 3 metres of a buried utility, must have spark arrestors with the exception being those diesel engines that are turbo charged.

Excavating equipment trenching within 2.0 metres of a buried utility shall be equipped with a bucket with no digging teeth.

All propane bottles will be certified, be equipped with regulators and not be used or stored in an enclosed area and hand-held tiger torches are not to be left unattended while in operation.

4.3.3 Powered Mobile Equipment Operation

Only competent, authorized personnel are to operate powered mobile equipment. Operators shall inspect their equipment immediately prior to use and shall include a check of all lifting device components. Cables should be checked in its start position and by running out sufficient amounts to check any sections previously not visible (hidden in the sheaves). Written records will be kept of the inspection results (i.e. log books). Daily log books shall be maintained by operators of equipment intended to be used as a lifting device. Log books must be readily available for inspection on all lifting or hoisting equipment. This equipment would include, but not be limited to cranes, sidebooms, backhoes, etc.

Enclosures or other additions must not block the operator's view and are to be fitted in such a way as to prevent a person, other than the operator, from entering between the enclosure and the equipment. Where powered mobile equipment is provided with rollover protection, seatbelts must be provided and used. On all other equipment, where seatbelts have been provided, they shall be worn.

The movement of mobile equipment operating in the vicinity of workers and powerlines must be limited according to the procedures contained in this manual which require the use of designated signallers where necessary. Equipment shall travel no faster than a walking pace (6 km/hr) when in this vicinity.

4.3.4 Motor Vehicles

All Contractor motor vehicles used on the Site shall be in safe operating condition. Only licensed competent personnel are to operate vehicles. Vehicles must be parked away from the Work but within the defined Work boundaries. The speed limit on all pipeline right-of-ways should be determined by existing conditions. The maximum speed limit will be 30 kph and the maximum speed while passing workers will be 20 kph. During pre-project planning, the Owner will determine if any exception to the speed limits is acceptable and will confirm in writing any revisions to the Contractor. While driving on the Right-of-Way, headlights must be on at all times. Workers are to ride only within the passenger compartments of vehicles. All mobile welding rigs must be equipped with a fire extinguisher (30# ABC Type dry chemical) and welders and helpers must be competent in their use.

Vehicles with restricted vision are not to be moved in the vicinity of workers except under the direction of a designated signaler. Back-up alarms will be installed and used according to applicable legislated standards, but as a minimum shall be installed on all powered mobile equipment which includes vehicles in excess of one-ton G.V.W.

Pipe shall be strung, stockpiled, and transported in accordance with the procedures outlined in the Contract Document.

4.3.5 All-Terrain Vehicles (ATV's)

Only Competent experienced persons shall operate an ATV on Owner's Site. Every operator of an ATV will wear appropriate personal protective equipment including a CSA-approved helmet. Only one person will ride on the ATV. ATV's shall be operated in accordance with manufacturer's specification. ATV's will be equipped with a whip aerial with a flag, and first aid kit.

4.3.6 Refueling

Equipment and vehicles are to be refuelled away from any source of ignition. During refuelling, engines are to be turned off, and safe practices are to be observed to prevent fires, explosions or spills. Fuel shall be stored in, dispensed from or into approved containers. Adequate fire protection must be provided.

4.3.7 Lifting Devices

The Contractor shall ensure lifting devices are operated by Competent personnel (licensed as required) and that a signal person is designated and utilized as required. The signaller is to be visible by wearing a fluorescent vest.

Prior to performing any lift, the operator shall determine the weight of the object being lifted and ensure that the cables, lifting device and any slings, wire ropes, chains, etc. used in the lift are of a sufficient strength to support the weight of the load. All supports, outriggers, and pads will be inspected to ensure that ground support is adequate and will not settle under anticipated loads.

No Worker shall allow any part of their body to extend under any load being handled by a crane or other lifting device. Tag lines must be used to guide and control the load.

All hoisting devices must meet the applicable standards for design and construction.

A maintenance program shall be implemented prior to using any lifting or hoisting device to ensure that components are in good condition (i.e. brakes, boom cables, sheaves, etc.). The operator shall perform equipment checks prior to use to verify the equipment is in good condition. Written records of all inspection results for each crane, hoist, sideboom, backhoe, etc., intended to be used for lifting materials shall be available for review by Owner. Operators of lifting devices shall maintain a daily log of inspections.

4.3.8 Electrical Safety

- (a) Only qualified electrical personnel will perform electrical repair, maintenance, and construction work as per the applicable provincial regulations or as otherwise specified within the contract documents.
- (b) Other Contractor persons assigned to work where potential electrical hazards exist must be informed of the hazards associated with the Work, and instructed in the safety precautions and safe work procedures to be followed.
- (c) Contractors shall ensure no one is permitted to perform electrical work around electrical lines or equipment without proper qualification.
- (d) While working on or about electrical lines or equipment, personnel will keep sleeves down and buttoned and avoid wearing loose clothing and unnecessary metal articles such as rings, watches, necklaces, and key chains.
- (e) Metal measuring tapes, ladders, conductive tools or ropes having conductive threads woven into the fabric must not be used near live electrical works.
- (f) When it is necessary to perform work in proximity to power lines, Contractor personnel, tools, materials and equipment are not permitted to approach the conductors or lines closer than the safe limits of approach distances specified in this manual.

4.3.9 Overhead Powerlines

Prior to initiating any Work the Contractor shall identify and erect signs at overhead powerline locations in accordance with the following:

- (a) Identification
Review project drawings, noting overhead powerlines and confirm their location and contact the utility owner to determine operating voltage. This shall be done by the Contractor Superintendent or designate.
- (b) Markings
Overhead powerlines shall be identified with signs (See Drawings) placed approximately seven (7) m (23 ft) on either side of the overhead powerline, 1.8 m (6 ft) above grade and in view of equipment travelling either direction under the powerline.
Signs shall be installed before the Work commences, and be maintained throughout construction.
- (c) Protection
A guard consisting of a pole on each side of the Right-of-Way connected by a nonconductive rope shall be installed six (6) metres away from and on each side of the Overhead Powerline as shown in the Drawings.
- (d) Safe Limits of Approach

No lifting device or other equipment being operated around overhead powerlines shall be closer than the safe limits listed below.

When crossing under any overhead powerline a designated signaller will be used.

Minimum Safe Limits of Approach Distances				
Voltage Range Line to Ground				Equipment Clearance Distance in Meters
Over	425	to	50,000	3
Over	50,000	to	120,000	4.5
Over	120,000	to	250,000	6
Over	250,000	to	350,000	7.5
Over	350,000	to	400,000	9
Ref: Canada Labour Code, Canada OH & S Regulations				

The above clearances apply in all directions, vertical or horizontal.

If any activity is being carried out near the safe limit of approach distances, Contractor will assign a signal person to ensure the minimum distances are maintained.

Where safe limit of approach distances cannot be maintained, power outages may be required.

4.3.10 Controlling Induced Voltage

If the pipeline parallels the power company right-of-way, it will be within the electric field, which surrounds the overhead cables, and, as a result, an induced AC voltage may be generated on the pipeline. The magnitude of this voltage depends on the amount of current carried by the transmission lines, the geometric configuration of the pipeline with respect to the transmission cables, and the length of pipeline paralleling the transmission line. Pipelines, even after leaving the power lines, carry a pipe-to-ground potential.

Generally the voltage on the above ground appurtenances such as valves and scraper traps is limited to 15 volts which is accepted in industry to be a safe level. The voltage on the buried portions of the pipe line however, may exceed this level and grounding of the pipeline will be employed to protect against electric shock. These requirements are limited not only to pipelines paralleling high voltage transmission lines, but on pipelines extending beyond transmission lines and remaining under their influence for up to 15 kilometres from the point of departure.

Procedure

- (a) Grounding personnel who handle the pipe, valves, casing or measuring equipment will wear insulated gloves. These gloves will be 28 cm (11 in.) low

voltage linemen's rubber gloves and be protected by leather gauntlet gloves on top.

- (b) Work on the pipeline will not commence until the induced voltage on the pipeline has been measured. This measurement is to be taken daily and prior to re-commencement of any Work stoppage (use a high input impedance AC volt meter connected between the pipe and a ground rod pushed into the soil at least 10 cm).

If the voltage exceeds 15 volts then the pipe will be grounded by connecting a ground cable from the pipe to a ground rod pushed into the soil at least 10 cm.

- (c) Any piping being welded up on skids along the right-of-way will be grounded at necessary intervals to reduce the voltage in the pipe to 15 volts and its grounds are to be maintained until it is welded into the system.
- (d) If the voltage measured from the pipe to ground exceeds 15 volts with the above grounding system installed then the Contractor shall contact the Owner for direction.
- (e) Work shall be stopped if an electrical storm is passing through the area and the Owner or the Contractor's supervisor determines it poses an additional hazard.

4.3.11 Ropes, Chains, Slings and Cables

A competent person shall inspect wire ropes, chains or slings prior to use. If the equipment is worn, frayed, kinked, twisted or showing signs of damage or excessive wear, it shall not be used. Defective equipment must be returned for repair or disposal.

The Supervisor must be notified and shall take proper steps to ensure that the defective item is not used.

Ropes and cables shall be protected from sharp edges, etc., during any lift and shall be properly stored when not in use. Approval from the Owner is required for any use of chain as a hoisting device.

The Contractor's supervisors shall ensure that manufacturer's information for all slings being used have been reviewed to determine the limitations of the slings prior to their use.

4.3.12 Scaffolds

Scaffolds must be constructed in accordance with the applicable legislated requirements and they must be erected by a competent person. Vertical supports must be plumb and rest on a firm surface or sill. Working surfaces must be horizontal, secured against movement, with a maximum of 5 cm (2 inches) gap between planks, and a maximum span of 3 metres (10 feet). The maximum height allowed is three times the minimum base width of the scaffold unless auxiliary supports are used. Guardrails are required for all working surfaces above 3 metres (10 feet). Rolling scaffold must be used on a smooth, level surface and must not be ridden when moved. The built-in scaffold ladder is the only accepted means of

access and egress. Scaffolds in place for more than one week must be reinspected weekly by a Competent safety person.

4.3.13 Ladders

Ladders shall be provided and used in accordance with legislated requirements. Ladders in use should be equipped with the proper safety feet to suit the job. "Job built" ladders shall meet legislated requirements.

When using a portable ladder:

- (a) The base of the ladder must be no further from the wall or structure than one quarter of the length of the ladder measured from the point at which the ladder contacts the wall or structure.
- (b) The side rails of the ladder must extend at least one metre above any platform, etc. that is being accessed by the ladder.
- (c) The ladder must be secured against movement.
- (d) Workers shall not step on or work from the top two rungs of the ladder.
- (e) Personnel working from a ladder more than 3 metres above grade shall wear approved fall protection.

4.3.14 Guardrails, Platforms and Barricades

The Contractor is to provide and maintain all signs, barriers, flag persons, etc. necessary to protect workers and the general public from injury. Barricades at public areas (i.e. road crossings) are to have flashing lights during hours of darkness. Fencing must be installed where the Work is accessible to the general public.

All work areas, walkways, platforms, etc., elevated 3 m (10 ft) or more, whether permanent or temporary are to be enclosed by an approved guardrail (with an upper and intermediate rail and toe board) and are to provide safe working surfaces. All floor openings or excavations must have a securely installed temporary covering or a proper guardrail to limit access of individuals not directly related to the opening or excavation work. Ribbons or rope do not constitute an acceptable guardrail or barricade.

4.3.15 Portable Heaters

Portable heaters may only be installed, ignited or serviced by a competent and experienced person, in accordance with the manufacturer's instructions. All heaters must be approved for the service for which they are being used and must have adequate ventilation to prevent a buildup of fumes. All combustible material must be removed from the immediate area of the heater. Repairs and maintenance (beyond refueling, cleaning, etc. necessary for everyday service) shall only be done by licensed personnel.

All heaters on Owner's site must be monitored by a competent worker at all times.

4.4 Work Procedures

4.4.1 Compressed Air

Compressed air shall not be used for cleaning workers or their clothing. Air hoses are to be properly secured to prevent accidental disconnection. Proper safety nozzles and personal protective equipment must be used and the area isolated for blowing off equipment or floors. Workers must be made aware of the hazards associated with compressed air.

4.4.2 Compressed Gas Cylinders

All compressed gas cylinders must be returned promptly to a suitable storage area after use. Storage areas must be located away from general traffic and vehicle paths. Cylinders shall not be stored in confined, non-ventilated areas or cabinets.

Cylinder storage areas are to be divided into areas marked as “full” and “empty.” Appropriate measures must be taken to separate cylinders containing substances which, if mixed, could produce an explosive hazard.

When not in use, cylinder valves are to be closed, and connecting hoses are to be depressurized. Cylinders must have valve protection caps in place whenever they are not connected for use or while being transported.

Whether empty or full, all cylinders are to be stored, transported and used as per manufacturer’s specifications. They are to be secured to some substantial stationary object or structure by a chain or by another suitable means capable of supporting the weight of the cylinder. Cylinders may only be hoisted when enclosed in an appropriate box or cradle within which they are securely fastened.

Flashback arrestors are to be installed at the regulator end of all lines.

4.4.3 Excavation, Trenching, Piling

General

All excavation and trenching work practices must conform to the applicable Owner procedures and government Regulations. Excavations greater than 1.5 metres in depth in Alberta and 1.2 metres in British Columbia, must be properly sloped (or shored) and have access ladders, ramps or steps prior to entry by personnel.

All equipment shall maintain a clearance of at least 1 metre (3 feet) from the edge of any trench or excavation.

Before commencement of any excavations, trenching, or piling on or within Owner’s facility sites, the Contractor shall request a Safe Work Permit from Manager, as outlined in the Safe Work Permit section of this manual. The Contractor Supervisor must be in possession of a valid permit at the Work Site.

Contractor shall ensure that all employees are familiar with and wear fall protection in the vicinity of open trenches in accordance with the conditions outlined in Section 4.4.9.

4.4.4 Locating Underground Facilities

Contractor will be responsible for notifying and coordinating with the owner of the foreign utility being crossed, the process of locating and exposing the utility. Contact information and specific requirements pertaining to individual foreign crossings are detailed in the Contract Documents.

Buried utilities must be exposed by an experienced person 1.5 kilometres in advance of any stripping, grading, or excavating work. Mechanical excavations are to be done in accordance with the Crossing agreements, but in NO cases will any excavation be allowed any closer than 1.0 m from the buried utility, unless approved by Manager.

Methods of exposing buried components may include hand excavation or the use of a hydro-vac system.

The Contractor shall ensure adequate signs and barriers are in place to limit access to all excavations which may be a hazard to the general public, livestock, or wildlife.

4.4.5 Pigging and Hydrostatic Testing

Pigging and testing of pipelines and facilities will be carried out in accordance with the procedures and applicable regulations made under government legislation. Where necessary, permits will be obtained by the Owner or the Contractor as specified in the Contract Document. Copies of all permits will be in the possession of the Contractor Site Supervisor as well as the Inspector.

Only personnel directly involved in pigging or testing will be allowed in the immediate vicinity of pig catchers, test heads, pressure pumps, or exposed sections of pipe or facilities during testing. Persons not directly involved in the testing will be kept back a minimum of 100 m from the pipeline by the use of signs, fencing, and verbal warnings.

The Contractor will provide a safe means of access and egress for trenches and proper, safe scaffolding at the test heads, adequate lighting when night work is necessary, and a fire extinguisher at both ends of a pigging or test section.

Signs are to be in place prior to testing as described in 3.6.2d). Prior to any attempt to remove a test head or open a pig sender or catcher, the line shall be checked by the Contractor's Supervisor or other competent person to ensure the line is in a zero pressure condition.

Pressure will be released from both ends of the pig or test section prior to loosening or removing any fittings.

Contractor will ensure that no unauthorized workers are at the ends of the pipe or in the immediate vicinity of the pig-catcher when the pipe or pig-catcher is under pressure during pigging or testing.

All hoses, fittings, valves, etc., will be of adequate design for the pressures used and maintained in good condition.

Precautions must be taken to protect employees and the public from injury caused by any dirt or debris blown out of the open end of the pipe.

4.4.6 Confined Spaces

An enclosed or partially enclosed space that:

- (a) is not designed or intended for human occupancy except for the purpose of performing work;
- (b) has restricted means of access and egress; or
- (c) may become hazardous to an individual entering it due to one or more of the following characteristics:
 - 1. the materials or substances in it;
 - 2. a hazardous atmosphere;
 - 3. contains a liquid in which an individual may drown;
 - 4. the work activity creates a hazardous condition (e.g.: welding, fibre-glassing, sandblasting); and/or
 - 5. the design and construction (e.g.: internal configuration) or location is such that a person could become trapped.

The Contractor shall comply with all provincial Occupational Safety and Health Regulations for Confined Space Entry and the Contractor shall submit their written procedures to the Owner for approval prior to commencement of the Work.

Entry by a worker into Confined Space shall be under the control of a Safe Work Permit for Confined Space Entry and shall meet Owner and legislated requirements for testing, ventilation, recording of test data and personal protective equipment.

The Contractor's Safety Officer is responsible for monitoring necessary testing and protective measures. Where there is potential for exposure to a toxic or oxygen deficient atmosphere, approved respiratory protection will be worn.

Hazardous gases or oxygen deficiency cannot always be detected by sight or smell, and areas, which may contain a harmful atmosphere, must be tested. All areas found to be hazardous must be ventilated and checked with gas detection equipment to ensure it is safe before work is started or resumed.

4.4.7 Isolation of Equipment and Facilities

Any hazardous substance contained within equipment and facilities must be controlled or eliminated. Blind flanges used for this purpose are to be of sufficient rating to withstand the highest possible pressure that may result.

If a substance is encountered that is hazardous to health and safety, the Worker shall wear appropriate personal protective equipment and respiratory protection while performing the job.

The Contractor shall not perform any Work on operating facilities unless the facility has been isolated, purged, or otherwise made safe.

4.4.8 Locking-Out Equipment

When performing maintenance or repair work on air, fuel, electrical, hydraulic or steam-driven equipment, an approved lockout device must be used in conjunction with other blocking devices as necessary to ensure that all equipment is in a state of Zero Energy. All equipment shall be locked and tagged in accordance with Owner standards and applicable legislated occupational safety and health requirements.

4.4.9 Fall Protection and Overhead Work

Approved fall protection shall be supplied by the Contractor and worn by all workers exposed to the hazard of falling more than 3 metres (10 feet) except when working from an approved scaffold. The protection provided shall ensure that the Worker cannot fall more than 1.5 metres (5 feet). Full body safety harnesses are considered a fall arrestor device. Safety belts do not meet this requirement and are to be used for work restraint only. The use of shock absorbing lanyards are preferred.

Properly mated "D" rings and hooks with locking safety latches are to be used to prevent "roll out."

The areas below overhead work shall be suitably barricaded to protect other workers on the Site. Signs reading "DANGER - WORKERS OVERHEAD" (or equivalent) shall be visibly posted. A safety watch shall be stationed to warn persons in the vicinity where necessary to ensure the safety of other workers.

4.4.10 Respiratory Protective Equipment

Information specific to the Site will be developed in a Respiratory Code of Practice which will be submitted to Owner for approval prior to use.

The Code of Practice will include:

- (a) selection of respiratory equipment
- (b) training
- (c) testing
- (d) cleaning and inspection
- (e) storage

The use or storage of respiratory protective equipment will be recorded and a copy of which shall be maintained on the Site.

4.4.11 Radiography

Only workers directly concerned with radiography shall be in the immediate area of the Work.

Prior to the Work, a radiographic procedure will be submitted to Owner for approval. The minimum requirements to be included in these procedures are as follows:

- (a) No single person units on the Work site.

- (b) No employee of a radiographic inspection company will enter a pipe to perform internal radiography without completing a Safe Work Permit for "Confined Space Entry."
- (c) Procedure to include the need for:
 - (i) barricades or flagging
 - (ii) signage requirements.
- (d) Radiographic inspection trucks to be equipped with 360° amber lights rotating on top of the unit clearly visible to all personnel. Lights will be turned off when x-raying is not in progress.
- (e) Radiographic inspection employees to adhere to all Owner policies, rules, regulations and procedures.
- (f) An emergency procedure, complete with applicable emergency telephone numbers, will be submitted prior to commencement of the Work for approval by Owner. This emergency procedure shall be incorporated into the overall site emergency plan.

4.4.12 Solvents, Paints and Chemical Agents

The Material Safety Data Sheet for each solvent, paint, cleaning agent or chemical used in the Work shall be available at the Site and reviewed with each worker involved in their use or storage prior to handling. All requirements for storage, handling and personal protection outlined therein must be followed. When in doubt concerning these requirements, Owner shall be consulted.

Solvents, cleaners and cleaning agents must not be stored or used in unventilated areas or in immediate proximity to any source of ignition. Quantities of such materials greater than that needed for one day's work must be stored outside work areas in a proper storage facility. Smoking is not permitted while using or in the vicinity of any flammable or combustible controlled product. No Smoking signs must be prominently posted.

4.4.13 Welding and Cutting

Only experienced, authorized workers will be allowed to use welding and/or cutting equipment.

Welders shall wear CSA approved Class (B) hard hats when not actively welding.

Precautions must be taken by welders (and other personnel) to protect themselves from excessive ultraviolet radiation, fire, explosion, asphyxiation or exposure to toxic gases, fumes or dusts when welding or cutting equipment is used.

Welding or cutting in close proximity to facilities which contain explosive products or welding on an existing facility shall only be done under the control of a Safe Work Permit.

All cutting hoses are to be equipped with appropriate flame arrestors or check valves.

All welding equipment and accessories must be maintained in safe working order. Defective equipment must be repaired or replaced.

When cables are laid on the ground they should be protected in such a manner that they will not be damaged or become a tripping hazard.

The ground return line from the work being welded will be a single cable in good repair. The ground return line will only be clamped to the material being welded.

A welder's helper will be adequately protected by wearing:

- (a) flash type glasses with side shields when welding is in progress;
- (b) a full face shield and safety glasses when buffing welds or grinding; and
- (c) safety glasses with side shields shall be worn at all other times.

The welder, or welder's helpers, will ensure that no other worker is in the cutting or spark path before commencing work.

Proper ventilation at the work site must always be maintained.

A serviceable 30# Class ABC dry chemical fire extinguisher, as a minimum, shall be immediately available at a welding and cutting site. Welders and safety watch personnel must be competent in the use of these extinguishers.

4.4.14 Tool Usage

Tools are to be used only for their intended purpose and must be maintained in good condition. Operators are to inspect tools and verify that they are in safe operating condition before starting work. The power must be disconnected from the tool and any pressure discharged before any adjustments are made. Defective tools must not be used. All guards are to be fitted and in good condition. All grinders and grinding discs are to be labeled to indicate maximum rpm and checked for correct size and speed prior to fitting. Appropriate personal protective equipment must be worn when using any tool, including the use of safety glasses and face shields while using a grinder, masonry saw or drill.

The Contractor must meet all Owner and legislated requirements for the use of powered tools and equipment. Only competent persons are to operate any power tool. Only approved, properly grounded electrical tools with three-pronged plugs or double-insulation are to be used. Switch lock-on devices are not allowed on any electrical or air powered tool. Electric tools operating at greater than 32 volts may be used in damp or wet locations only if protected by a ground-fault circuit interrupter.

Explosive-actuated fastening tools are to be used only by trained, competent operators, in accordance with the manufacturer's recommendations.

4.4.15 Temporary Power Sources/Lines

All sources of temporary power (electrical, air, gas, etc.) shall be properly installed, clearly marked, protected from traffic areas, and maintained in good condition. A minimum of two grounding rods are required for each portable generation source.

All distribution lines must be properly supported and must not constitute a hazard to workers.

4.4.16 Abrasive Blasting (Sandblasting)

During abrasive blasting or sandblasting operations the Contractor shall ensure that all legislated Occupational Health and Safety regulations and the following Owner requirements are adhered to:

- (a) A respiratory code of practice will be submitted to Owner for approval prior to commencement of blasting operations.
- (b) All workers exposed to silica dust shall wear CSA approved respiratory protection and all workers who are directly involved in the abrasive blasting shall wear CSA approved face shields or positive pressure hoods specifically designed for blasting operations.
- (c) All workers will be trained in the proper care and use of the respiratory equipment. A record of this training shall be maintained.
- (d) The supplied air equipment shall comply with CSA Z180 (latest edition) for Compressed Breathing Air.
- (e) The positive air pressure shall not exceed 140 kPa during operation.

4.4.17 Blasting

The Contractor shall comply with all provincial Occupational Health and Safety Regulations and the Contract documents for blasting operations.

4.5 Fire Prevention

- 4.5.1 The Contractor shall take all necessary precautions to prevent fires and shall provide, maintain and regularly inspect the required fire extinguishers. Gasoline, volatile solvents or any other flammable substances must be stored in containers that are clearly labeled, approved for their contents and located in a safe place away from any source of ignition. Quantities of chemical in excess of that needed for one day's operation must be stored in an approved storage facility, isolated from the actual work areas. Flammable liquid containers must be electrically bonded when liquids are being transferred from one to another. Suitable fire extinguishers must be available in quantities sufficient to protect the Workers and the Site.
- 4.5.2 Smoking is not permitted near any area where flammable agents are stored, used, or dispensed. Conspicuous signs stating "NO SMOKING OR OPEN FLAME WITHIN 3 METRES OF THIS AREA" must be posted.
- 4.5.3 The fuel tanks of gasoline engines must be filled away from work areas and only when the engines are turned off. Approved safety containers and proper grounding techniques must be used when the tank is not filled directly from the storage container or other source of supply.
- 4.5.4 Vehicles equipped with tidy tanks must have a fire extinguisher on the unit and proper WHMIS and TDG labelling.

4.5.5 All Owner and legislated requirements for disposal of flammable or volatile liquids, rags soaked in such liquids, etc., shall be strictly adhered to.

4.6 Personal Safety

4.6.1 General Conduct

Horseplay, fighting and disregard for the safety requirements will result in permanent removal of those involved from the Site. Running is permitted only during an extreme emergency.

The use of personal stereos (i.e., Walkmans) is strictly prohibited on all Owner Sites.

4.6.2 Clothing and Personal Protective Equipment

The Contractor will ensure that adequate personal protective equipment is worn by all Contractor employees when required by government regulations or by Owner's Health and Safety Rules. This personal protective equipment list includes, but is not limited to the following:

- (a) CSA-approved (Class B) protective headwear (worn in the manner they were designed to be worn).
- (b) CSA-approved hearing protection in areas of high noise levels.
- (c) CSA-approved eye protection, complete with side shields. Goggles must be worn when handling chemicals
- (d) CSA-approved Class-1 (green triangle) safety boots. Athletic style footwear is not permitted.
- (e) Approved gloves.
- (f) Limb and body protection.
- (g) Harnesses, lanyards, and lifelines.
- (h) Where required fire resistant/retardant clothes will be worn.
- (i) Other special safety equipment or clothing requirements as determined by the job hazards (i.e., Carhartts or equivalent are accepted for welders while welding and their helpers, 100% tight-weave cotton limb and body clothing).

Approved hard-hats, safety glasses with side shields and safety boots are the minimum personal protective equipment which must be worn in the proper manner at all times on all Owner construction Sites.

CSA approved industrial eye protection, appropriate for the hazard, shall be worn at all times. When engaged in, or in the vicinity of, work involving the use of power tools, and when welding, cutting, grinding, buffing, sand/grit blasting, hammering, chiseling, drilling, painting, spraying, handling fluids or chemicals or when exposed to injurious light rays, then CSA approved safety glasses complete with CSA approved side shields (hard plastic) must be worn. In other areas, where the potential for eye injury is low, CSA approved safety glasses with slip on (soft plastic) side shields will be accepted.

Each Contractor employee is to wear suitable clothing for the conditions and work being performed. Jewelry and contaminated, torn or saturated clothing that could result in injury or illness to the employee is not to be worn. Where the Work involves potential exposure to flammable or volatile substances, flame-retardant clothing must be worn. Short pants and shirts without sleeves are prohibited. The Contractor shall submit its protective clothing standard for Owner's approval prior to job commencement.

Contractor's shall ensure Workers operating chain saws are equipped with all of the appropriate personal protective equipment required. Safety glasses shall be worn under all face shields except those made of fine mesh. (Under no circumstances shall plastic face shields be worn alone).

Contractor personnel engaged in the work activities identified below shall wear fire retardant clothing at all times.

- (a) Those persons within 50 metres of mechanical excavation within 2 metres of operating facilities (i.e. under or over crossings of buried pipelines).
- (b) Welding or cutting on an existing system.

The fire retardant clothing (e.g.: Nomex) must be worn as the outer garment and meet the "Petroleum Industry Performance Standard for Thermal Protective Clothing" (CPA). Contractor's are also encouraged to wear 100% cotton or wool undergarments.

Workers employed where there is a risk of drowning shall not wear a personal flotation device but an approved life jacket having buoyancy sufficient to keep the Workers' head above water. The device shall not require hand-manipulation to produce buoyancy.

4.6.3 Firearms

Firearms are strictly prohibited in vehicles or on any Owner site.

4.6.4 Manual Material Handling

Whenever practical, mechanical lifting devices are to be used to assist in the handling of material in excess of 34 kilograms (approximately 75 pounds). The Contractor is to ensure that all Workers require to perform manual lifting tasks receive prior instruction on back care and lifting methods. Suitable gloves are to be worn by Workers handling material where contact may be made with sharp edges, abrasive surfaces, slivers, caustics, acids, etc.

4.6.5 Respiratory Protection

Where necessary, approved respiratory protection equipment is to be provided by the Contractor. Workers are to be sufficiently trained and competent in its use and must wear the equipment whenever they may be exposed to an air-borne contaminant exceeding the occupational exposure limit, or when the atmosphere may be oxygen deficient.

4.6.6 Smoking, Matches and Lighters

Smoking is prohibited on Owner facility sites except at posted outdoor locations or where outlined at project kickoff meetings. Special attention should be paid to combustible storage areas and areas where hot line crossings are made.

5.0 PERMITS AND FORMS

5.1 In order that construction proceeds in a safe manner, some work-related items and procedures will require permits and/or form documents.

5.2 Owner will review these requirements with the Contractor prior to implementation of construction activities. The Contractor shall ensure that it complies with these requirements.

6.0 DISCIPLINARY MEASURES

6.1 General

Disciplinary measures and penalties for non-compliance with Owner's Health and Safety Regulations and/or provincial Health and Safety Regulations for all Contractor's and Subcontractors engaged in the Work shall be strictly enforced.

6.2 Violations and Discipline

The following safety regulations are now in effect on all Owner construction sites:

6.2.1 Violation of the following may be cause for permanent removal of personnel from the Site:

- (a) No Worker in the possession of, or under the influence of drugs or alcohol will be allowed on the worksite. Employees must notify their immediate supervisor or the safety department of any prescription being used under the direction of physician. It can then be determined if that employee can carry on work related duties during such time he/she is required to take the prescribed medicine.
- (b) No horseplay (i.e., running, wrestling) on the site, and/or disregard for safety procedures.
- (c) CSA-approved (Class B) hard-hats shall be worn at all times in the way they were intended to be worn (except welders while actively welding).
- (d) CSA-approved Class 1 (green triangle) safety footwear shall be worn at all times. Athletic style footwear is not permitted.

- (e) CSA-approved safety glasses shall be worn at all times. (Refer back to Section 4.6.2)
- (f) Proper dress: shirt (minimum 15 cm sleeve) and pants (no shorts) shall be worn.
- (g) Face shields in addition to safety glasses must be worn when grinding or wire brushing welds.
- (h) Seatbelts must be worn when and where required.
- (i) The use of headphone radio/tape sets is prohibited.

6.2.2 Violation of the following may be cause to remove equipment from the Site:

- (a) proper guards or shrouds shall be in place.
- (b) Backup alarms on tracked equipment to be working at all times.
- (c) Machinery must be equipped with canopies that provide clear operator vision.
- (d) Welding units shall be equipped with fire extinguishers.
- (e) Tools or equipment shall not be defective.

6.2.3 The following may be cause for construction shutdown:

Any unsafe condition or practise, as determined by Owner, until such condition is remedied and/or controlled.

7.0 GENERAL PROCEDURES

- 7.1 All safety and health provisions, as documented herein, shall be incorporated into the Contract Documents for the Work and shall include any project-specific safety concerns.
- 7.2 At the conclusion of the construction pre-job meeting the appropriate personnel will examine, become familiar with and emphasize all applicable safety rules and regulations pertaining to the project, including for Owner:
 - 7.2.1 Resident Construction Supervisor
 - 7.2.2 Assistant Resident Construction Supervisor
 - 7.2.3 Safety Inspector (if available)
 - 7.2.4 Project Manager
- For the Contractor:
 - 7.2.5 Senior Representative (Owner, Vice President, etc.)
 - 7.2.6 Superintendent.
 - 7.2.7 Foremen (if available)
 - 7.2.8 Safety Officer/Designate

- 7.3 Before commencement of each phase of the Work safety meetings shall be held and will include the Contractor's superintendent, foremen and crew, plus the Owner (inspector, safety inspector, etc.) to ensure that all safe work practices applying to the Work are thoroughly understood.
- 7.4 Contractor shall be responsible to ensure that minutes of each safety meeting are documented, and that all safety forms necessary during construction are fully completed and submitted where and when required.

8.0 INTENT

- 8.1 Owner expects the full cooperation of the Contractor and all Contractor personnel in maintaining a safe worksite and in adhering to all Owner Safety and Health Regulations. Continued disregard of these regulations will not be tolerated on Owner's site. Any worker who violates the safety and health regulations will be directed to leave the Site permanently.
- 8.2 Any questions regarding the meaning or interpretation of these regulations, may be directed to Owner for clarification.
- 8.3 All Owner onsite Managers, Construction Safety Officers and Inspectors have the authority to stop work being performed by the Contractor if in the Owner's Managers, Construction Safety Officers, or Inspectors judgement the construction activity is not being conducted in accordance with this Construction Manual or is creating a hazard to anyone on the construction site.

