



**Environment, Health and Safety
Specifications and Requirements
For Contractors**



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Revision Table

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1 INTRODUCTION

These specifications and requirements are to be effectively integrated into contractors' safety and environment management system and plans. Where a project has identified specific requirements, both are applicable and the most stringent apply.

Contractors must actively promote safe working performance on the part of their employees and personnel and must implement and participate in activities to provide safe working environments.

The requirements are not intended to be an all-inclusive or definitive set of rules to meet all situations; however, they are the minimum acceptable levels of performance all contractors must adhere to. Contractors must ensure their subcontractors receive and adheres to these specifications and requirements as a minimum level of performance. Where there is conflict between regulations, codes, standards, best practices or AltaLink requirements, the most stringent shall apply.

The contractor, for the purpose of this document, unless otherwise specified, refers to both contractors and sub-contractors.

1.1 Distribution of Information

AltaLink has a website available to contractors that contains the specifications and requirements for contractors and the various AltaLink standards that must be followed. The site also contains internal AltaLink standards, which contractors can use as reference documents to develop their own standards.

All safety and environment documents that are referenced in this document can be downloaded from the Contractor Safety website. In section 15 there is a table listing all safety and environment documents that are referenced in this document.

AltaLink's safety initiatives include distributing safety bulletins and incident alerts for any class 2 and 3 incidents that have occurred on our sites. These bulletins and alerts should be reviewed so workers are aware of safe work practices and informed of incidents so discussions can take place to prevent similar incidents from recurring. Contractors are responsible for forwarding these safety bulletins and incident alerts to their sub-contractors who are working on AltaLink sites. These bulletins and alerts are also found on the contractor website.

To obtain access to the Contractor Safety website, send a request to healthandsafetyadministrator@altalink.ca.

2 CONTRACTOR REQUIREMENTS

2.1 AltaLink Corporate Health and Safety Policy

Contractors are expected to comply with *AltaLink Corporate Health and Safety Policy (ALS-1081)*. This policy establishes the values and principles that guide AltaLink's commitment to their employees, their contractors, customers and the public. All contractors need to be knowledgeable about the policy and be responsible and accountable for understanding and incorporating health and safety requirements into their daily work activities with the obligation to meet or surpass all legislation, regulations and other applicable requirements. The policy is available on the Contractor Safety Site.

2.2 Acts, Regulations, Laws and Codes

Contractors must at all times during the performance and execution of the services abide by and be responsible for meeting or exceeding all applicable federal, provincial and local laws or regulations.

Any act, regulation or safety code exemption that has been applied for and/or granted to any contractor performing work must inform AltaLink and submit all relevant information for review and approval by AltaLink for their work sites.

2.3 Contractor EHS Management

AltaLink contractors complete new project construction, repairs, replacements, and upgrades to the existing facilities. AltaLink works closely with contractors to ensure successful safety performance.

A process has been established to foster a strong safety relationship between AltaLink and the contractors. This process includes:

- Selection and qualification;
- Expectation setting;
- Pre-work planning;
- Oversight during work execution; and
- Feedback / communication during and after the work.

All contractors performing work for AltaLink are required to be qualified through the procurement department using a 2-tiered approach.

Contractors are required to subscribe to ComplyWorks. AltaLink as the owner has the capacity to access contractor information through the ComplyWorks system.

It is AltaLink's expectation that contractors maintain information to ensure their status is current and ensure the following are maintained:

- Insurance requirements,
- Workers Compensation Requirements,
- Performance statistics,
- Environment, Health and Safety Management Program.

Helicopter contractors have additional prequalification requirements that are needed for ComplyWorks. The prequalification requirements are found in section 9.5.3.1 related to helicopter requirements.

2.4 Acceptance of Prime Contractor

Where AltaLink assigns and the contractor accepts the role of prime contractor, ALS-2012: *Prime Contractor Standard* is followed. All aspects of this specification are inclusive in the role of prime contractor.

2.5 Alcohol, Drugs and Substance Abuse

Contractors are required to have an alcohol and drug policy in place and effectively implemented for workers under their employment while performing AltaLink work. Refer to AltaLink safety standard:

- ALS-2026: *Alcohol and Drug Standard for Contractors*

2.6 Life Saving Rules

The *Life Saving Rules* are to reinforce the importance of following the controls that are put in place for our most common critical hazards. Deviation from these controls for any reason could result in very serious injury or worse.

All individuals performing work for AltaLink and/or on an AltaLink worksite for any reason must follow these rules.

Non-compliance with the Life Saving Rules, pending investigation outcome, may result in disciplinary action up to and including permanent removal from site.

Table 1: Life Saving Rules

Focus Area	Rule
Permission to Work	Before proceeding to perform work, you must first receive permission to work from the proper authority controlling the work site.
Isolation Points	You must not remove or modify any safe isolation points without authorization.
Safe Work Planning and Hazard Assessment	Prior to starting work, and when the work condition change, you must conduct a hazard assessment and have a safe work plan.
Working at Heights	When working at heights of 3 metres and above, you must use fall protection.
Limits of Approach	When required to work around energized equipment, you must observe and maintain your limits of approach distances.
Grounding	When grounding is required, you must have and follow a documented grounding plan to ensure the worksite is safely grounded and bonded.

Mechanical Lifting Devices	When using mechanical lifting devices, you must ensure the equipment is certified, you are trained to operate it, and the rigging is appropriate for the load.
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2.7 Worker Right to Refuse Dangerous Work

Contractors are required to follow the steps in the *Alberta Occupational Health & Safety Act* for work refusals. Workers have a right to refuse work that creates an “undue hazard” at the worksite. An “undue hazard” includes a hazard that poses a serious and immediate threat to the health and safety of a person.

A worker may refuse to work or to complete a particular task, if the worker believes on reasonable grounds that there is an undue hazard at the work site or the work constitutes an undue hazard to the worker’s health and safety or to the health and safety of another worker or person.

The work refusal is required to be reported to their employer, supervisor or person designated by the employer. On AltaLink sites, workers are not permitted to engage in work tasks they are not adequately trained to perform.

2.8 Respect in the Workplace

AltaLink is committed to providing a work environment in which all individuals are treated with respect and dignity. Every person has the right to work in an environment that is safe, healthy and free from harassment, violence and discriminatory practices.

This applies to all AltaLink employees and to individuals from outside the company that have interactions with AltaLink employees, such as, but not limited to, contractors, suppliers, consultants, clients and business partners. If a complaint is received against an individual from outside the company, AltaLink will contact their employer immediately.

2.9 Smoking and Vaping

Contractors must comply with the *Tobacco Reduction Act*. As a minimum contractors are required to:

- Designate a smoking/vaping area,
- Provide receptacles for safe disposal,
- Post signage.

2.10 Workplace Hazardous Materials Information System

Contractors are required to comply with the requirements of Part 29 of the *Alberta Occupational Health and Safety Code* for any hazardous materials. If a product is used, stored, handled on a worksite, the prime contractor or if there is no prime contractor, the contractor responsible for that work site must ensure that:

- The controlled product is labelled.
- The most current safety data sheet (SDS) is readily available to the workers on site.

- The worker who works with or is in proximity to the controlled product receives training with respect to the controlled product.

2.11 Working Alone

Contractors are required to have a program in place for effective communication with workers who are working alone, both during normal and unexpected work situations, as outlined in Part 28 of the *Alberta Occupational Health and Safety Code*. This includes workers required to travel alone to remote locations or where there is no routine interaction with other people. This communication system can consist of radio communication, landline or cellular communication or some other effective means of electronic communication that includes regular contact with the worker at appropriate intervals. The contractor needs to perform a hazard assessment and complete written safe work procedures prior to any situation where a worker is working alone.

2.12 Resumes of Key Project Personnel

Upon request, AltaLink may require a contractor to submit resumes of the persons proposed to occupy leadership positions within the organization. A definition of reporting relationships of corporate individuals and project assignees may also be required, where applicable.

2.13 Contractor Designated Health and Safety Professional(s)

AltaLink believes that contractor leadership is accountable and responsible for managing the health and safety aspects of the work and for the work performed by the crews. Work leaders, supervisors, persons-in-charge are accountable for the work and are responsible for the health and safety performance of all personnel while in the areas of control.

The following information specifies when a health and safety professional is required, and section 13 in this standard outlines the safety related duties and reporting requirements while working on a project. As a minimum, when on a per shift basis there is a total of:

- 1 to 10 Contractor employees and/or subcontracted workers on site – the contractor’s highest level of authority on site must be responsible for all health and safety activities and duties. Every two weeks, a designated member of management is to complete a safety inspection on each crew.
- 11 to 25 Contractor employees and/or subcontracted workers on site – the contractor’s highest level of authority on site must be responsible for all health and safety activities and duties with the assistance of a part-time designated health and safety professional who must attend the project site once per week performing safety related functions (i.e. safety inspections, observations, meetings, etc.) and spend a minimum of four hours on site per visit.
- 26 to 100 Contractor employees and their subcontracted workers on site – the contractor’s highest level of authority on site must be responsible for all health and safety activities and duties with the assistance of a full-time designated health and safety professional.

- 101 to 200 Contractor employees and/or subcontracted workers on site – the contractor’s highest level of authority on site must be responsible for all health and safety activities and duties with the assistance of two full-time designated health and safety professionals Performing safety related functions. Safety professional hours should be reflective of the shifts worked on the project.

NOTE: As each additional century mark is reached an additional full time health and safety professional is required.

AltaLink, while acting in a reasonable manner, reserves the right to ask the contractor to remove and replace the health and safety professional(s). Health and safety professionals are required to have relevant certification and training and have successfully completed any of the following:

- Occupational Health Safety Certificate
- Canadian Registered Safety Professional
- National Construction Safety Officer
- Canadian Registered Safety Technician
- Others deemed competent by the contractor to act as a safety representative and required to be approved by AltaLink.

2.14 Site Work Leaders

Contractors must ensure that site leadership is trained and competent to perform their roles.

Knowledge and abilities that leadership need to have include, but are not limited to, the following:

- Knowledge of the laws and regulations applicable to the work to be performed.
- Knowledge of and expertise in the applicable safe work practices.
- Knowledge of hazard identification and controls related to the work to be performed.
- Ability to respond to work site emergencies.
- Knowledge of the duties and responsibilities of all workers supervised.
- Ability to delegate duties to qualified individuals when appropriate.

2.15 Training

Contractors are required to provide a site-specific orientation that incorporates AltaLink content as specified.

Ensure all workers are trained and competent in the specific aspects of their work during all phases of the project. Workers are required to be fully aware of the hazards and the associated controls.

All training material, written rules and procedures and work site signs/instructions, are in languages that can be readily understood by the worker. If this is impractical, a translator is required. These AltaLink standards outline the requirements while on AltaLink sites:

- ALS-1717: *Safety Certification Standard,*
- ALS-1942: *Process for Obtaining Switching, GOI and Grounding Certifications.*

2.16 Competence and Awareness

Contractors need to be technically competent to perform their work and understand applicable requirements, responsibilities and industry best practices.

Contractors are required to ensure that subcontractors understand their responsibilities and are competent to perform their work.

3 INCIDENT MANAGEMENT

Contractors must report to AltaLink all incidents that occur when they are working on AltaLink projects. This requires contractors to have a documented incident management system in place for reporting, notifying, investigating and analyzing all incidents.

Contractors are required to review incident findings, make recommendations, and develop action plans to prevent similar incidents.

3.1 Incident Categories and Classifications

Contractors may have their own classification system for the purpose of reporting near misses and incidents. When reporting to AltaLink, the AltaLink classification system is followed.

Incidents may be categorized as:

- Hazards
- Near misses
- Injury/illness
- Environment
- Power loss
- Reliability
- Physical security
- Property damage
- Vehicle Incident
- Fire

When near miss incidents happen, no harm, injury, illness or damage occurred; however, the situation was such that there was potential for a more serious outcome. Near misses are classified as either class 1 or 2.

The other categories (injury/illness, environment, power loss, physical security, property damage, vehicle incidents and fire) are classified as class 1, 2 or 3 depending on actual outcome and/or potential outcome. The most significant outcome across all categories is used to classify the incident.

An incident may have multiple impacts or the potential for impact, such as an injury, asset damage and environmental. In these cases the incident is classified according to the most serious outcome and/or potential outcome.

Table 2 is used for guidance when establishing the severity of the actual outcome and/or potential outcome.

Table 2: Categories and Classifications

Hazards	
Class 1	<p>Examples:</p> <ul style="list-style-type: none"> • Poor housekeeping. • Missing security tags or keys. • Doors/ gates/ padlocks left unlocked or open. • Slightly worn components on a vehicle or equipment. • External hazards or damage to perimeter fence. • Bonds or grounds are damaged prior to entering the site. • Visual evidence of release of electrical insulating oil from in-service equipment as a result of normal equipment operation of an estimated volume of <200L. • Wildlife interactions that do not result in injury or mortality but require mitigation or other corrective actions.
Injury/Illness	
Class 1 Near Miss	<p>Examples:</p> <ul style="list-style-type: none"> • Non treatment incidents. • Slip or trip or fall but no injury
Class 2 Significant Near Miss	<p>Examples:</p> <ul style="list-style-type: none"> • Potential for a significant injury. • Open excavation that is not barricaded or signed. • Mobilizing equipment near an unidentified power line. • Working at heights without wearing the required personal protective equipment. • Isolation incidents (e.g., guarantee of isolation, construction isolation, switching, recloser block, grounding). • A breach of using or following a procedure, process or standard that had the potential for a significant incident. • Unsecured load where equipment fell – no impact to public or property. • Mobile equipment upset. • A violation of limits of approach or overhead or underground power line contact that did not result in injury or power loss but had the potential to do so. • A compliance or stop work order from a government body (applicable for safety incidents only). • Entering a facility without checking in with the person-in-charge.
Class 1 Injury/Illness	<ul style="list-style-type: none"> • First aid as per definition.

Class 2 Injury/Illness	<ul style="list-style-type: none"> • Lost time incident. • Restricted work or occupational injury or illness as per definition. • Medical aid as per definition.
Class 3 Injury/Illness	<ul style="list-style-type: none"> • Fatality.
Environment	
Class 1 Near Miss	<ul style="list-style-type: none"> • Release of less than 5 litres of: <ul style="list-style-type: none"> ○ In-service polychlorinated biphenyl (PCB) electrical insulating oil (<50 ppm) resulting in a cumulative PCB release of <0.75 grams. ○ Any environmentally sensitive liquid (not including battery acid). • Any non-conformance with an AltaLink standard, procedure, or project specific environmental requirement that can be rectified immediately.
Class 2 Significant Near Miss	<ul style="list-style-type: none"> • A release of in-service polychlorinated biphenyl (PCB) (PCB) electrical insulating oil (<50 ppm) resulting in a cumulative PCB release of >0.75 grams of PCB but less than 1.0 grams of PCB. • An action or event that had the potential to result in a Class II environmental incident.
Class 1	<ul style="list-style-type: none"> • Release of greater than 5 litres of: <ul style="list-style-type: none"> ○ In-service polychlorinated biphenyl (PCB) electrical insulating oil (<50ppm) not resulting in a cumulative PCB release of >0.75 grams. ○ Any environmentally sensitive liquid (not including battery acid). • Any release of battery acid <5L. • A release of a greenhouse gas (i.e., refrigerants, SF6, CF4) less than 10 kg or less than a 10 minute sustained release. • An activity that results in the death or injury of wildlife listed as “non-licence animals.” • Discovery of dead or injured wildlife on or within AltaLink facilities or rights-of-way. • Any non-conformance with an AltaLink environmental specification, requirement, standard, or procedure that cannot be rectified immediately.

<p>Class 2</p>	<ul style="list-style-type: none"> • A release of a product or substance to the environment in excess of the quantities identified in Appendix 1 - AltaLink Release Reporting Requirements. • A product or substance released in any volume to a surface water body (including a wetland or watercourse) or groundwater. • The disposal of waste at an unauthorized waste management facility. • An activity that results in the disturbance or death of a migratory bird, disturbance or destruction of legally protected habitat, or injury/death of a species-at-risk. • Deposition of a substance that is harmful to migratory birds, or permitting such a substance to be deposited, in waters or an area frequented by migratory birds or in a place from which the substance may enter such waters or such an area. • Commencement of construction, operations, or maintenance activities or works without the proper environmental approvals or notifications in place. • Any activities or works that are in non-compliance with the conditions of provincial or federal regulations, legislation, authorization, or approval. • Formal notice of investigation or an environmental order issued by a provincial or federal environmental regulatory agency issues.
<p>Class 3</p>	<ul style="list-style-type: none"> • Stop work order from a provincial or federal environmental regulatory agency. • Incident resulting in a significant adverse effect on the environment. • Charges, fines, or administrative penalties laid by a provincial or federal environmental regulatory agency.
<p>†Power Loss (This is only taken into effect when the incident is human driven.)</p>	
<p>Class 1</p>	<ul style="list-style-type: none"> • Any human performance issue arising from activities at substations, control centers, telecom/network, energy management systems (EMS) or operational engineering that have an unexpected consequence, and puts the system/load, or the ACC's ability to manage the system, at a higher level of risk. <p>NOTE: Class 1 power loss events are reported and investigated according to guidelines for class 2 or 3 incidents.</p>
<p>Class 2</p>	<ul style="list-style-type: none"> • Any human performance issue arising from activities at substations, control centers, telecom/network, engineering management standards or operational engineering that have an unexpected consequence, and results in loss of load or generation within the following ranges: <p>Load - Loss of 0-299MW Generation - Loss of single or multiple units totaling 0-499MW</p>

<p>Class 3</p>	<ul style="list-style-type: none"> Any human performance issue arising from activities at substations, control centers, telecom/network, engineering management standards or operational engineering that have an unexpected consequence, and results in loss of load or generation within the following ranges: <u>Load</u> - Loss of $\geq 300\text{MW}$ <u>Generation</u> - Loss of single or multiple units $\geq 500\text{MW}$
<p>Security</p>	
<p>Near Miss Class 1</p>	<ul style="list-style-type: none"> Vehicle left unlocked Office doors/gates left open, reported to security
<p>Class 1</p>	<ul style="list-style-type: none"> Property damage to exterior of site (e.g., perimeter fence, building, etc.) Unauthorized access into a secured AltaLink Site(e.g. break-in, tailgate, etc.) Minor property or asset damage (e.g., camera broken, vehicle damaged, vandalism etc.). Trespassing (e.g., climbing towers, onto private property, etc.). Car prowling with access into vehicle. Correspondence/ contact with no or minor threat of harm or damage Lost or stolen security access device (e.g. keys, access card, FOB) Theft where stolen items are valued between 0 – \$15,000 Theft from an external contractor working for AltaLink but nothing of AltaLink’s property or assets. Security system offline for (<1hour) Evacuation of an AltaLink site due to an unsubstantiated threat or event (e.g. alarm monitoring)
<p>Class 2</p>	<ul style="list-style-type: none"> Significant property damage (e.g., shooting line insulators, damaging breakers inside substation by striking it with objects). Unauthorized access or trespassing with malicious intent beyond theft or vandalism(e.g. sabotage, power disruption, gaining access to BES, etc.) Correspondence / contact with significant threat or harm or damage (e.g. bomb threat, violence). Lost or stolen Grand Master (facility buildings) and CIP keys. Confirmed use of any lost or stolen security access devices (e.g. keys, access card, FOB) Theft where stolen items are valued between \$15,000 – \$250,000 Security system offline for a significant period (>1hour) Physical attack on employee with minor injuries Partial or temporary disruption or reroute of power (planned or unplanned) as a result of a physical security incident. Evacuation of an AltaLink site due to a substantiated threat or event (fire, gas, flood suspicious package, etc.)

Class 3	<ul style="list-style-type: none"> • Complete de-energization of one or more substation or telecom sites as a result of a physical security incident. • Physical attack on employee resulting in significant injuries/ fatality. • Theft where value of stolen items exceeds \$250,000.
Vehicle / Property	
Class 1	<ul style="list-style-type: none"> • Vehicle damage under \$5,000. • Property damage under \$100,000.
Class 2	<ul style="list-style-type: none"> • Vehicle damage above \$5,000. • Property damage between \$100,000 and \$999,999.
Fire Incidents	
Near Miss	<ul style="list-style-type: none"> • An ignition has originated on an AltaLink asset (substation equipment and/or lines) and the fire is contained to the asset/structure, but there is no evidence or indication the fire has spread to another fuel source. Example: cross arm and/or pole fires where the flame is contained to the structure.
Class 1	<ul style="list-style-type: none"> • An ignition has originated from an AltaLink asset or employees / contractors and spread to another fuel source but did not require suppression efforts by a third party. The fire has no impact to human life, but may have a small impact on adjacent property (e.g. damaged to a nearby fence).
Class 2	<ul style="list-style-type: none"> • An ignition has originated from AltaLink assets or employees/contractors and has spread to another fuel source, requiring third party suppression efforts. • The fire may have some impact on adjacent property, but no impact to human life. The cost of fire response is <\$200k.
Class 3	<ul style="list-style-type: none"> • A fire originated from AltaLink assets or employees/contractors, which results in a material impact to property/ communities or impact to human life. AltaLink's cost of fire response is >\$200k.

†All power loss events are captured and investigated within The Transmission Outage Statistics System within System Operations including power losses less than the class 1 criteria.

3.2 Reporting and Investigating

All near misses or actual incidents that occur during work must be reported to the AltaLink project manager. Incident notification and reporting requirements vary depending on type and classification of incident. Refer to Table 3 for classification and reporting requirements.

Depending on the severity or potential severity of an incident, post incident alcohol and drug testing may be required as part of the investigation. Refer to ALS-2026 – *Alcohol and Drug Standard for Contractors* for guidance.

Table 3: Classifications and Reporting Requirements

Injury / Illness, Environment, Power Loss, Security / Reputation and Asset Damage	Verbal notification within 2 hours	Preliminary report required within 24 hours	24 hour conference call required	Root cause methodology investigation and action plan required	Final report required within 7 calendar days	Final report required within 48 hours including learnings
Class 1	Yes	Yes	No *	No **, **	Yes	No
Class 2	Yes	Yes	Yes	Yes	Yes	No
Class 3	Yes	Yes	Yes	Yes	Yes	No
Near Miss Reporting						
Class 1 Near Miss	No	No	No	No	No	Yes ***
Class 2 Near Miss	Yes	Yes	Yes	Yes	Yes	No
<p>* Class 1 power loss events are reported and investigated according to guidelines for class 2 or 3 incidents.</p> <p>** Upon request from an AltaLink project manager, a root cause methodology investigation may be required.</p> <p>*** As a minimum, the report must include the information outlined below. If a contractor has a document that includes or exceeds this information it will be accepted. ALS-2006F1: Class 1 Near Miss Report can be used if contractor does not have a form. See ALS-2006F1 on the Contractor Safety Website.</p>						

3.2.1 Class 1 Near Miss Report Information Requirements

The following information must be included when reporting a class 1 near miss:

- Date / Time
- Contractor – Organization contracted directly to AltaLink
- Sub-Contractor – Organization that experienced the incident (if different)
- AltaLink project manager
- AltaLink project number
- Title identifying the incident
- Description of events
- Immediate actions
- Learnings

3.2.2 Class 2 Near Misses and Incidents

AltaLink requires the incident is reported within 2 hours of the incident occurring. The vice president of the organizational unit where the incident occurred conducts a conference call within 24 hours of the class 2 or 3 near miss or incident being reported. At a minimum, the call must include the organizational unit manager, director, vice president EHS and contractors as required. The reason for the conference call is to discuss the incident and review immediate actions taken.

When investigating an incident, root cause methodology must be used.

AltaLink reserves the right to:

- Request an investigation of any incident.
- Participate in a contractor's investigation team or to perform a separate investigation.
- Request to have available all information and personnel related to an incident under investigation.
- Request copies of all documentation from the contractor to facilitate the investigation process.

3.3 Incident Management Procedure

When an incident occurs, managing the incident begins promptly, starting with securing and controlling the scene, completing an investigation and determining an action plan.

3.3.1 Controlling and Securing the Scene

In order to prevent further possible losses, immediate remedial actions must be taken at the incident scene and incident information must be reported. When an incident occurs, the person-in-charge must do the following:

- Take control of the scene:
 - Stop all work if necessary.
 - Access for hazards.
 - Secure the site to minimize the risk of further injury, property or environmental damages.
- Ensure first aid and call for emergency services as needed:
 - Refer to the Emergency Contact List and Project Emergency Response Plan.
- Control potential secondary incidents:
 - Actions need to consider the consequences.
- Preserve the scene:
 - Cordon off the site and keep others away so the scene remains as undisturbed as possible.
 - Notice people who leave the scene.
 - Ensure that no material or equipment is moved.
- Preserve evidence:
 - Position (photos, sketches, measurements).
 - People (witness statements).
 - Paper (safe work plans, procedures, permits, etc.).
 - Parts (view and examine physical items).
- Notify the AltaLink Project Manager and investigate as per Table 3: Classifications and Reporting Requirements.

4 NOTIFICATIONS TO A GOVERNMENT BODY

4.1 Safety Incident and Significant Near Miss

When an injury or incident or any other incident that has the potential of causing serious injury to a person occurs at a work site, the prime contractor or, if there is no prime contractor, the employer is

required to verbally report the time, place and nature of injury or incident to a government body as soon as possible.

Incidents where AltaLink is the prime contractor, AltaLink EHS Department is required to verbally report the time, place, and nature of injury or incident to a government body as soon as possible.

AltaLink requires notification of an incident or injury prior to notification to a government body. Reporting requirements are summarized below:

Table 4: Safety Incident Notification Requirements to Government Body

SAFETY	
Incident	<ul style="list-style-type: none"> • An injury or accident that results in death of a worker. • An injury, illness or incident in which there is a reason to believe the worker has been or will be admitted to a hospital beyond treatment in an emergency room or urgent care facility. • An unplanned or uncontrolled explosion, fire or flood that causes a serious injury or that has the potential of causing a serious injury. • The collapse or upset of a crane, derrick or hoist. • The collapse or failure of any component of a building or structure necessary for the structural integrity of the building or structure. • Any injury or incident or a class of injuries or incidents specified in the regulations.
Significant Near Miss	<ul style="list-style-type: none"> • Incident that has the potential of causing serious injury to a person.
Regulatory Agency	Alberta Occupational Health and Safety
Verbal Notification Requirements	Verbal notification must be made by the prime contractor as soon as possible when an incident occurs.
Reporting Requirements	<ul style="list-style-type: none"> • Prepare a written report outlining the circumstances of the injury or incident and the corrective action undertaken to prevent a recurrence of the injury or incident. • Complete all required internal reporting prior to submitting the final report to a governing body. For example Alberta OH&S. • Provide a copy of the report to a government body. • Provide a copy of the report to the Joint Work Site Health and Safety Committee.

4.2 Regulatory Reportable Environmental Incident

An incident may require immediate verbal notification and may need to be followed by a written report to a government body by the prime contractor. Prior to making verbal notification to a regulatory agency, the prime contractor shall notify the AltaLink environmental manager in order to confirm incident classification. Verbal notification and reporting requirements for each incident type are summarized below:

Table 5: Environmental Incident Notification Requirements to Government Body

ENVIRONMENT	
Incident	Any class 2 or 3 environmental incident as described in Table 2 in section 3.
Regulatory Agencies	<ul style="list-style-type: none"> • Alberta Environment and Parks (AEP) • Fisheries and Oceans Canada • Environment and Climate Change Canada (ECCC)
Verbal Notification Requirements	<ul style="list-style-type: none"> • Where an incident occurs that requires verbal notification to be made to AEP or ECCC. The contact information for the prescribed authority is: AEP 24-Hour Environmental Hotline (1-800-222-6514)
Reporting Requirements	<ul style="list-style-type: none"> • The person responsible for the verbal notification must prepare a written letter report and submit it to AEP within 7 calendar days. • The AltaLink environmental manager will prepare a transmittal letter to accompany the AEP written letter report.
Incident	<ul style="list-style-type: none"> • When a release or anticipated release meets the requirements under S8.2 and/or S8.4 of the <i>Transportation of Dangerous Goods Regulation (TDGR)</i>. • <i>Release or Anticipated Release Reporting</i> is required in all instances in which a means of containment is damaged (e.g., in an accident or through handling) such that its integrity is compromised in a way that may lead to a release. • There are exemptions for release reporting if the dangerous goods meet the requirements of the 150 kg exemption. Refer to the TDGR S. 1.15 for more information.
Regulatory Agency	Transport Canada (TDGR S. 8.2, 8.3, S. 8.4, 8.5)
Verbal Notification Requirements	<ul style="list-style-type: none"> • The person who has possession of the dangerous goods at the time of the release or anticipated release must make the verbal notification(s). • If a release or anticipated release meets TDGR S. 8.2, an Emergency Report must be made immediately to local police and the appropriate provincial authority: Alberta Environmental and Dangerous Goods Emergencies (24 hour) (1-800-272-9600) • Following local and provincial notifications above, if a release or anticipated release meets TDGR S. 8.4, a Release or Anticipated Release Report must be made to CANUTEC (1-888-226-8832) • Following local, provincial, and federal notifications, the release or anticipated release must be reported to the consignor of the dangerous goods.

Reporting Requirements	<ul style="list-style-type: none"> • An Emergency Report must meet the requirements identified in TDGR S. 8.3. • A Release or Anticipated Release Report must contain the information outline in TDGR S. 8.5. • When a release or anticipated release report is made, the person responsible for the verbal notification must prepare and submit a 30 day follow-up report and submit it in writing to the Director General and the AltaLink environmental manager within 30 days after the day the initial report was made. • The 30 day follow-up report must contain the information outlined in TDGR S. 8.7.
Incident	<ul style="list-style-type: none"> • Commence of work without <i>Historical Resources Act</i> approval. • Disturbance of known historical resources. • Disturbing previously unknown historical resources.
Regulatory Agency	Alberta Culture, Multiculturalism, and Status of Women
Verbal Notification Requirements	Immediately contact the AltaLink environment department, who will immediately contact the Minister of Alberta Culture, Multiculturalism, and Status of Women

5 HEALTH AND SAFETY STATISTICAL REPORTING

Contractors are required to track health and safety performance statistics for the work and submit the information to AltaLink on an agreed upon time frame. Proactive and reactive measures are monitored and reported. As a minimum, all information must be submitted monthly, prior to the fifth calendar day of the month. This following information can be submitted to ComplyWorks program:

- Total worker exposure hours in the month.

6 FIRST AID, MEDICAL AND EMERGENCY RESPONSE

6.1 First Aid and Medical

The contractor must have a documented program in place to ensure Part 11 and Schedule 2 of the *Alberta Occupational Health and Safety Code* requirements have been met.

6.2 Emergency Preparedness and Response

The contractor must have a written emergency response plan as outlined in Part 7 of the *Alberta Occupational Health and Safety Code* to handle all emergency situations that could arise on the site. This plan must be effectively communicated to personnel and key response information affixed at strategic locations in the workplace.

In addition to the requirements in the *Alberta Occupational Health and Safety Code* the emergency response plan must also include:

- A site specific transportation plan, with a map and preferred route to the nearest medical facility.
- Emergency phone numbers.
- Designated workers to supervise, perform emergency response activities.
- STARS Vigilant Emergency Communications Centre phone number (1-888-888-4567).

Note: All workers on site are required to sign off on the emergency response plan indicating they understand and are comfortable with executing the plan.

6.2.1 STARS Vigilant Emergency Communications Centre

The STARS Vigilant Emergency Communications Centre is the first point of contact in the event of a significant injury or medical emergency.

The STARS Vigilant Emergency Communications Centre site identification number (ID#) must be in place before work begins. The *Stars Vigilant Site Identification Number for Temporary and Permanent Sites ALS-2062* outlines the requirements for setting up permanent and temporary worksites.

- If an injured worker is transported to a medical facility using transportation from the worksite, the worker is accompanied by at least one first aider in addition to the operator of the transportation.

6.3 Rescue

- Worker(s) are trained in rescue procedures appropriate to the worksite and the potential emergencies identified on the emergency response plan.
- Worker(s) need to be designated to perform rescue duties and documented on the emergency response plan.
- Rescue equipment is required to be in the immediate vicinity of the work activities and readily available.
- A minimum of two appropriately trained workers must be readily available to perform rescue duties if needed.
- Mock rescues/ tabletop exercises are performed and documented at reasonable intervals based on the emergency response plan.

7 HAZARD MANAGEMENT AND CONTROL

7.1 Hazard Management

Contractors must meet or exceed the governing provincial laws and regulations regarding the necessity for formal hazard and risk assessments to be performed prior to work commencement.

Contractors are required to conduct hazard assessments at each work phase and whenever there is a significant change in the physical or environmental conditions on the work site. All manner of hazards—

physical, chemical, electrical and environmental—are identified, assessed, and eliminated if possible. If elimination is not possible, adequate controls must be devised and implemented.

Prior to initiating work, the nature of the work to be performed is reviewed on a task-by-task basis. Tasks seen to have a significant potential for harm to personnel, environment or equipment are identified for a more rigorous hazard assessment.

Contingency actions are pre-planned to cover the circumstances of a possible loss of control of a hazard. The plans account for the possible escalation of consequences due to loss of control of a hazard.

Results of hazard management activities are recorded and kept on site. The documents include a description of the hazard(s), the possible adverse scenarios, controls needed to contain the hazard(s), and protective and precautionary measures for personnel and the environment.

Workers are required to be fully aware of all identified hazards and controls and have signed off on the assessment.

7.2 Tailboard Meetings

Individual work crews are required to hold a documented tailboard meeting prior to work commencement. The tailboard documents include the following information:

- Supervisor in charge.
- Emergency response information.
- A description of the work to be performed.
- [Medium Impact Substations Only] Confirmation that a Request for Change (RFC) number is assigned and approved for the full scope of work to be performed.
- Existing and potential hazards associated with the work.
- Methods used to control or eliminate the hazards identified.
- All specific actions required from a safe work permit if one is issued.
- Signatures from all personnel involved to show they have participated in the hazard assessment and they are aware of the hazards and the identified control measures.

The documented tailboard meeting process are repeated:

- Daily.
- When change to work scope is introduced.
- When there is a change in the worksite conditions.
- When unforeseen or unplanned complications arise.
- After any incident.
- As required to prevent the development of unsafe and/or unhealthy working conditions.

Close Out Meeting

At the end of the day, a safety close-out meeting is required, giving workers the opportunity to sign off indicating there are no unreported injuries, incidents or new hazards as a result of the day's activities.

7.3 Work Authorization

An authorization for work provided to a contractor must be in the form of a *Prime Handover or Construction Authorization Document*. Contractors must return these to AltaLink, and not issue to other contractors. Where a contractor accepts the role of Prime Contractor and has the proper documentation in place, they are required to authorize work via permits at AltaLink work sites. The work authorization system used on the project is in effect from the start of construction.

Note: This system needs to be in alignment with the requirements contained in the following AltaLink safety standards:

- *ALS-1717: AltaLink Safety Certification Standard,*
- *ALS-1942: AltaLink Process for Obtaining Switching, GOI and Grounding Certifications,*
- *ALS-818: Facility Isolations,*
- *ALS-1994: Field Reliability Work Practices Standard.*

8 PERSONAL PROTECTIVE EQUIPMENT

8.1 General Face Shields, Boots and Hats

Contractors must have a program in place that meets or exceeds the requirements of Part 18 of the *Alberta Occupational Health and Safety Code*. The selection of personal protective equipment is determined by the results of the hazard assessment and regulatory compliance. In addition, the personal protective equipment requirements are selected in accordance with specific Safety Data Sheet (SDS) requirements.

Contractors must ensure all personnel including subcontractors, visiting or working on the AltaLink work site complies with the minimum personal protective equipment requirements. This equipment must include, but not be limited to, Canadian Standards Association (CSA) approved, where applicable:

- Hard hat
- Safety boots
- Protective eyewear
- High visibility clothing
- Hand protection appropriate for the task

At all AltaLink worksites, long sleeve shirts and long pants must be worn.

Contractors are responsible to ensure proper protective equipment is available, maintained and used in accordance with governing laws and regulations.

8.1.1 PPE Exceptions

Based on a formal hazard assessment of a work area, all of the minimum PPE outlined in section 8.1 may not be required during the performance of some indoor activities where certain hazards do not exist.

This exception may include activities such as when working at a computer station, reading prints or performing tailboards. All minimum PPE must always be readily available and used otherwise.

8.2 Eye and Face Protection

The *Alberta Occupational Health and Safety Code* requires workers be protected by PPE that is approved to the *CSA Standard Z94.3 Eye and Face Protectors*. Workers performing activities that could produce hazards (but not limited to) such as heat, sparks, splash from molten metals (e.g., grinding, cutting) and small debris, such as metal filings are required to wear a Class 6C face shield. In addition, workers engaging in these activities are required to wear sealed safety glasses or Class 2B safety goggles beneath the required face shield.

Face shields constructed from polycarbonate material provide the best impact and heat resistance of all visor materials. Polycarbonate also provides chemical splash protection and holds up well in extremely cold temperatures.

NOTE: Face shields constructed of wire mesh are only applicable in protecting workers against larger debris. Ensure a proper hazard assessment is completed prior to choosing any face shield. A mesh face shield is never acceptable involving work activities requiring a Class 6 face shield.

8.3 Fire-retardant Clothing

In some instances, “arc rated” fire-retardant clothing may be required. Contractors must determine that need and ensure personnel are equipped with such clothing before arriving on site. Once the facility is connected to the power system, fire-retardant clothing is mandatory for working on the isolated lines or equipment. The minimum arc thermal protective value of 8 is required for clothing worn inside energized substations or right-of-ways with energized lines.

8.4 Safety Footwear

Safety boots must:

- Meet CSA standard Z195: Protective Footwear (have the CSA green triangle symbol).
- Have the Omega symbol, which indicates they are rated to 18,000 V when new. This protection decreases with condition and time.



Note: Based on the written Hazard Assessment for the work being performed, metatarsal guards are required when using equipment such as jumping jack styled compactors.

8.5 Anti-slip Footwear

Appropriate anti-slip footwear, in good working condition, is required based on the hazard assessment of the task and to suit ground conditions (e.g., winter conditions) when it adds to the worker's safety. Workers must assess ice slipping hazards before work begins and throughout the day if conditions change. If workers are unable to remove the hazard with the site controls, additional traction devices must be added to the footwear to increase grip and the anti-slip effectiveness of the footwear.

Care must be exercised when wearing anti-slip footwear indoors or on metal surfaces. Anti-slip footwear with metal studs or spikes may become very slippery in metal-to-metal conditions.

When selecting anti-slip footwear or when adding traction devices to existing footwear, ensure the electrical shock resistant rating of the footwear is not lessened. For example, footwear with steel studs screwed into the sole of the boot must not be used when working on power line right-of-ways or substations that are energized. Additional traction devices with steel studs that attach to the sole of boot, but do not penetrate into the sole of the boot are acceptable.

8.6 Head Protection

All safety headwear is compliant with the CSA Z94.1 or ANSI Z89.1 Standard.

Head Protection identified as Class E, Type 1 with crown impact is required on all jobsites where the potential for lateral contact to a worker's head exists.

Mechanics working for AltaLink are permitted to wear bump caps for their job duties.

8.7 Hand Protection

Glove usage is required when performing tasks at any AltaLink work site.

- The level of glove required is job dependant; personal preference is considered, as long as the gloves meet the minimum requirements for the job being performed.
- Those attending site visits must have gloves readily available and on the person.
- Wear gloves that are appropriate for the task and according to the hazard to be protected against.

These include but not limited to:

- Impacts, cuts, and abrasions.
- Extreme temperatures.
- Chemical, toxic, biological, corrosive and other hazardous substances.

If your hazard assessment determines that cut resistant gloves must be worn, the minimum rating level for gloves is a cutting resistance of Level 3.

8.8 Respiratory Protective Equipment

Contractors must have a respiratory code of practice in place that meets or exceeds the requirements of Part 18 of the *Alberta Occupational Health and Safety Code*.

8.9 Jewelry, Hair and Loose Clothing Requirements

Contractors must have a program in place that addresses worker safety when working around machinery and equipment with moving parts as outlined in Part 25 of the *Alberta Occupational Health and Safety Code*. If contact between moving parts of machinery, electrically energized equipment or part of the work process and a worker's clothing, jewelry or hair is likely, a worker must:

- Wear clothing that fits close to the body and does not have any loose or dangling strings or zipper pulls.
- Not wear bracelets, rings, dangling neckwear, a wristwatch or similar articles.
- Have head or facial hair that is short or confined and cannot be snagged or caught.

8.10 Noise / Hearing Requirements

Contractors must implement a noise and hearing management program that meets or exceeds Part 16 of the *Alberta Occupational Health and Safety Code*.

Contractors must ensure hearing protection is worn when 85dB is encountered at the worksite.

9 WORKING AT HEIGHTS

9.1 Fall Protection

Contractors shall establish a fall protection program that meets or exceeds Part 9 of the *Alberta Occupational Health and Safety Code*.

All workers who work at heights are required to use fall protection equipment and must attend fall protection training and demonstrate competency in using the equipment.

A fall protection plan must be developed if a fall of greater than 3 metres vertical distance or where applicable excavations are present, if there is an unusual possibility of injury, and the worker is not protected by guardrails. The plan must specify:

- The fall hazards at the site.
- The fall protection system that is used.
- The anchors to be used.
- The clearance distances below the work area must be confirmed to prevent a worker striking the ground or objects or levels below the work area.
- A procedure to assemble, maintain, inspect, use and disassemble fall protection systems as applicable.
- Rescue procedures to be implemented in the event of a fall where a worker is suspended and needs rescue.

The fall protection plan must be available at the work site and be reviewed by all workers prior to any work at heights beginning. The plan must be updated whenever conditions affecting fall protection change.

Rescue procedures must be developed and be available at the work site, along with the appropriate rescue equipment outlined in these procedures. A minimum of two appropriately trained workers must be readily available to perform rescue duties if needed.

9.2 Drop Zones

- When tasks are being performed from heights, the hazard assessment must address “dropped objects” and adequate mitigations must be in place before proceeding. Workers must create a physically visible safe control zone below those working at heights using flagging, ribbon or pylons and/ or have a designed safety watch. All work above needs to stop when workers below need to enter the safe work zone.
- Establish good communication between ground and heights. Using two way radios could be an effective communication tool to ensure workers at heights and workers on the ground can communicate to each other.
- When it is necessary for workers on the ground to be below workers who are moving into position to work or who are working at heights, ensure all work above is stopped and all tools and materials are secured.
- Tie off tools and materials with a small piece of non-conductive material (rope) or a rated sling attached to both the tools or materials and the work area.
- All equipment and materials must be raised and lowered in a controlled manner and not dropped into the control zone.
- Send tool bags on a handline to workers working at heights when a work position has been established and then the hoisted bags can be secured in position so they cannot be accidentally turned upside down.
- Use tool pouches with covers to prevent tools from falling out. Once workers are in position, work can be performed using tied off tools.
- Ensure no tools or materials are left unsecured when at heights. Ensure workers inspect their tool holders (frogs, nose bags) daily prior to climbing at heights and replace them when damaged or worn out.
- Workers who are working at heights but are immediately below others working above are also at risk. Care must be taken to ensure all tools and materials above are secured before work commences below.

9.3 Telecom Towers

Telecom tower rigging companies are required to have a process and documented checklist for guyed tower pre-climb work. Anchors and guy wires must be inspected prior to climbing telecom towers.

9.4 Use of Conductor Carts

Conductor cart use is not permitted when the following conditions apply:

- Execution of a workable rescue plan is not possible.
- On an overhead shield wire.
- On a single-conductor configuration smaller than 795 Drake.

- On a single-conductor configuration, 795 Drake or larger, where there is damage or a splice within the span to be worked on, without permission from AltaLink engineering.
- On bundled conductor sizes smaller than 397.5 MCM ACSR 26/7.
- Total weight of the cart, tools, equipment and worker exceed 400 kgs.

Contractors need to have their own procedure to operate conductor carts. Planning, hazard assessment, checking and documenting adjacent spans, training requirements, maintenance requirements, risk of hardware failure/ vertical personnel or equipment, rescue planning, brake design concerns, and incline or decline on the line.

If a damaged conductor is found during inspection, contact AltaLink Engineering to verify the conductor is safe to use for the conductor cart activity.

9.5 Flight Operations

Contractors are required to follow the following health and safety standards related to helicopter work listed below:

- *Aerial Patrol Standard ALS-2079*
- *Aerial Worker Transportation Standard ALS-2081*
- *Helicopter Material and Tool Transportation Standard ALS-2078*
 - *Helicopter Material and Tool Transportation and Work Acceptance Form ALS-2078F*
 - *Helicopter Material and Tool Transportation Checklist ALS-2078F1*
- *Helicopter Human Cargo Standard ALS-2080*
 - *Helicopter Human Cargo Acceptance Form ALS-2080F*

The *Aerial Patrol Standard ALS-2079* includes information for various types of patrols including scheduled, emergency, detailed, and data acquisition air patrols.

The *Aerial Worker Transportation Standard ALS-2081* include information on the transportation of workers in a helicopter. This may include transporting workers to remote sites, high level inspections, environmental surveys, and transporting engineering or management personnel for post storm/ events.

The *Helicopter Material and Tool Transportation Standard ALS-2078* includes long lining and stringing work activities. This would include longlining tools, equipment and materials to sites via helicopter. Stringing is pulling in a conductor or pilot line with a helicopter. There is an associated form (*Helicopter Material and Tool Transportation and Work Acceptance Form ALS-2078F*) required to obtain AltaLink Management approval for this type of work activity. The checklist is a resource to help manage the tools and materials that are transported in and out of the worksite and ensure load securement.

The *Helicopter Human Cargo Standard ALS-2080* covers helicopter platform work and entries and exits to or from structures. There is an associated form (*Human Cargo Acceptance Form ALS-2080F*) required to obtain AltaLink Management approval for this type of work activity.

All contractors using aircraft to perform work are expected to have a flight operations safety management program which includes the elements outlined in this section.

9.5.1 Flight Planning and Scheduling

All flights (including UAVs, fixed wing, and helicopter) over existing or proposed facilities require flight planning and scheduling as per the AltaLink standard *ALS-2058 - Flight Planning and Scheduling*.

9.5.2 Unmanned Aerial Vehicle (UAV) Operators

In order to fly a UAV, contractors are required to have basic training authorized by Transport Canada. If contractors are required to fly in “controlled air space” advanced training is also required. This process is subject to change and contractors must meet current training and operation requirements.

9.5.3 Helicopter Operations

9.5.3.1 Pre-qualification

Contractors intending to use helicopters to perform work for AltaLink needs to pre-qualify the helicopter company. In addition to traditional pre-qualification elements (e.g., WCB, proof of insurance, certificate of incorporation), the contractor is required a set criteria for current regulatory aviation audits from helicopter companies they intend to use on AltaLink projects. The audit results help to gain a perspective on the functionality of the helicopter company (as pertaining to the working relationship with the contractor), its workers, and abilities to function safely in the wire environment. As a minimum, the audit scope needs to address the following elements:

- Flight operations, pilot experience, and training records
- Transportation of dangerous goods
- Flight and maintenance operations
- Safety management systems

Audit results must not identify major discrepancies that contravene Alberta OH&S, *the Canadian Aviation Regulations* (if noted), the company Operations manuals, nor company Standard Operating Procedures. Any corrected audit findings must be satisfactory to the contractor. All operations are required to comply with the *Canadian Aviation Regulations* (CARS).

9.5.3.2 Training, Competencies and Minimum Hours

Refer to the AltaLink standards listed above for specific information on required pilot training, experience and minimum number of hours to perform the work.

9.5.3.3 Restricted Helicopter Zone

Please refer to *Aerial Worker Transportation Standard ALS-2081* for information on this topic.

9.5.4 Crew Safety Protocols and Operations

Please refer to the helicopter standards listed above for information on flight operations, crew safety protocols, PPE, procedures and documentation.

Contractors must define crew safety protocols for pre-flight, in-flight and post-flight operations along with minimum crew complements that meets or exceeds UFOC (Helicopter Association Canada) guidelines.

9.5.5 Hazard Assessment and Safe Work Planning

Please refer to the helicopter standards listed above for information regarding aircraft selection, flight timing, safe zones, minimum helicopter approach distance requirements, helicopter electrical safety, helicopter fueling, load securement, and safeguards required (weather, environment).

Contractors are required to document their hazard assessment and mitigations, procedure and JSA/ Safe work plan. This documentation may require approval from AltaLink depending on the type of work being performed. Communication protocols are highlighted in the specific helicopter standards.

9.5.5.1 Inspections

The contractors are required to have a defined process for site inspections to ensure compliance to standards and policies with intervals dependent upon the length of the project and scope of work. These inspections may be in the form of focus audits, worksite inspections, and review of documents, etc.

10 SAFE WORK PRACTICES

10.1 Housekeeping

- Good housekeeping is a basic requirement on all construction areas and must be maintained at all times.
- Special attention is given to maintaining clear walkways and roadways, removing trash, removing slipping and tripping hazards and ensuring proper storage of material.
- Trash containers and / or garbage cans are available in the various work areas.
- Remove all protruding nails, screws, staples, or other objects that present a hazard to employees or vehicles.
- Hoses, cables and cords need to be elevated over walkways and landings. All hoses, cords, and cables are neatly coiled and hung on appropriated designed hangers off the ground. Only that hose, cord or cable needed for the required job is placed on the ground. Excess hose, cord or cable found on the ground are removed from the work area.
- Fire extinguishers must remain accessible and ready for use at all times.

10.2 Human Performance Flagging

Human performance errors contribute to the frequency of incidents occurring when working on AltaLink sites. Flagging equipment is a method or tool to visually identify safety and reliability hazards in order to reduce or eliminate the frequency personal incidents of this nature occur. Contractors are required to source their own work zone kits to flag equipment. Flagging is only one method used to improve human performance. Barriers or engineered solutions may also be used.

There are different type of human performance tools for example:

- Administrative such as work procedures or FLHAs
- Engineered equipment – LOTO, interlock systems,
- Physical controls - barricades, hotstick hand guards (nylon, rubber)
- Visual controls – flagging, signage, drop zones, cones or markers

Some of the work activities that require human performance initiatives to be applied are:

- Working on protection packages during maintenance activities
- Switching activities
- Installing new equipment within the control building
- Trouble shooting of equipment that may have failed
- Helicopter work activities

Information regarding flagging AltaLink equipment and work zone kits is available in the *HPI Flagging Procedure ALF-ALL-1999*. Contractors can use the procedure with your teams, or you can create your own procedure. The HPI Flagging Procedure is available on the Contractor Safety website.

Human performance measures are being integrated throughout AltaLink operations. Contractors need to consider opportunities to integrate into their operation and work procedures

10.3 Use of Spotter

When the operation of vehicles or equipment has the potential to make inadvertent contact with people, materials, facilities, vehicles or equipment (i.e., has the potential to cause injury or damage due to its movement), a spotter must be used. Some examples of when spotters are required:

- The driver/ operator does not have a clear view of the intended path of travel due to blind spots, travelling in reverse, or other obstructions.
- There is limited visibility or space.
- Maneuvering large vehicles or equipment through gates, or into/out of buildings or structures.
- Backing or maneuvering vehicles pulling trailers.
- Operating in busy areas, or when traffic is present.
- Physical hazards are present. Including visible and hidden hazards such as in tall grass, or snow.
- Operating near structures and buildings.
- Operating around people.
- *Operating near energized lines and equipment.

*Additional requirements for spotter use are identified in section 10.10.4 Operating Equipment Near Energized Facilities.

Contractors performing work for AltaLink are required to have a spotter program (including training) which includes the following elements:

- When a spotter is required
- General spotter requirements and spotter responsibilities
- Operator responsibilities
- Hazard assessment and control
- Communication methods (including hand signals)
- Blind spot identification
- Spotter positioning

When it is identified that a spotter is required, all personnel involved in the work (e.g., operator, spotter, and other affected crew members) must perform a hazard assessment to identify what could potentially be contacted and how it will be avoided.

- Spotters shall not perform any other tasks while acting as spotter.
- The driver or equipment operator will not move the vehicle or equipment without clear direction by the spotter.
- The driver or equipment operator shall immediately stop if visual contact is lost, or if a spotter's instruction or signal is unclear.
- The driver or equipment operator shall observe a stop signal from anyone in the vicinity.
- The spotter shall never move out of the driver's line of sight without first stopping the vehicle or equipment.

10.4 Confined Space Entry

Contractors entering confined spaces shall develop a code of practice that meets or exceeds Part 5 of the *Alberta Occupational Health and Safety Code*. These procedures must be in writing, available to workers and for inspection as required.

10.5 Ground Disturbance

All ground disturbance activities are required to follow all governing laws and regulations and industry best practices to safely execute the work. Follow Alberta OH&S requirements.

Contractor must ensure that "One Call or One Click" and locates are completed prior to any ground disturbance activities.

10.6 Excavations and Trenching

Contractors are responsible to establish a program that protects workers and protects existing facilities that could be affected by excavating or trenching operations. The program must meet or exceed Part 32 of the *Alberta Occupational Health and Safety Code*.

Contractors must ensure all excavations, trenches and openings are properly fenced, barricaded or covered according to regulations, and access is controlled to sites where excavations or openings are left unattended. Appropriate notices must be posted warning of the potential danger.

10.6.1 Excavations and Trenching within a Substation

Any excavations within a substation which expose the ground grid within an energized substation must meet the requirements of *ALS-1405 - Working around Exposed Ground Grids in an Energized Substation*. Workers entering the excavation for any duration must be protected by a mitigation method outlined in Part 7 of the standard.

10.7 Equipment Access and Egress

Contractors must ensure they have three point contact requirements in place and traction/ grips aids are available when accessing or egressing equipment.

10.8 Propane Standards

- All propane equipment shall be used according to manufacturer recommendations and local applicable regulations.
- Propane tanks are to be physically barricaded. Pylons and ribbons, etc. are not sufficient.
- All contractors must ensure that pre-use inspections are carried out on all cylinders, valves, fittings, and hoses.
- All propane cylinders transported on site must be secured in an upright position during transportation.
- All propane cylinders shall be securely stored in an outdoor location when not in use.
- These cylinders, once fully discharged, are to be gathered at storage locations.
- Propane torches shall not be used for heating hoardings or any other enclosure.

10.9 Right-of-Way and Roadside

Contractors must have a program in place that provides an approved written plan relating to traffic control during roadside work activities. This plan must comply with all local laws or requirements agreed to in crossing or road use agreements.

Contractors must ensure all requirements of any crossing or road use agreements are met.

Workers working in a public road right-of-way or otherwise exposed to traffic must be provided with and instructed to wear required PPE with reflective or highly visible material. PPE must meet minimum requirements for AltaLink PPE worksites. Contractors are required to have received the proper level of training to do such work for all AltaLink worksites.

Workers must ensure they do not cause unnecessary hazards or impediments to the general motoring public. All applicable rules of the road must be adhered to when entering or leaving a work site, and vehicles must be pulled as far off roadways as possible. Workers shall not gather on any roadway where public traffic is present.

Barricades, cones, flashers and warning signs must be placed at strategic locations when working on or near roads and other areas where vehicular traffic may be a hazard. Signs must be staged within the applicable distances of the road use agreement, and promptly removed when no longer required.

10.10 Power Lines and High Voltage Work Areas

10.10.1 Live Work

All work that falls within the definition of “live work”, as defined with the Terms and Definitions section of *ALS-2030: Live Work Standard* is deemed to be safety critical and requires additional due diligence to safely execute and the expectations within the standard must be followed. AltaLink is required to approve all “live work.” Before live work is performed, the *ALS-2030F: Live Work Acceptance Form* must be completed. Refer to AltaLink safety standard:

- *ALS-2030: Live Work Standard*
- *ALS-2030F1: Live Work Acceptance Form*

10.10.2 Significant Electrical Hazard Work

Some work activities are classified as “significant electrical hazard work.” These work activities include, but not limited to:

- Working directly above energized conductors.
- Working directly above an energized bus in a substation.
- Working on a line above energized underbuild on the same structure.
- Repairing or replacing guy wires above energized conductors.
- Working on a structure with energized transmission underground risers (i.e., connecting underground transmission line to overhead transmission line).
- Excavating or working within minimum approach distances of energized underground transmission cables.

The criteria for managing significant electrical hazard work follows the process described in the Live Work Standard. Refer to AltaLink safety standard:

- *ALS-2030: Live Work Standard*
- *ALS-2030F1: Live Work Acceptance Form*

10.10.3 Increased Electrical Hazard Work

Some work activities are classified as “increased electrical hazard work.” These work activities include:

- Stringing in a high induction corridor.
- Stringing over an energized conductor or energized equipment.
- Structure modifications or adjustments that have potential for the pole, structure or conductor to fail, move unexpectedly and come into contact with people or the ground.
- Working on a line that crosses over an energized line (in the same span).
- Climbing structures (i.e., towers or poles) past energized conductors while maintaining MAD from energized phases.
- Working on double circuit structures with one circuit energized.

Prior to performing increased electrical hazard work, contractors are required to:

- Create a thorough hazard assessment and subsequent safe work plan (or procedure) with a minimum of the following elements:
- Method(s) to ensure minimum approach distances are maintained by all personnel, tools, materials, rigging, and equipment.
- Method(s) to ensure safe drop zones are created and maintained.
- Applicable secondary safeguard(s) required to ensure tools, materials, and equipment do not contact energized equipment in the event of a mechanical failure (e.g. rider poles).
- Recloser blocks (necessary for most activities identified).
- Ensure all involved personnel are trained in the plan/procedure and are competent to perform their assigned tasks.
- Include an internal process whereas the hazard assessment, safe work plans/procedures, and crew compliment are reviewed, accepted, and endorsed by a senior leader in the organization.

10.10.4 Operating Equipment Near Energized Facilities

When possible, facilities should be de-energized when travelling below or working nearby with equipment that has the ability to reach within the limits of approach.

It is imperative that controls such as:

- isolating and grounding equipment where limits of approach or min approach distances cannot be maintained,
- obtaining a reclose block, maintaining MAD or LOA and having a dedicated safety watch, are used where equipment is not able to be de-energized.

The contractor must have a system in place to adequately manage the hazards of operating equipment near energized facilities. The system must contain the following elements:

- A means to determine the voltage and subsequent limit of approach (LOA). If the voltage is unknown, the limit of approach is seven metres.
- Positive methods of control to ensure the limits of approach are not breached. Examples are:
 - Signage, flagging – HPI Tool
 - Goalposts
 - Spotter(s)
- A method to communicate the hazards and subsequent controls to all involved in the work area.
- Training to ensure all involved personnel know what to do in the event of contact to avoid injury due to step/touch potential.

When a spotter is used, they must not be assigned any other tasks. The spotter must understand the hazards and the controls, and must have an audible means of contact with the equipment operator (e.g., radio communication, air horn).

Examples of acceptable means of control are:

- Equipment with boom (e.g., crane, trackhoe, backhoe) crossing below an energized power line.
 - Signage, flagging – HPI Tool
 - Goalposts
 - Hazard assessment and controls understood by all involved.
- Equipment with boom (e.g., crane, trackhoe, backhoe) working near an energized power line.
 - Signage, flagging – HPI Tool
 - Spotter
 - Hazard assessment and controls understood by all involved.
- Equipment without a boom (e.g., dump truck, tractor-trailer) travelling below an energized power line.
 - Signage, flagging – HPI Tool
 - Hazard assessment and controls (e.g., assurance that all implements are lowered before approaching line) understood by all involved.

10.10.5 Isolation and Grounding

Contractors must ensure any work performed inside an energized substation or any work involving transmission line conductors (on a power line right-of-way) that a project safe work plan and project grounding plan are created. The hazards of energization and energization due to induction must be mitigated to protect workers and be in alignment with the following standards:

- *ALS-818: Facility Isolations*, which describes the isolation of energy when the work is under the control of the AltaLink Control Center.
- *ALS-2074: AltaLink EBG Standard*, outlines the requirements for EBG and the application of portable protective grounds when working on isolated AltaLink facilities for the purposes of construction, maintenance, operation and emergency repair.
- *AL-ALL-90001: Working on Isolated Transmission Facilities* outlines the technical requirements associated with working on isolated and grounded power lines. This is an engineering standard available on the Contractor Engineering website. Access to this website can be obtained by contacting AltaLink.
- *ALS-1991: AltaLink – FortisAlberta Substation Interconnection Standard*, which defines specific procedures to safely install and connect FortisAlberta underground distribution power cables to AltaLink substations by clarifying operating authorities, work practices and procedures.
- *ALS-2007: AltaLink Application Requirements of Temporary Protective Grounds*. Excerpt from Engineering standard AL-ALL-20001. This standard provides information on the sizing required for temporary protective grounds for substations and lines and substation exception list.

10.10.6 Substation Exception List

The Grounding Exception Tables standard is an excerpt taken from AltaLink engineering standard AL-ALL-20001 and is a list of substations where grounding practices other than the use of a single 2/0 TPG assembly are required. Refer to AltaLink safety standard:

- *ALS-2007: AltaLink Application Requirements of Temporary Protective Grounds*

10.11 Minimum Approach Distances (MAD) and Limit of Approach Distances (LOA)

The limits of approach with reference to in the *AEUC Division E Limits of Approach* must be maintained by:

- General Public or non-utility workers; see table 6
- Utility employees working in a substation; see table 7
- Qualified utility employees working in a substation; table 8
- Utility tree trimmers; table 9
- Tree to Energized Electrical Equipment or Lines Distances for Utility Tree Trimmers, Utility Tree Workers, and Other Workers; table 10
- Tree to Energized Electrical Equipment or Lines Distances for Utility Tree Trimmers Using Rated Insulated Tools; table 11
- Limits of approach distances for qualified utility employees performing live line work using rubber gloves; table 12

AltaLink engineering standard “Minimum Approach Distance Calculations for Transmission Lines AL-LIN-20004”, MAD must be maintained when working on transmission lines only by:

- General Public, Low/Medium Voltage Workers and Utility Arborists working on transmission lines table 13.
- Certified Competent Employees Working or Climbing on Energized Structures table 14.
 - MAD when reclosers are enabled
 - MAD when reclosers are blocked
 - MAD for barehand work
 - MAD for helicopter work MHAD

10.11.1 Minimum Approach Distances For HVDC

The minimum approach distances are under review by AltaLink Engineering.

For line connected to the HVDC facility:

- Pole 3.22 meters
- Dedicated Metallic Return (DMR) 1.0 meters

For stations at the HVDC:

- Pole 3.15meters
- DMR 1.05 meters

Table 6: Safe Limits of Approach Distances from Overhead Power Lines - General Public or Non-utility Workers

Operating Voltage of overhead power line conductors unless otherwise specified	Safe limit of approach distance for people and equipment
0 – 750 V insulated or polyethylene covered conductors ¹	0.3 m
0 – 750 V bare, uninsulated	1.0 m
> 750 V insulated conductors ^{1,2}	1.0 m
-0.75- kV – 40 kV	3.0 m
69 kV, 72 kV	3.5 m
138 kV, 144 kV	4.0 m
230 kV, 260 kV	5.0 m
500 kV	7.0 m
500 kV DC Pole Ground	7.0 m
1. Conductors must be insulated or covered throughout their entire length to comply with these groups. 2. Conductors must be manufactured to rated and tested insulation levels.	

Table 7: Limit of Approach Distance in Millimetres for Utility Employees Working in a Substation

Voltage Levels			Utility employees
Nominal voltage to ground (kV)	Nominal voltage phase to phase (kV)	Maximum operating voltage phase to phase (kV)	Limit of approach to exposed energized parts (mm)
Column 1	Column 2	Column 3	Column 4 ¹
0.6 (DC only)			800
0.3 – 2.4	0.6 – 4.16	4.58	800
8	13.8	15.18	850
14.4	25	27.5	950
19.9	34.5	37.95	1050
	69, 72	79.2	1350
	138, 144	158.4	1650
	230, 260	285	2150
	500	550	3450
1. Limit of approach distances in Column 4 have been calculated using IEEE minimum tool distances plus 750 mm safety factor, rounded to the nearest 50 mm.			

Table 8: Limit of Approach Distance in Millimetres for Qualified Utility Employees Working in a Substation

Voltage Levels			Qualified Utility Employees
Nominal voltage to ground (kV)	Nominal voltage phase to phase (kV)	Maximum operating voltage phase to phase (kV)	Limit of approach to exposed energized parts (mm)
Column 1	Column 2	Column 3	Column 4 ¹
0.6 (DC)			500
2.4	4.16	4.58	500
8	13.8	15.18	550
14.4	25	27.5	650
19.9	34.5	37.95	750
	69, 72	79.2	1050
	138, 144	158.4	1350
	230, 260	285	1850
	500	550	3150
1. Limit of approach distances in Column 4 have been calculated using IEEE minimum tool distances plus 450 mm safety factor, rounded to the nearest 50 mm.			

Table 9: Limit of Approach Distance in Millimetres for Utility Tree Trimmers

Voltage Levels			Utility Tree Trimmers		
Nominal voltage to ground (kV)	Nominal voltage to phase (kV)	Maximum operating voltage to phase (kV)	Limit of approach for tree trimmers and conducting objects to exposed energized parts (mm)	Limit of approach for rated insulating tools to exposed energized parts (mm)	Limit of approach for rated insulating booms (mm)
Column 1	Column 2	Column 3	Column 4 ¹	Column 5 ²	Column 6 ³
0.6(DC)			1050	40	500
2.4	4.16	4.58	1050	40	500
8	13.8	15.18	1100	120	550
14.4	25	27.5	1200	210	650
19.9	34.5	37.95	1300	290	750
	69, 72	79.2	1600	610	1050
	138, 144	158.4	1900	920	1350
	230, 260	285	2400	1410	1850
	500	550	3700	2710	3150
<ol style="list-style-type: none"> 1. Limit of approach distances in Column 4 have been calculated using IEEE minimum tool distances plus 1000 mm safety factor, rounded to the nearest 50 mm. 2. Limit of approach distances in Column 5 have been calculated using IEEE minimum tool distances, rounded to the nearest 10 mm. 3. The column does not apply to utility or qualified utility employees doing tree work near energized electrical equipment or lines. 					

Note: Column 4 must have recloser block.

Table 10: Tree to Energized Electrical Equipment or Lines Distances in Millimetres for Utility Tree Trimmers, Utility Tree Workers, and Other Workers

Voltage Levels			Utility tree trimmers, utility tree workers & other workers
Nominal voltage to ground (kV)	Nominal voltage phase to phase (kV)	Maximum operating voltage phase to phase (kV)	Tree to energized electrical equipment or lines distance for slashing and brushing (mm)
Column 1	Column 2	Column 3	Column 4 ¹
0.6 (DC only)			800
2.4	4.16	4.58	800
8	13.8	15.18	850
14.4	25	27.5	950
19.9	34.5	37.95	1050
	69, 72	79.2	1350
	138, 144	158.4	1650
	230, 260	285	2150
	500	550	3450
<p>1. Tree to energized electrical equipment or line distances in Column 4 have been calculated using IEEE tool distances plus 750 mm safety factor, rounded to the nearest 50 mm.</p>			

Table 11: Tree to Energized Electrical Equipment or Lines Distances in Millimetres for Utility Tree Trimmers Using Rated Insulated Tools

Voltage			Utility tree trimmers	
Nominal voltage to ground (kV)	Nominal voltage phase to phase (kV)	Maximum operating voltage phase to phase (kV)	Tree to energized electrical equipment or lines using rated insulating tools (mm)	Tree to energized electrical equipment or lines using rated insulating aerial device (mm)
Column 1	Column 2	Column 3	Column 4 ¹	Column 5 ²
0.6 DC			350	Not touching
2.4	4.16	4.58	350	Not touching
8	13.8	15.18	400	Not touching
14.4	25	27.5	500	Not touching
19.9	34.5	37.95	600	Not touching
	69, 72	79.2	900	600
	138, 144	158.4	1200	900
	230, 260	285	1700	1400
	500	550	3000	2700
<ol style="list-style-type: none"> 1. Tree to energized equipment or line distances in Column 4 have been calculated using IEEE tool distances plus 300 mm safety factor, rounded to the nearest 50 mm. 2. Tree to energized electrical equipment or line distances in Column 5 for 69 kV lines and higher have been calculated using IEEE tool distances rounded to the nearest 50 mm. 				

Table 12: Limit of approach distance in millimeters for qualified utility employees performing live work using rubber gloves

Voltage levels			Qualified utility employees	
Nominal voltage to ground (kV)	Nominal voltage phase to phase (kV)	Maximum operating voltage phase to phase (kV)	Limit of approach for work performed from a rated insulated device	
			Unprotected body parts to exposed work (mm)	Unprotected body parts to exposed adjacent phases, structure surfaces or ground parts (mm)
Column 1	Column 2	Column 3	Column 4 ⁽¹⁾	Column 5 ⁽²⁾
2.4	4.16	4.58	40 ⁽³⁾	500
8.0	13.8	15.18	120	550
14.4	25.0	27.5	210	650
19.9	34.5	37.95	290	750
	69, 72	79.2	Note (4)	Note (4)
	138, 144	158.4	Note (4)	Note (4)
	230, 260	285	Note (4)	Note (4)
	500	550	Note (4)	Note (4)

(1) Limit of approach distances in Column 4 have been calculated using IEEE minimum tool distances rounded to the nearest 10 mm.

(2) Limit of approach distances in Column 5 have been calculated using IEEE minimum tool distances plus 450 mm safety factor, rounded to the nearest 50 mm.

(3) Work performed directly from a pole or structure on electrical equipment or lines operating at voltages below 5 kV between conductors must be done in accordance with Rule 4-142.

(4) Live line work using rubber gloves is not normally done at these voltage levels. Rubber insulating equipment may be required to handle **isolated** and grounded lines that normally operate at these voltage levels.

Table 13: AltaLink’s Minimum Approach Distances for General Public, Low/Medium Voltage Workers and Utility Arborists

Column 1	Column 2	Column 3	Column 4	Column 5
Voltage Class Line-to-Line (kV)	Max Voltage (kV)	Public No Training	Low voltage (<750V) electrical and other workers all meeting ALTALINK’s Safety Certification Process – minimum 1 year experience working in High Voltage Environment Other Utilities working near but NOT on ALTALINK Transmission Line Facilities	Electrical with 2 years experience in medium or high voltage (>750V) or Line apprentice having successfully completed 2nd year
			Competency assessment signed off by manager	Competency assessment signed off by manager
			Phase-Ground MAD	Phase-Ground MAD
500	550	7000	5350	4750
240	264	5000	3600	3000
138	152.4	4000	2400	1800
69	75.9	3500	1850	1250
25	27.5	3000	1650	1050
13.8	15.2	3000	1600	1000
4.16	4.58	3000	1550	950

Notes:

- Approach distances are based on standard atmospheric conditions. Standard atmospheric conditions are defined as temperatures above freezing, wind less than 24 km per hour, unsaturated air, normal barometer, uncontaminated air, and clean and dry insulators. If standard atmospheric conditions do not exist, extra care must be taken. [1]
- Distances are based on altitudes below 1500 m.
- MAID – Minimum Air Insulation Distance – bare minimum distance required to withstand the maximum electrical stress experienced by the gap.
- MAD – Minimum Approach Distance – MAID plus an ergonomic factor which is dictated by level of training.
- Column 3 – is taken from the AEUC Table 2-1.
- Column 4 – Transmission: (MAID reclose enabled + 1200 mm); Distribution: (MAID reclose enabled + 1500 mm) – **RECLOSE ENABLED**
- Column 5 – Transmission: (MAID recloses enabled + 600 mm); Distribution: (MAID reclose enabled + 900 mm) – **RECLOSE ENABLED**

Table 14: AltaLink’s Minimum Approach Distances for Certified Competent Employees Working or Climbing on Energized Structures

Column 1	Column 2	Column 3	Column 4	Column 5		Column 6	
Voltage Class Line-to-Line (kV)	Max Voltage (kV)	ALTALINK Certified Competent JM Line worker or an apprentice line worker under the direction of the Competent JM climbing on structure (reclose enabled)	ALTALINK Certified and Competent JM Line worker or an apprentice line worker under the direction of the Competent JM (reclose blocked)	ALTALINK Certified Competent JM Line worker trained to perform Live Line Work or an apprentice line worker under the direction of the Competent JM trained in live work (reclose blocked) Line-to-Line MAD are for barehand work procedures		ALTALINK MHAD for Certified & Competent JM Line Worker and trained and competent pilot under the direction of competent JM Line Worker (reclose blocked)	
		Phase-Ground	Phase-Ground	Phase-Ground	Phase-Phase	Phase-Ground	Phase-Phase
500	550	4600	3700	3550	5050	3950	5600
240	264	2850	2200	2050	2650	2300	2950
138	152.4	1650	1450	1300	1600	1450	1800
69	75.9	1100	1100	950	1100	1050	1250
25	27.5	900	900	950	1100		
13.8	15.2	850	850	950	1100		
4.16	4.58	800	800	950	1100		

Notes:

- Approach distances are based on standard atmospheric conditions. Standard atmospheric conditions are defined as temperatures above freezing, wind less than 24 kilometres per hour, unsaturated air, normal barometer, uncontaminated air, and clean and dry insulators. If standard atmospheric conditions do not exist, extra care must be taken. [1]
- Distances are based on altitudes below 1500 m.
- MAID – Minimum Air Insulation Distance – bare minimum distance required to withstand the maximum electrical stress experienced by the gap.
- MAD – Minimum Approach Distance – MAID plus an ergonomic factor which is dictated by level of training.
- Column 3 – For voltages ≥69 kV IEC 61472-2004 + 450 mm ergonomic distance was used with overvoltage values of: 69 kV- 4 pu, 138 kV – 3.5 pu, 240 kV – 3.5 pu, 500 kV – 2.5 pu. Voltages <69 kV are based on IEEE 516-2009+ 750 mm ergonomic distance with overvoltage value of 4 pu. – RECLOSE ENABLED
- Column 4 – For voltages ≥69 kV IEC 61472-2004 + 450 mm ergonomic distance was used with overvoltage values of: 69 kV- 4pu, 138 kV – 3 pu, 240 kV – 2.75 pu, 500 kV – 2.1pu. Voltages <69 kV are based on IEEE 516-2009+ 750 mm ergonomic distance with overvoltage value of 4 pu. – RECLOSE BLOCKED
- Column 5 – For voltages ≥69 kV IEC 61472-2004 + 300 mm ergonomic distance was used with overvoltage values of: 69 kV- 4 pu, 138 kV – 3 pu, 240 kV – 2.75 pu, 500 kV – 2.1pu. Voltages <69 kV are based on IEEE 516-2009+ 450 mm ergonomic distance with overvoltage value of 4 pu. – RECLOSE BLOCKED

8. Column 6 – For voltages ≥ 69 kV – Column 5 + 10% to account for rotor wash, corona on helicopter and movement due to wind. 10% is an industry suggested value from IEEE 516-2009. Voltages < 69 kV - helicopter work is not normally done at these voltage levels. – RECLOSE BLOCKED

10.12 Low Voltage Work

AltaLink's *Low Voltage Safety Standard ALS-2047* outlines requirements for workplace electrical safety necessary for the practical safeguarding of workers working on or in proximity to low voltage energized electrical equipment. It aims to protect workers from the hazards of electric shock and arc flash and complements AltaLink engineering standard *AL-STN-61003: AC Low Voltage Arc Flash Hazard Analysis*, which provides for facility design that controls arc flash hazards through engineering solutions.

While AltaLink aims to reduce arc flash hazards to Level 2 or below (< 8 cal cm^2), this may not always be feasible. System changes can impact arc flash hazard levels and unless these are recognized and mitigated, may increase hazards to workers. The practices outlined the *Low Voltage Safety Standard* are to be followed whenever low voltage work is being performed.

The *Low Voltage Safety Standard* impacts all workers (AltaLink employees and contractors) who repair, maintain, or install equipment in proximity to low voltage apparatus and equipment and is in effect at all AltaLink facilities where low voltage ($< 750\text{V}$) equipment exists. This standard applies to both AC and DC low voltage work. Refer to AltaLink safety standard:

- *ALS-2047: Low Voltage Safety Standard*

10.13 Fencing and Barricades

Contractors must ensure that, where applicable, facility access is controlled by ensuring gates are closed and locked at all times or a suitable watch is provided to prevent unauthorized access. If animals are in the vicinity, the gate must be kept closed. Be sure to consider the emergency evacuation requirements when gates are required to be locked when crews are onsite.

Contractors must ensure that all excavations, trenches and openings are properly fenced, barricaded or covered according to regulations, and access is controlled to sites where excavations or openings are left unattended and notices are posted warning of the potential danger.

10.14 Radiation Producing Equipment

- Contractors are required to have a program that protects the worker from radiation as per Part 20 in the *Alberta Occupational Health and Safety Code* when working with equipment that exposes workers to a radiation hazard. Any area which may be affected by radiation requires radiation warning devices and signs containing the internationally recognized symbol for radiation placed around the perimeter. This includes lasers (Class 3b and Class 4 lasers) that meet the Alberta OH&S requirements.
- When radiographic equipment is used, contractors must ensure the area is clear and all personnel are a safe distance from the radiation source.

- A contractor needs to ensure that no worker operates designated radiation equipment unless a registration certificate has been issued by an authorized radiation health registration agency or by a Director for that equipment. A copy of the certificate is posted near the equipment if possible or communicate to the workers using the equipment the terms and conditions of the certificate.
- Only properly trained, qualified personnel are allowed to use radiation-producing equipment or materials at company facilities. Contractors are required to maintain records of all training and qualifications regarding radiation equipment. Only properly trained and qualified persons are allowed entrance to these restricted areas.

10.15 Rigging Including Chains, Slings and Cables

Contractors must ensure:

- All chains, slings and cables are applicable for the job and are maintained according to the manufacturer's requirements.
- All chains, slings and cables must have an identification tag attached indicating the load rating, last tested date and limitations. Never exceed the assigned load rating for chains/slings/cables.
- Daily inspections are conducted before use to look for wear, abrasions, collapse and other visible damage.
- Defective or damaged chains, slings, cables or components are removed from service immediately. Hooks, rings, links or any coupling devices must have the same or higher rating as the chain to which it is affixed. Never use makeshift links or coupling devices.
- Rigging fixtures such as spreader bars and crosses must bear name plates clearly stating capacities for tension, compression and transverse loads (as applicable). A copy of the rigging fixture drawing stating technical specification, certified by a professional engineer, must be available on site when the fixture is in use.
- Any tool, sling, shackle, etc. used for towing or recovery must be visually marked and only used for towing or recovery.

10.16 Handling and Use of Explosive Materials (Implosive Sleeves)

The use of implosive connectors from IMPLO (Burndy) is suspended until further notice and requires further investigation. (AltaLink Engineering Technical bulletin AL-ALL-0068-TB, 2016/09/07)

10.17 Mechanical Equipment and Motorized Vehicles

For all machinery and specialized equipment used on the project by the contractor, the contractor must ensure:

- It is of sufficient size, strength and design and made of suitable materials to withstand stresses imposed on it during operation, and it can perform the function for which it is intended or designed.

- The rated capacity or other limitations on the operation of the equipment, or any part of it as described in the manufacturer's specifications or specifications certified by a professional engineer, are not exceeded.
- Modifications to equipment that may affect its structural integrity or stability are performed in accordance with the manufacturer's specifications or specifications certified by a professional engineer.
- Equipment and supplies are erected, installed, assembled, started, operated, handled, stored, serviced, tested, adjusted, calibrated, maintained, repaired and dismantled in accordance with the manufacturer's specifications or the specifications certified by a professional engineer.

All licensed vehicles are required to be road worthy and meet or exceed the conditions of the Highway Traffic Act. Contractors need to ensure all vehicles in general service have the first aid equipment that meets the requirement of *Alberta Occupational Health and Safety Code, Schedule 2*; and a fire extinguisher with current inspection records that meets the minimum rating of 2A-10BC (for moveable equipment) as per *Alberta Safety Codes Act Fire Code Regulation*.

10.18 Contractor Owned Fabricated Equipment

All contractor owned, fabricated or modified machinery and equipment used by the contractor must be used, operated, tested, adjusted, calibrated, maintained, repaired and dismantled in accordance with specifications certified by a professional engineer. The certification must be in writing, must be stamped and signed by a professional engineer and a legible copy available on site when the equipment is present.

10.19 Defective Power Tool Tag Out

Contractors must have a program in place to prevent a possible injury if a defective power tool is on an AltaLink site. It must be tagged out of service so the tool is not accidentally used.

10.20 Defective Mobile Equipment Tag Out

Contractors must have a program in place to prevent a possible injury if a piece of defective mobile equipment is on an AltaLink site. It must be tagged out of service so the equipment is not accidentally used.

10.21 Cranes and Lifting Operations

All cranes, hoists and lifting gear equipment must be operated, tested and maintained in accordance with the manufacturers' specifications or those of a professional engineer and Part 6: Cranes, Hoists, and Lifting Devices of the *Alberta Occupational Health and Safety Code* (and standards identified therein).

Cranes and hoists must have, inside the cab, copies of:

- Crane capacity chart identifying the crane model, manufacturer, and identification number.
- Crane operator manual.

- Current issued certificates of inspection for all hoisting equipment that will be used for lifts.

10.21.1 Standard and Critical Lifts

Two categories of lifts are as follows:

1. Standard lift – means any load hoisted where the lift process:
 - Is low risk from start to completion of the lift.
 - Uses a single crane and does not exceed 75% of its lifting capacity
2. Critical Lift - The critical lift includes all the criteria in a standard lift plus the following additional criteria:
 - A critical lift is initiated if the load exceeds 75% of the chart capacity.
 - A tandem two crane lift or if the work site manager declares the lift a critical lift.
 - A lift study for lifts over 75% of the cranes capacity is required.
 - For a critical lift greater than 75% of the chart capacity a qualified/competent lift supervisor must approve the lift plan, rigging equipment and hoisting equipment to be used.
 - The lift endangers existing facilities, the operating workplace or the public.
 - The mobile crane is required to be operated so that no part of the crane or load enters the minimum approach distances or limits of approach from electrical power lines, except where a qualified utility employee trained and competent in Live Work uses the crane with attachments that are designed to lift energized conductors.”
 - If any part of the crane, hoist line or load is capable of encroaching upon minimum approach distance or limits of approach, a competent signal person is required at all times within view of the operator.”

10.22 Suspended Personnel Platforms

This section in the document refers to the use of a manufactured personnel platform that is hoisted on the load line of a crane. This does not include bucket trucks or traditional aerial work platforms.

All cranes, personnel baskets, and lifting gear must be operated, tested, and maintained in accordance with the manufacturers’ specifications or those of a professional engineer and Part 6: Cranes, Hoists, and Lifting Devices of the *Alberta Occupational Health and Safety Code* (and standards identified therein). Other requirements include:

- Before using any suspended personnel platform, contractors must determine if an alternative means of reaching the work-site location is available.
- Cranes used to hoist personnel must be equipped with a load monitoring device and an anti 2-block device.
- When using a suspended personnel platform, the crane must not exceed 50% for all components at working radius.
- Suspended personnel platforms are not to be used as elevating devices for convenience or be used for lifting or hoisting materials or tools

Contractors must develop a procedure for the use of suspended personnel platforms that must include but is not limited to:

- Risk assessment for the scope of work.
- Personnel lift plan, which must include lift calculations.
- Pre-lift meeting checklist.
- Test-lift the basket for:
 - Secondary support using test weights at 125% of rated platform capacity (unoccupied).
 - Primary support using test weights at 125% of rated platform capacity which includes a radius check (unoccupied).
 - Primary support 30 cm off the ground for final check of all connections and rigging (occupied).

10.23 Chainsaws

Contractors are required to have a chainsaw program in place prior to commencement of work. The program includes verification of training, an operator skills competency evaluation, a safe work plan review with hazard identification, PPE, transportation/storage and maintenance plan.

Personal protective equipment standard requirements for chain saw use:

- **Eye Protection:** Safety glasses with side shields, safety goggles and face shields approved by CAN/CSA Standard Z94.3: Eye and Face Protectors or ANSI Standard Z87.1-2010: Occupational and Educational Personal Eye and Face Protection Devices. Note: A face shield attached to the hard hat without safety glasses does not provide the adequate eye protection.
- **Head protection:** A hard hat approved by CSA Standard Z94.1: Industrial Protective Headwear – Performance, Selection, Care and Use or ANSI Standard Z89.1 Industrial Head Protection.
- **Hearing protection:** CSA Z94.2 Standard: Hearing Protection Devices, Class A or equivalent approved protection.
- **Leg protection:** Le Bureau de normalization du Quebec (CAN/BNQ) 1923-450 Category A or equivalent or better protection such as Workers' Compensation Board of B.C. (WCB) PPE 1 - 1997. Protective chainsaw pants or chaps that cover from crotch to ankle in front and cover the lower leg, "calf regions" completely must be worn. When fire resistant clothing is required, leg protection is to be worn as the outside layer.
- **Hand protection:** Leather, Kevlar or ballistic nylon gloves.
- **Foot/ankle protection:** Boots meeting CAN/CSA-Z195: Protective Footwear or ANSI Standard Z41: Personal Protection – Protective Footwear or equivalent (**Note:** *footwear must cover the ankle and provide ankle support*).

Requirements for Lines Crew for Chainsaw Use

When lines crews are working from a bucket and using the chainsaw, a chainsaw protective jacket is required. Adequate storage is needed for a chainsaw while working in the bucket. This includes equipment such as a holster or suspending the chainsaw using other manufactured equipment outside the bucket.

10.24 Fire Prevention and Fire Fighting Equipment

Contractors must follow the requirements in *Fire Risk Work Site Prevention and Mitigation Standard (ALS-2068)* when planning and executing work on AltaLink right-of-ways or infrastructure.

Contractors are responsible for prevention planning, response and control of any fires resulting from the work activities.

Contractors must maintain, at the work site(s), sufficient portable firefighting equipment in good working order and execute best efforts to extinguish any fire caused by work activities in the area.

10.25 Asbestos

Based on the period of their construction, some AltaLink facilities have been identified as containing (or having the potential to contain) asbestos in its construction materials. Facilities with known or suspected asbestos are listed in *ALS-2057: Asbestos Release Standard and Procedure* which is an internal standard located on the contractor website in the *AltaLink Reference Safety Standards* section. Contractors must ensure the requirements of the *Alberta Asbestos Abatement Manual (2012)* are followed where any type of work is done where asbestos containing products may be disturbed, including submission of *Notice of Project* forms within the prescribed timeframes prior to any work beginning.

If work is to occur in a facility that has the potential to disturb asbestos, the AltaLink project manager is required to follow the identification and abatement process outlined in ALS-2057 before the work is to proceed.

If it is suspected that asbestos containing products are inadvertently disturbed, the person-in-charge of the work shall:

- Isolate the area immediately.
- Report the incident to their reporting manager or designate.
- Report the incident to the AltaLink project manager.
- Minimize any further disturbance.
- Flag off the area to prevent others from entering if suspected asbestos may be airborne.

Work is not to proceed until an assessment (and abatement if required) is completed and the area is deemed safe to re-enter.

10.26 Cutting Tool Selection and Use

Contractors must have a program to provide guidance on the proper selection, use, and maintenance of cutting tools (e.g., knives, cable strippers, etc.) and the appropriate cut resistant gloves to be used. At a minimum, the program must include the following elements:

- A process to determine if a cutting tool must be used to perform the task or if the requirement for a cutting tool can be practically eliminated.
- A process to determine if a cutting/shearing tool (e.g., wire cutters, cable skinner) can be used to perform the task instead of a knife.

- A process to determine what type of hand protection (i.e., cut resistant) must be worn to use the cutting tool.
- A determination of the key tasks performed by the organization that requires cutting tools and a determination of what cutting tool and hand protection will be used.
- Guidelines for maintaining and storing tools.

Box cutters or retractable knives are not to be used to strip or cut cables. When it is not suitable to use jacket skinners or wire strippers, a cable skinning knife with a fixed blade is required.

Knives with segmented blades (i.e., breakaway knife blades) are not to be used on AltaLink worksites.

When cut resistant gloves are required, a minimum of level 3 cut resistant gloves must be used.

10.27 Off-road Vehicle Use

Contractors must follow AltaLink's *Off-Road Vehicle Standard* ALS-2060. Contractors must also have a program in place that meets or exceeds this standard for the safe use of off-road vehicles when accessing areas where there are no roads and minimal support services. The program must ensure there are measures in place to minimize impacts in sensitive environmental areas and addresses the hazards related to off-road vehicles and controls in place to mitigate these hazards.

10.28 Power Mobile Equipment

Contractors must have a program in place for the safe use and operation of powered mobile equipment. Workers must be authorized to use and be properly trained and qualified to operate the equipment.

10.29 HVDC Converter Stations: Auxiliary Systems

The HVDC converter stations have a variety of auxiliary equipment not under the direction and control of the ACC. There are unique sources of energy at the HVDC sites not typically found at the other substations. This requires lock-out and tag-out (LOTO) procedures to be in place to manage the control of hazardous energy for these systems. The HVDC facilities are also equipped with Kirk Key safety interlocking systems and Bay Control Units, which have interlocking bypass capabilities. HVDC operation technologists can issue auxiliary locks to auxiliary workers or contractors who do not have their own personal locks when they are working on auxiliary equipment.

If you are completing auxiliary work at one of the HVDC substations, you must follow:

- *ALS-2086: Lock Out Tag Out Standard*

Note: specific areas may have procedures specific to equipment isolation.

10.30 Hantavirus Hazards

The following risks are associated with Hantavirus:

- Humans can contract Hantavirus when there is contact with deer mice or other rodents nest areas, droppings, body fluids, and surrounding dusts or soils harboring Hantavirus.

- Hantavirus Pulmonary Syndrome (HPS) produces a flu-like illness starting with fever, sore muscles, headaches, nausea, vomiting, a shortage of breath and progressing to a fatal disease in 50% of cases.
- Symptoms may appear from five to forty five days after exposure to the virus.

Contractors must have a program in place that identifies the hazards, reduces the risks of workers being in contact with Hantavirus, and provides a safe procedure for clean-up.

10.31 Critical Tools

Contractors are required to have their own procedure(s) for defining, identifying, purchasing and the management of critical tools to ensure a safe and consistent approach with the applicable codes and standards. The procedure(s) also needs to include inspection, certification, testing, repair, maintenance and record keeping of critical tools.

11 FACILITY SECURITY

Contractors must ensure that, where practicable, facility access is controlled by ensuring gates are closed and locked at all times or a suitable watch is provided to prevent unauthorized access. If animals are in the vicinity, the gate must be kept closed. If continuous access is required, the gate must be secured to prevent damage and must be closed and pinned as a minimum during periods of inactivity. Additionally:

Clean Site Requirements (AL-STN-90010-Rev2 – Section 4.2)

- Remove targets of theft/vandalism from the site. This includes removal of any non-essential spare equipment and ensuring adequate security for project related work.
- Operations
 - Storage of any non-site specific spare material/equipment is not permitted on site. Examples of site specific spares are GIL bushings, fuses, etc.
 - Any site specific consumables shall not be stored outdoors.
 - In buildings with windows, avoid placing any spares/consumables in view.
 - Storage of copper wire/material is not permitted.
- Projects
 - Construction shacks are not permitted inside the substation.
 - No project consumables (e.g. Copper wire, connectors, fuel, etc.), trailers, or vehicles are to be stored inside the substation during non-working hours.
 - Following project completion no spare/extra material shall be left on site beyond any site specific spares.

Copper Clad Steel (AL-STN-31000-Rev2 - Section 7.2.1)

- Due to copper theft concerns, copper clad steel (CCS), shall be used as above grade bonding conductors for any new substation designs and bonding repair (replacement) for existing substations. The CCS bonding conductor shall be connected to the grounding loop that extends above the insulating gravel

12 HEALTH & SAFETY MEETINGS

Contractors must ensure that, as a minimum, monthly scheduled safety meetings are completed with all personnel.

13 FORMAL INSPECTIONS AND AUDITING

Contractor supervisors or foreman, health and safety representatives are required to perform a daily tour of their work site(s) with a focus on the health and safety aspects of worker activities and site conditions. Brief, written records of the observations are recorded with the date, the activity or condition and any corrective actions identified or implemented.

13.1 Additional Safety Reporting

The additional safety reporting is required for project work with the following personnel on site (see also Section 2.14):

- 1 to 10 Contractor employees and/or subcontracted workers on site – Every two weeks, a brief summary report outlining safety observations as well as any action items must be submitted to the AltaLink Project Manager or their designate.
- 11 to 25 Contractor employees and/or subcontracted workers on site – Once per week a summary of safety observations and any action items is to be submitted to the AltaLink Project Manager or their designate.
- 26 to 100 Contractor employees and their subcontracted workers on site – Once per week a summary of safety observations and any action items is to be submitted to the AltaLink Project Manager or their designate.
- 101 to 200 Contractor employees and/or subcontracted workers on site – Once per week a summary of safety observations as well as any action items is to be submitted to the AltaLink Project Manager or their designate.

13.2 Health and Safety Management System Audit

AltaLink reserves the right to perform formal health and safety audit(s) of contractor work activities. The scope of these audits cover compliance with the agreed health and safety management plans, policies, procedures, practices and with the governing laws and regulations.

14 CONTRACTOR ENVIRONMENTAL REQUIREMENTS

AltaLink's commitment to managing environmental performance is demonstrated throughout the organization – from the *Environmental RESPECT Policy* to the environmental standards, procedures and requirements used to direct and execute work activities.

Figure 1 demonstrates our commitment.

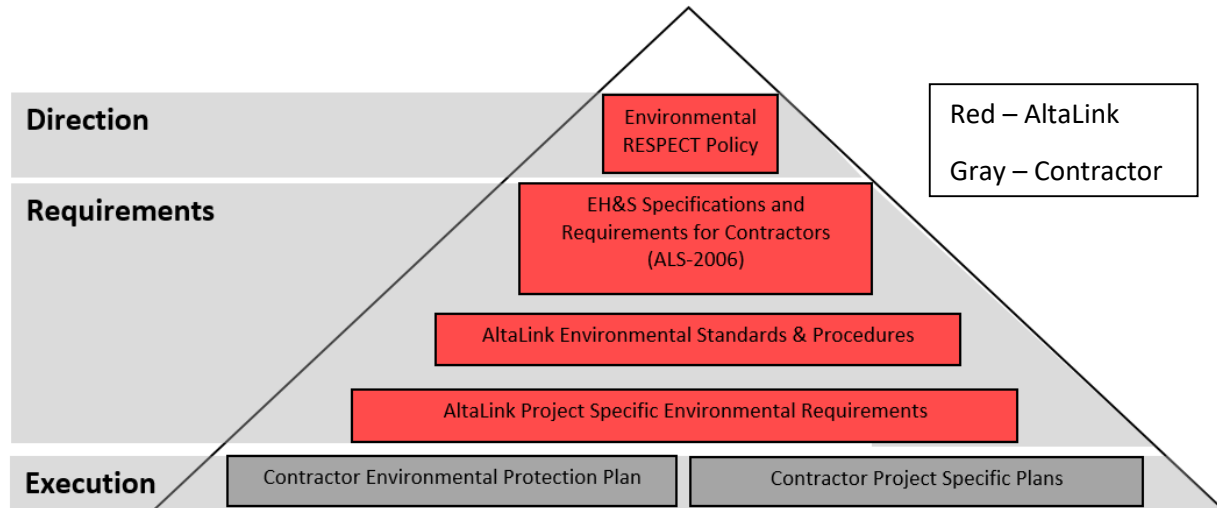


Figure 1 – Environmental Commitment

The purpose of this section is to provide an overview of AltaLink’s general and *Project Specific Environmental Requirements (AL-ENV-6015)* for contractors.

14.1 AltaLink’s Environmental RESPECT Policy

Contractor environmental performance is critical in ensuring AltaLink meets its commitment to protect the environment. All contractors have the responsibility to be knowledgeable about AltaLink’s Environmental RESPECT policy. Contractors must be responsible and accountable for understanding and incorporating environmental requirements into their daily work activities. AltaLink’s Environmental RESPECT policy can be viewed on AltaLink’s website (www.Altalink.ca) and the Contractor Safety Site.

14.2 Legal and Other Requirements

It is the contractor’s responsibility to know, understand and comply with all applicable federal, provincial, and municipal environmental laws, regulations, approvals or permits, and requirements related to the scope of work.

AltaLink’s environmental standards identify the applicable legal and other requirements that apply to the construction and operation of AltaLink’s electrical infrastructure. Environmental standards apply to both employees and contractors.

14.3 Competence and Awareness

Contractors must be technically competent to perform their work and understand applicable environmental requirements, responsibilities and industry best practices. Contractors must also ensure that subcontractors understand their environmental responsibilities and are competent to perform their work.

14.4 Environmental Incidents

All environmental incidents and near misses must be reported to AltaLink and investigated as outlined in Section 3: *Incident Management*.

14.5 Project Specific Environmental Requirements

AltaLink may provide contractors with *Project Specific Environmental Requirements* in the tender documents. The *Project Specific Environmental Requirements* will:

- Provide project specific permits, approvals, authorizations, notifications.
- Provide project specific commitment, and mitigations.
- Identify the Project Specific Plan(s) the contractor is required to have a qualified environmental professional develop, sign, and submit to AltaLink Environment before commencement of work activities (See section 14.6.1).
- Identify records that must be returned to AltaLink.

AltaLink will revise the *Project Specific Environmental Requirements* based on additional requirements from regulators, receipt of new approvals, notifications, or authorizations, and additional project specific environmental assessments. Revisions will be communicated with the contractor within 45 days.

14.6 Contractor Environmental Protection Plan Requirements

AltaLink requires all contractors develop, an *Environmental Protection Plan* specific to the work they complete for AltaLink. The *Environmental Protection Plan* must:

- Acknowledge and describe how the requirements within *AltaLink's Environmental RESPECT Policy* will be incorporated into work activities.
- Acknowledge and indicate how the work activities will comply with legal and other requirements.
- Acknowledge that all environmental incidents will be reported and investigated in accordance with the requirements in Section 3: *Incident Management*.
- Acknowledge the project specific environmental requirements, including the environmental project screening report, will be implemented as provided by AltaLink.
- Acknowledge that all project specific plans will be prepared by a qualified environmental professional and submitted to AltaLink Environment before commencement of work activities.
- Acknowledge that all records will be provided to AltaLink upon completion of the project.
- Acknowledge that each AltaLink environmental standard and procedure will be incorporated into work activities or identify if not applicable.

Contractors participating in the Supplier Performance Management program are required to review and re-submit their *Environmental Protection Plan* each calendar year, prior to January 31.

14.6.1 Project Specific Plans

Contractors are required to develop Project Specific Plans based on the AltaLink provided *Project Specific Environmental Requirements*. These plans must be developed and signed by a qualified environmental professional before commencement of the work activity.

14.7 Records

The contractor must submit all required records to the AltaLink environmental advisor upon completion of the project, or as requested by AltaLink.

14.8 Environmental Monitoring and Inspections

Contractors may be required to develop an environmental monitoring plan as identified in the *Project Specific Environmental Requirements*.

AltaLink Environment will conduct periodic inspections to monitor conformance with AltaLink requirements and compliance with legal and other requirements. The outcome of the inspection will be distributed to both the contractor and AltaLink leadership. Contractors are required to address any corrective actions specified, in the inspection report.

14.9 Environmental Standards and Procedures

The following section outlines AltaLink's environmental standards and procedures. Environmental standards apply to all AltaLink employees and contractors. Some environmental procedures may only apply to AltaLink employees; however, as indicated in the following sections, they have been provided to contractors for reference.

There may be additional applicable vegetation management or engineering standards that contain environment content as detailed in the project tender documents and/or design based memorandum.

14.9.1 Greenhouse Gases (SF₆, CF₄, RF10A, R22)

AltaLink uses several greenhouses gases in both electrical equipment (SF₆ and CF₄) and the operation and maintenance of HVAC systems (RF10A and R22). Due to the high global warming potential of these gases, all necessary measures and precautions must be taken to prevent releases. There may also be safety concerns with exposure to these gases and /or their residue.

All SF₆ cylinders used for pressurizing new equipment must be returned to the manufacturer or gas supplier. AltaLink requires confirmation that cylinders have been returned. Refer to:

- AL-ENV-6002: *SF₆ Gas Reporting Procedure (for reference)*
- ALF-STN-1025: *SF₆ Gas Handling Procedure (for reference)*
- ALF-STN-1025F1: *Emissions from In-Service Equipment (for reference)*
- ALF-STN-1025F2: *Emissions from Decommissions and Failed Equipment (for reference)*

14.9.2 Wildlife

Contractors shall be aware of the potential impacts their activities may have on wildlife or wildlife habitat. Depending on the location and timing of work activity, consultation may be required with AltaLink environment. Refer to:

- AL-ENV-6005: *Wildlife Standard*
- AL-ENV-6006: *Wildlife Procedure*
- AL-ENV-6006F1: *Nesting Behaviour Search Data Sheet*
- ALS-2009F5: *Wildlife Mortality or Injury Report Form*

14.9.3 Oil Filled Equipment & PCB Management

Contractors who handle insulating oil or in-service oil filled equipment must take necessary measures and precautions to prevent releasing any PCB oil into the environment. There are specific requirements for the maintenance, storage, transportation, recycling and disposal of PCB contaminated electrical equipment, equipment components and oil. Refer to:

- AL-ENV-2003: *PCB Contaminated Electrical Equipment Handling Standard*
- ALF-STN-1015: *PCB Contaminated Oil and Equipment Handling Procedure*

14.9.4 Soil Handling

Contractors are required to follow AltaLink's requirements for the handling, on site re-use, and offsite disposal of soils. Refer to:

- AL-ENV-6011: *Soil Handling Standard and Procedure*
- AL-ENV-6011F1: *Soil Management Plan Template*

14.9.5 AL-ENV-6011F1: Soil Management Plan Template Clubroot

Clubroot is a soil-borne disease that infects the root system of plants in the Brassicaceae family (e.g. canola). Clubroot can be spread by the introduction of the diseases from an infested area through improperly cleaned vehicles and equipment. Contractors are required to understand how to prevent the transfer of the disease. Refer to:

- AL-ENV-2000: *Clubroot Standard*
- AL-ENV-2001: *Clubroot Procedure*
- AL-ENV-2001F1: *Recommended Questions for Land Managers Owners Occupants*
- AL-ENV-2001F2: *Cleaning Logs*

14.9.6 Temporary Access

Temporary access associated with construction and operations activities can negatively affect soil and vegetation. AltaLink has specific criteria in which temporary access or work activities must be modified or suspended. Refer to:

- AL-ENV-6007: *Temporary Access Standard*
- AL-ENV-6008: *Temporary Access Procedure (for reference)*

14.9.7 Work in and Around Water Bodies

Contractors shall ensure all applicable notifications, approvals, authorization, and mitigation plans are in place and adhered to prior to commencing activities in and around water bodies. Refer to:

- AL-ENV-6003: *Work in and Around Water Standard*
- AL-ENV-6004: *Work in and Around Water Procedure*

14.9.8 Historical Resources

AltaLink is required to secure a *Historical Resources Act* approval prior to the start of work activities. Contractors are required to understand their requirements with the *Historical Resources Act* and comply with applicable approval conditions. Refer to:

- AL-ENV-6016: *Historical Resources Standard*

14.9.9 Waste and Recyclables Management

Contractors are required to appropriately manage all waste and recyclable materials on their work sites. All contractors who generate waste or recyclables are required to develop a Waste and Recyclables Management Plan which identifies the anticipated waste and recyclables streams, authorized waste vendor and receiving facility. Contractors are also required to report on the wastes and recyclables generated from the Project. Refer to:

- AL-ENV-6009: *Waste Standard and Procedure*
- AL-ENV-6009F1: *Waste and Recyclables Management Plan*
- AL-ENV-6009F2: *Waste Reporting Form*

14.9.1 Spill Prevention and Response

Contractors, who manage, handle, store or transport oil, fuel or other hazardous materials are required to develop a Spill Prevention and Response Plan, appropriate to their work activities. The Spill Prevention and Response Plan must describe appropriate spill prevention and response procedures so environmental emergencies are addressed in accordance with applicable legislation and best management practices to facilitate a safe, quick, and effective response and thus, minimize adverse effects to terrestrial and aquatic environments. Refer to:

- AL-ENV-6001: *Spill Prevention and Response Requirements Standard*
- AL-ENV-6001F1: *Spill Prevention and Response Plan*
- ALS-2009F6: *Spill Report Form*

14.9.2 Reclamation

Land disturbed by construction, operation and maintenance of AltaLink infrastructure must be reclaimed to mitigate potential future adverse effects, comply with regulatory requirements, and maintain positive relations with stakeholders. Contractors must understand AltaLink's requirements for planning, implementing, and monitoring reclamation and incorporate these requirements into their work plans. Refer to:

- AL-ENV-6013: *Reclamation Standard*
- AL-ENV-6014: *Post-Construction Reclamation Procedure*

- AL-ENV-6014F1: *Reclamation Documentation*

15 REFERENCES

The following documents are references within this standard and they are located on AltaLink's Contractor Safety website. To gain access to the Contractor Safety website, send a request to healthandsafetyadministrator@altalink.ca.

Document Number	Document Name	Department
ALS-2026	Alcohol and Drug Standard for Contractors	Safety
ALS-1081	AltaLink Corporate Health and Safety Policy	Safety
ALS-1717	AltaLink Safety Certification Standard and associated forms ALS-1717F1 to ALS-1717F14	Safety
ALS-1942	AltaLink Standard for Obtaining Switching, GOI and Grounding and Recloser Blocks Certifications	Safety
ALS-1942F	Obtaining Switching, GOI and Grounding and Recloser Blocks Certifications Forms (ALS-1942F1 – ALS-1942F10)	Safety
ALS-2012	Prime Contractor Standard	Safety
ALS-818	AltaLink Facility Isolation	Safety
ALS-2030 and ALS-2030F	Live Work Standard and Live Work Acceptance Form	Safety
ALS-1991	AltaLink-Fortis Substation Interconnection Standard	Safety
ALS-2007	AltaLink Application Requirements of Temporary Protective Grounds	Safety
ALS-1994	Field Reliability Work Practices Standard	Safety
ALS-2058	Flight Planning and Scheduling	Safety
ALS-2058F1	Flight Note Request Form	Safety
ALS-2017	Low Voltage Safety Standard	Safety
ALS-2062	STARS Vigilant Site ID for Permanent Sites Standard	Safety
	AltaLink Environmental RESPECT Policy	Environment
ALF-STN-1025	SF ₆ Gas Handling Procedure	Field Operations
ALF-STN-1025F1	Emissions from In-service Equipment	Field Operations
ALF-STN-1025F2	Emissions from Decommissions and Failed Equipment	Field Operations
AL-ENV-6002	SF ₆ Gas Reporting Procedure	Environment
AL-ENV-2003	PCB Oil Filled Equipment Handling Standard	Environment
ALF-STN-1015	Contaminated Oil and Equipment Handling Procedure	Field Operations
AL-ENV-2000	Clubroot Standard	Environment
AL-ENV-2001	Clubroot Procedure	Environment
AL-ENV-2001F1	Recommended Questions for Land Managers Owners Occupants	Environment
AL-ENV-2001F2	Cleaning Logs	Environment

ALS-2009F5	Wildlife Morality or Injury Report Form	Environment
ALS-2009F6	Spill Report Form	Environment
AL-ENV-6001	Spill Prevention and Response Standard	Environment
AL-ENV-6001F1	Spill Prevention and Response Plan	Environment
AL-ENV-6003	Work in and Around Water Standard	Environment
AL-ENV-6004	Work in and Around Water Procedure	Environment
AL-ENV-6005	Wildlife Standard	Environment
AL-ENV-6006	Wildlife Procedure	Environment
AL-ENV-6006F1	Nesting Behaviour Search Data Sheet	Environment
AL-ENV-6007	Temporary Access Standard	Environment
AL-ENV-6008	Temporary Access Procedure	Environment
AL-ENV-6009	Waste Standard and Procedure	Environment
AL-ENV-6009F1	Waste and Recyclables Management Plan	Environment
AL-ENV-6009F2	Waste Reporting Form	Environment
AL-ENV-6011	Soil Handling Standard and Procedure	Environment
AL-ENV-6011F1	Soil Management Plan Template	Environment
AL-ENV-6013	Reclamation Standard	Environment
AL-ENV-6014	Post-Construction Reclamation Procedure	Environment
AL-ENV-6014F1	Reclamation Documentation	Environment
AL-ENV-6016	Historical Resources Standard	Environment
ALS-2086	Lockout and Tagout Standard	Safety
ALS-2079	Aerial Patrol Standard	Safety
ALS-2081	Aerial Worker Transportation Standard	Safety
ALS-2078	Helicopter Material and Tool Transportation Standard	Safety
ALS-2088 and ALS-2088F	Helicopter Human Cargo and Helicopter Human Cargo Acceptance Form	Safety
ALS-2078F	Helicopter Material and Tool Transportation and Work Acceptance Form	Safety
ALS-2078F1	Helicopter Material and Tool Transportation Checklist	Safety
ALS-2068	Fire Risk Work Site Prevention and Mitigation Standard	Safety
ALS-2084	Helicopter Flight Log	Safety
ALS-2074	Equipotential Bonding & Grounding Standard	Safety

16 TERMS AND DEFINITIONS

Construction Authorization – Is a project manager issued authorization, enabling construction work to begin. All construction work performed on the project occurs under the construction authorization. At the completion of the project the construction authorization is returned back to the project manager.

Construction Manager – Is the construction authority for new, electrically isolated, facilities or additions to existing functional facilities.

Construction Isolation Issued by the construction manager. It defines all components of the new facility that must remain isolated from all other electrical components of the system (lines, substations, generation). Isolation points must be physically isolated by an open span or open jumper and not open switchable switch.

Contractor – Unless otherwise specified, refers to both contractors and sub-contractors.

First Aid Incident – An occupational injury/ illness that requires first aid treatment only and does not result in loss of time from work. First aid injuries include:

- a) Use of non-prescription medications at a non-prescription strength, including antiseptics;
- b) Administration of tetanus or diphtheria shot(s) or booster(s). Other immunizations such as Hepatitis B or rabies vaccine related to an injury are considered medical treatment;
- c) Cleaning, flushing or soaking wounds on skin surface;
- d) Use of wound coverings such as bandages including liquid bandages, gauze pads, steristrips or butterfly bandages, etc. Wound closing devices such as staples, sutures and skin glue are considered medical treatment;
- e) Use of any hot/cold therapy (e.g., compresses, soaking, whirlpools, non-prescription skin creams/ lotions for local relief, etc.);
- f) Use of any totally non-rigid, non-immobilization means of support (e.g., elastic bandages, wraps);
- g) Use of temporary immobilization devices while transporting an accident victim;
- h) Use of eye patches;
- i) Removal of foreign bodies not embedded in the eye if only irrigation or removal with a cotton swab is required;
- j) Removal of splinters or foreign material from areas other than eyes by irrigation, tweezers, cotton swabs or other simple means;
- k) Use of finger guards;
- l) Use of massages;
- m) Drinking of fluids for relief of heat stress; and
- n) Preserving warmth for relief of cold stress.

Ground Disturbance – Any work or activity that results in a disturbance of the earth, including excavating, digging, trenching, plowing, drilling, tunneling, auguring, backfilling, blasting, topsoil stripping, land leveling, peat removing, quarrying, clearing and grading.

Guarantee of Isolation (GOI) – Is issued by the ACC operator to assure field staff that all "points of isolation" on a line or portion of the system have been opened, locked (where provision exists) and tagged. This gives the worker permission to test for potential on the equipment identified in the guarantee of isolation, install temporary protective grounds and issue a work permit. "Do not Operate" tags will be installed at all isolation points.

Medical Aid Incident – A classification of occupational injury/ illness for medical treatment beyond first aid injury where there have been no lost days. The following are not considered medical treatment injuries:

- a) Visit(s) to a health care provider limited to observation or counseling or prescribed restricted work;
- b) Diagnostic procedures (e.g., x-rays, blood tests), including the use of prescription medications solely for diagnostic purposes (e.g., eye drops to dilate pupils).

Near Miss Incident - An unplanned event that did not result in injury, illness, damage or environmental impact but had the potential to do so. A near miss incident has a release of energy that had the potential to cause a serious injury, incident, impact or loss.

Non-conformance - A performed activity that does not follow AltaLink standards, procedures, or project specific environmental requirements.

Non-compliance - A performed activity that does not fulfil the conditions of provincial or federal regulations, legislation, or approvals.

Occupational Injury/ Illness – Any injury/ illness that is not recorded as a fatality, lost-time injury, medical aid or restricted work incident but has been medically diagnosed and determined to be work-related and the cause is verified trauma or workplace exposure. Examples include punctured eardrums and fractured or cracked bones.

Person-in-charge – Meets the requirements of the Electrical Utilities Code, Part 40 of the *Alberta Occupational Health and Safety Code* and AltaLink designated standards. The person-in-charge is responsible to coordinate the site from a safety perspective. This entails authorizing others to perform work and issuing work permits to independent work groups if appropriately qualified. The person-in-charge must remain on site at all times or transfer the role to an appropriate individual if they must leave the site. The ACC must be notified of any transfer of person-in-charge (ACC operator or site entry/exit notification).

Qualified Environmental Professional: A scientist or technologist specializing in a relevant applied science or technology discipline including, but not limited to agronomy, forestry, biology, engineering, geomorphology, geology, hydrology or hydrogeology and registered in Alberta with an appropriate professional organization and who, through demonstrated suitable education, current experience, and detailed knowledge relevant to their particular discipline, may be reasonably relied upon to provide advice and develop plans within their area of expertise.

Restricted Work – When an employee, due to a work-related injury/illness, is medically determined to be unable to perform one or more routine functions or unable to work the normal time period of their pre-injury/illness work day, they are working in a “restricted” capacity.

Safety Meeting – General site safety meeting held at minimum monthly involving all workers and management on site.

Significant Near Miss – An unplanned event that had a high potential for a serious consequence and is classified as a class 2 near miss incident. The event could be a potential injury, damage or could affect reputation. A significant near miss incident can also include any spill/release as noted in Appendix 1- *AltaLink Release Reporting Requirements*.

Species-at-risk – Include threatened or endangered species as per the provincial Wildlife Act and federal Species at Risk Act.

Tailboard Meeting – A safety meeting held each day on the work site that covers work tasks of the day. It includes a review of the work plan with a discussion on the inherent hazards and the required safety mitigation. All workers involved in the tasks to be performed must be in attendance.

Undue Hazard - An “undue hazard” includes a hazard that poses a serious and immediate threat to the health and safety of a person.

Work Authorization– a generic term used in this document to include all types of authorizations and work permits that may be required for work on AltaLink functional facilities.

APPENDIX 1 – ALTALINK RELEASE REPORTING REQUIREMENTS

GENERAL ALTALINK RELEASE REPORTING REQUIREMENTS				
Product/Substance	Near Miss		Environmental Incident	
	Class 1	Class 2	Class 1	Class 2 (Regulatory Reportable)
Any product/substance that when released may cause, is causing or has caused an adverse effect to the environment				> Any amount
Any product/substance released to a surface water body (including a wetland or watercourse) or groundwater				> Any amount
PCBs:				
Electric insulating oil (PCB ≥ 2 ppm) in-service ¹	< 5 liters	≥ 0.75 gram PCB equivalent (cumulating)	≥ 5 liters	≥ 1 gram PCB equivalent (cumulating)
Electric insulating oil (PCB ≥ 2 ppm) not in-service ²				Any amount
Equipment and solids (PCB ≥ 50 ppm) not in-service ³				Any amount
Electrical insulating oil (PCB <2ppm)	< 5 liters		≥ 5 liters	≥ 200 liters ³
Flammable liquids (e.g. gasoline, diesel, Jet A/B)				
Hydraulic oil				
Herbicides				
Antifreeze				
Battery acid			> 0 liters	≥ 5 liters
Greenhouse gases (i.e., refrigerants, SF6, CF4)			< 10 kg or < sustained 10 minute release	≥ 10 kg or ≥ sustained 10 min release

¹ In-service (in-use) – Equipment and its associated products that are being processed daily and used for the purposes for which it was manufactured. This includes emergency back-up equipment located at AltaLink facilities.

² Not in-service (not in-use) – Equipment and products stored for future use, or equipment being stored pending disposal.

³ VP EH&S has final discretion over whether the release is having or could have an adverse effect to the environment, and therefore whether it is regulatory reportable or not.

RELEASE REPORTING REQUIREMENTS DURING THE TRANSPORTATION OF DANGEROUS GOODS				
Product/Substance	Near Miss		Environmental Incident	
	Class 1	Class 2	Class 1	Class 2 (Regulatory Reportable)
Any release or anticipated release that results in: the death of a person, the treatment of a person's injuries by a health care professional, an evacuation or shelter in place or the closure of a facility, road, main railway line.				> Any amount
Class 1, packing group II Explosives (e.g., detonators, charges)	Less than 5 litres		≥ 5 liters	Any quantity that endangers or could endanger public safety
Class 2 Gases (e.g. propane, SF ₆ , CF ₄)				
Class 3, packing group II Flammable liquids (e.g. gasoline)				
Class 6.1, packing group I or II Toxic substances (e.g. pesticides)				
Class 8, packing group I or II Corrosives (e.g. battery fluid)				
Class 3, packing group III Flammable liquids (e.g. diesel)	Less than 5 litres		≥ 5 liters	≥ 30 liters or kg, and the release endangers or could endanger public safety
Class 6.1, packing group III Toxic substances (e.g. pesticides)				
Class 8, packing group III Corrosives (e.g. electric storage batteries)				
Class 9 Miscellaneous (e.g. PCB ≥50 ppm)				