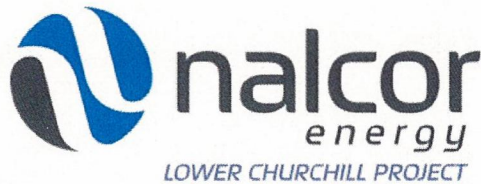


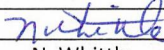
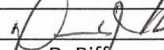

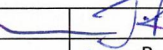

Nalcor Energy – Lower Churchill Project



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Comments:	Total # of Pages: (Including Cover): 163
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B5	29 July 2014	Re-Issued for Use	 N. Whittle	 D. Riffe	 D. Green	 R. Power
B4	21 Feb 2014	Issued for Use	Char Puddy	Dave Riffe	David Green	 Ron Power
B3	19-Jun-2013	Issued for Use	Dave Riffe	Jason Kean	David Green	Ron Power
B2	05-Oct-2012	Issued for Use				
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Status / Revision	Date	Reason for Issue	Prepared by	Functional Manager Approval	Quality Assurance Approval	Project Manager (Generation + Island Link) Approval

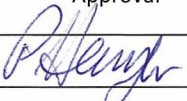
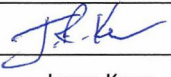
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Inter-Departmental / Discipline Approval (where required)

Department	Department Manager Approval	Date
	 Paul Harrington	25-July-2014
	 Jason Kean	25-JUL-2014

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1 EXECUTIVE SUMMARY

Nalcor Energy is committed to developing the Lower Churchill Project (LCP or the Project) with complete dedication to minimizing the risks of injury or ill health to personnel and damage to property or the environment as low as reasonably practicable. Nalcor Energy believes that Health and Safety Performance is fundamental to the achievement of project success, as well as its overall business and project objectives. It is therefore the Project Delivery Team's expectation and requirement that all personnel associated with the Project will play an integral role in the implementation of its Occupational Health and Strategy, performing at the highest possible levels and fostering continuous improvement in the areas of Health and Safety.

This Health and Safety Management Plan provides guidance on how the Lower Churchill Project scope of work can be safely executed. This Plan is focused for all levels of LCP management and specifically identifies the strategies and practices that Project personnel will employ to ensure that Health and Safety Performance Excellence is achieved. Individual responsibility and total commitment to a strong safety culture are well defined and established elements for achieving Incident and Injury free performances on the Project.

Nalcor believes that achieving its safety commitment of "Zero Harm - Nobody Gets Hurt" requires a proactive Health and Safety Management System, which is in place at the work-face level for all Contractors and Suppliers. The Health and Safety Management vision of the Lower Churchill Project is the ***"Relentless pursuit of an injury and illness free workplace where nobody gets hurt."*** Project excellence is not achievable without performance excellence in safety.

Eliminating all work related injuries, while effectively managing and executing the Project, is what ultimately defines us, as well as the overall success of the Project.

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Key Focus Areas:

Nalcor recognizes that the following focus areas of the Health and Safety Program are the key to the success of its Health and Safety effort. All Health and Safety Plans associated with the Project should include the following key focus areas and the intent of the initiatives:

- **Management Commitment:** Management must convince the workplace that safety is a core value by actively and visibly participating in the Health and Safety Effort and by providing adequate resources.
- **Workplace Participation:** All personnel must actively participate in the Health and Safety Effort to promote understanding, ownership and commitment.
- **Effective Communication:** Open and honest communication across all levels of personnel, supervision and management must be achieved. The safety process must reinforce and foster mutual feedback and respect.
- **Positive Reinforcement:** Positive reinforcement and constructive feedback must be promoted to ensure that desired worksite behaviours occur frequently.
- **Performance Measurement:** Leading indicators must be captured, analyzed and communicated to indicate how the workplace is proactively committed to the achievement of an injury/incident free working environment.
- **Caring about the Worker:** Focus must be placed on the worker as an individual. A work environment, which is safe and maintains a high level of employee morale and positive attitude must be created and maintained.
- **Empowerment:** Personnel must be empowered to immediately stop any unsafe behaviours or conditions that they find during the course of their work. Personnel must correct these unsafe behaviours or conditions as soon as practicable.

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- **Accountability**: All personnel must understand that each individual is responsible for his or her own safety. First line supervision must understand that they are accountable for the safety of their direct reports and that they must undertake the coaching role.
- **Competency**: All personnel must be fully competent to perform their daily work activities in a safe and productive manner.
- **Pro-activity**: A pro-active approach to the Health and Safety Effort must be emphasized and practiced. This will allow unsafe workplace behaviours and conditions to be addressed before they turn into incidents.
- **Risk Management**: A process to identify and mitigate hazards must be implemented. When hazards are identified, steps must be taken to eliminate or reduce exposure by designing in safety, changing work procedures, requiring additional PPE or raising safety awareness.
- **Systemic Approach**: Ensure that all systems are designed to include a clear description of scope and objectives, processes and procedures used in the work activity, identify workers and management responsible for the execution of the processes and procedures, a measurement and verification process and a feedback system that analyses measurement and verification information for continuous improvement.
- **Partnership**: Learn from others to evaluate and implement the best possible Health and Safety Practices used for implementation.

Key Strategies for Achieving the Project's Safety Management Vision

1. Ensuring clear accountability for safety performance with line management. This may be accomplished through:
 - Clearly defined roles and responsibilities within the job description of each member of line management.
 - The establishment of Safety performance targets for each member of line management.

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- Periodic performance reviews (at least annually) shall be carried out to assess overall safety performance and accountability of line management.
- Line management health and safety performance initiatives, creativity and timely achievement of established targets will be recognized/rewarded, as appropriate. Poor overall performance will be noted and discussed with individual with an action plan to enhance overall performance.

2. *Implementing a formal leadership training program for all levels of management and supervision.*

This strategy will be accomplished by ensuring that:

- All project management and supervisory personnel attend and actively participate in the Nalcor safety leadership training program as soon as practicable.
- Project management and supervisors are encouraged to attend follow-up training sessions as and when provided.
- All Leadership Training Program attendees are encouraged to implement lessons learned from the training into the work environment, as well as engaging others in working discussions with Health and Safety as the issue.
- Leadership is encouraged to interact with other leaders/managers to discuss lessons learned and implementation strategies.

3. *Demonstrating tangible commitment and involvement by Senior Management towards the “relentless pursuit” of safety performance excellence is essential. This will be realized by:*

- Providing the appropriate level of resources, equipment and personnel to execute each work task safely.
- Actively participate in FELT Leadership, which includes strong, visible management commitment, recognizing management’s role of being a teacher, trainer and coach,

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always maintaining effective communications, and undertaking timely and meaningful auditing and re-evaluation processes.

- Establishing and maintaining Health and Safety as our core value through continually safeguarding the well-being of project personnel, the general public, and the environment through safe and environmentally responsible work practices associated with the design, construction, transportation and commissioning. Health and Safety must not be prioritized along with other business priorities.
- Continually striving to maintain an accident and incident free working environment at all project and contractor work sites, and ensuring total compliance with all Health and Safety applicable regulations.
- Always challenge and correct wherever possible any Unsafe Acts, Conditions or Procedures in a timely manner.
- Be actively involved in the SWOP process.

4. *Selecting competent Contractors for executing the work, while coaching and guiding them in the delivery of the Project in order to achieve our Vision. This is best accomplished by the following:*

- The Project Delivery Team, through line management will ensure that Contractor Health and Safety performance is monitored, and unsatisfactory Health and Safety performance and mitigating action are addressed in contract terms and conditions, as well as duly executed as and when appropriate.
- The Project Delivery Team will ensure an effective and workable procedure is in place to evaluate, and third party services shall ensure that prior to commitment, the risks are appropriately reviewed and mitigating measures are identified and addressed.
- The Project Delivery Team will define third party performance expectations, as well as communicate and monitor Contractor performance requirements to ensure the following:

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- Establish and execute contracts and agreements that clearly incorporate Health and Safety requirements.
- Become actively involved in monitoring, mentoring and coaching Contractors, and ensuring Contractors' roles and responsibilities are clearly defined.
- Establish Health and Safety performance targets, metrics and measures. Ensure Health and Safety performance with Contractors are regularly reviewed and communicated, as well as Integrate appropriate actions/performance enhancement plans to improve overall Contractor performance.
- The Project Delivery Team and Line Management will periodically coordinate and/or conduct internal and external Health and Safety audits on Contractors and third party performance.

5. Involve all workers in safety management. This will be initiated by the following:

- Ensuring that all Employees and Contractor understand that they have a stake in the overall success of the project --- Health and Safety is everyone's responsibility.
- Actively encourage Employee involvement by holding them accountable and ensuring everyone does their part through periodic monitoring, inspections, assessment and audits.
- Encouraging participation into the Joint Occupational Health and Safety Committee (JOHS).
- Incorporating daily safety inspections as part of the Employee/Contractor job task.
- Ensuring Employees and Contractors are informed about safety inspections, injury and illness statistics, and other safety-related issues.
- Management and Line Supervisors should assign meaningful tasks to Employees and Contractors that support safety.

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- Management and Line Supervisors should place value in Employee/Contractors input and feedback with regard to improving the Health and Safety Program, as they often know more about safety problems and solutions than managers do.
- Holding Employees accountable by:
 - Including Health and Safety responsibilities in job descriptions, including compliance with Safe Work practices a part of performance evaluation.
 - Setting and measuring achievements toward meeting safety targets.
 - Ensuring Employees/Contractors with reckless or unsafe behaviours are appropriately disciplined and recognizing Employees and Contractors who contribute to keeping the workplace safe.

6. *Utilizing Safe Work Practices/behaviours to avoid accidents. This is best accomplished utilizing the following practices:*

- Site Health and Safety Orientations must be carried out prior to work commencement at the construction Site. The Health and Safety orientation is the most important communication tool that management has to clearly convey the safety expectations and responsibilities of the job task and working environment. To ensure everyone knows how hazards will be effectively identified, communicated and controlled.
- Ensure Safe Work Practices are clearly defined, documented and communicated to Employees and Contractors.
- Utilize SWOP (Safe Workplace Observation Program) as a means of not only recognizing unsafe work practices and behaviours, but recognizing the application of Safe Work Practices and behaviours. Please refer to Appendix "C" for additional information about the SWOP.

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- Incorporate and communicate Lessons Learned from incidents and near misses. Encourage reporting and investigating Near-Miss incidents and glean lessons learned and communicating them to other potentially affected personnel.
- Target safe work practices and procedures with the primary goal of eliminating incidents and injuries in the workplace.
- Employ frequent opportunities for reminders of established Safe Work Practices and behaviours to Employees and Contractors.
- Solicit feedback and input from Employees and Contractors regarding enhancement of Safe Work Practices/behaviours for tasks they are frequently involved with executing. Ensure that this feedback is heard, evaluated, addressed and timely feedback is provided in all cases.
- Review safe work practices periodically (at least annually) to ensure they are effective, meet regulatory requirements.

7. *Risk management and control practices can best be incorporated in daily work activities utilizing the following practices:*

- A TBRA (task-based risk assessment) is a risk management tool that should be used to evaluate risk prior to a new or complex work activity. The TBRA identifies personnel interaction with the work activity, the tasks to be performed, and the hazards associated with those tasks. The TBRA identifies known and potential hazards and emphasizes risk reduction.
- Step Back 5X5 is a process that encourages workers to identify hazards associated with all tasks before starting a job. It helps to promote a hazard management culture through continual self-evaluation. It is based on the principle of “engaging the mind before engaging hands” by: Stepping back 5 paces from the job; Investing 5 minutes

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(nominal) to step through the job mentally and identify plans to control hazards before starting the job. It is an informal personal planning process and essentially a mental JHA applied before starting all jobs.

- Systematically listen to those personnel that understand the risks of a particular task not only when a crisis occurs, but as the right way to manage activities on the Project.
- Develop safe working rules, practices and procedures based on risk experience, safety knowledge and competent work direction.
- Assess all anticipated known risks prior to starting a new activity or one that is conducted very rarely.
- Ensure Employees and Contractors are effectively trained in risk management practices and procedures, as well as actual application of risk management in actual practice. This includes processes, methods and tools available.
- Stimulate and maintain the desire and commitment of line management, contractors and employees to perform risk management practices in daily work activities.

8. *Establishing strong functional expertise in Health and Safety Management to be fully engaged in both strategic direction-setting and day-to-day project delivery activities. This can be accomplished by the following:*

- Selecting trained, capable, educated and experienced Health and Safety Personnel to provide appropriate guidance and direction for the overall Health and Safety Management effort, both strategically and on a daily basis.
- Providing strong functional and technical expertise to support the execution and implementation of Health and Safety Practices, policies, and processes relative to Contractor and Employee safety.

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- Focusing function and technical support on effective contractor Health and Safety Management throughout the course of the Project.
- Preparing and reviewing Project Safety and security management plans.
- Supporting the Project level execution of Contractor qualification and performance assessment processes.
- Supporting and contributing to the health and safety performance reporting processes.
- Supporting and facilitating construction, Contractor and Employee Health and Safety training.
- Monitoring regulatory developments, evolving issues and industry best practices, and proactively facilitates the continuous improvement of the Major Projects Health and Safety Management System.
- Providing coaching and mentoring to applicable Project Management to enhance Major Project's Health and Safety objectives.

9. *Focus on measuring leading indicators (e.g., field observations, interventions and Site inspections.*

This can be achieved through due consideration of the following:

- Project Management actively supports the concept of utilizing leading indicators as a measure for proactively controlling loss/damage.
- A “balanced scorecard” providing information on a range of Health and Safety activities will be utilized for the Project rather than a single performance measure.
- Measurement of leading indicators provides information on how the Health and Safety Management System operates in practice, and identifies areas where remedial action is required and provides a basis for continuous improvement and provides a mechanism for feedback and consequential motivation.

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- Employees and Contractors must clearly understand exactly what proactive/leading indicators are being measured and what significance the use of the measurement will have on producing the desired performance result.
- Leading indicators are to be utilized as a means of publicizing data with the Project workforce, which focuses attention on a particular program area and is, by doing so, will lead to safety improvements in a short period.
- Key Project activities in the Health and Safety Management System that need to be encouraged, reinforced, and to visibly drive the culture. Such activities will be selected and measured, wherever possible.

10. *Development of an Incident Management and Emergency Response Management Plan/Program that reflects the uniqueness/specifics of the work and associated work locations. This can be achieved with consideration of the following:*

- Identifying all reasonable/probable risk events/scenarios specific to the Lower Churchill Project that may require incident management and/or emergency response. Examples for the LCP will include, but not limited to, fire, explosion, flooding, civil unrest, equipment failure, vehicle/transportation incidents (including helicopter incidents), extreme weather, and missing or lost personnel.
- Ensuring adequate resources are available at the Site location or, where possible, mutual aid agreements are established, which would allow appropriate resources to be moved to the Site in the event they are required.
- Identifying Key Incident/Emergency Response Personnel, Communications Links, Roles and Responsibilities, Emergency Support Services, Logistics coordination, Alert/Emergency Criteria. Contact numbers must be continuously updated/maintained.
- Ensuring key communications links are established, communicated, maintained and tested via drills on a frequent basis.

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- Developing procedures which provide clear instructions to Emergency Response Team with a focus of minimizing and/or containing damage and risk to others.
- Ensuring external agencies such as the RCMP, RNC, and the OH&S Division are contacted as and when appropriate, and stipulated in the incident/emergency management procedures.
- Business Recovery measures are identified and implemented after the incident/emergency is stabilized and under control.
- Fully investigate all emergency response incidents, and other incidents as appropriate, to identify lessons learned and communicate these to affected personnel.

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2 PURPOSE

The purpose of this document is to outline the overall Health and Safety Management Plan for the Management of Occupational Health and Safety on the Project. This LCP Health and Safety Management Plan defines the LCP expectations for Health and Safety planning and performance, as well as describes how the Project will establish the Health and Safety Management System, including implementing the associated initiatives. It serves to provide the guidance, framework, and details of how the Safety Credo will be embedded with the LCP.

This Health and Safety Management Plan has been developed in full alignment with the Health and Safety Management System, as well as all applicable Nalcor Energy Resources Health and Safety Policies. The Health and Safety Management System and applicable processes and procedures will be utilized throughout the Project. In the event that any Contract/Subcontract Company or functional group also has control mechanisms, in which safety work practices are identified in the plan, the more rigorous of the two will be implemented.

This Health and Safety Management Plan will help ensure that work conducted at all stages of the LCP complies with the intentions of the overall Health and Safety Management System, Health and Safety Policy and the Safety Credo.

The Project Delivery Team must fully understand and effectively apply the LCP Health and Safety Management Plan, as well as supporting documents, policies, programs and procedures to all phases of design, construction, commissioning, and full power. The ultimate objective to ensure that all risks are minimized to As Low And Reasonably Practicable (ALARP) and a relentless pursuit of an incident free working environment is maintained at all times.

The LCP Health and Safety Management Plan must be utilized effectively by all Lower Churchill Project Delivery Team Members. Contractors and Subcontractors must have Health and Safety Plans that align with this plan. For the Strait of Belle Isle Crossing (SOBI), the Contractor executing the work will bridge to this Health and Safety Plan via coordination mechanisms.

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3 SCOPE

The Project Delivery Team provides the overall project management for the planning and execution of the LCP and will fully utilize this Health and Safety Management Plan. It is intended that this Health and Safety Management Plan be applied to all parties associated with the LCP, including Nalcor Energy LCP Employees, Contractors, Suppliers, and Consultants. It is a key functional component of the overall LCP Project Management System. Nalcor Energy LCP will require each of its Contractors to have an effective and functional Health and Safety Environmental Management System in place, which is reviewed during the Contract bidding evaluation phases of all planned and executed Contract activity. Consistency of the Contractor Health and Safety Management System with the Nalcor Energy LCP Health and Safety Plan shall be addressed through a bridging document. Periodic due diligence audits will be conducted by Nalcor Energy LCP Health and Safety personnel to ensure all objectives, programs and practices monitored are maintained and achieved.

The LCP Health and Safety Management Plan is applicable for all phases of the Lower Churchill Project, including Planning, Design (Preliminary and Detailed), Procurement, Construction, Over-site, Completion and Ready for Operations. This includes the following Sub-Projects of the LCP (Phase I):

- Muskrat Falls Generation
- Labrador-Island Transmission Link
- Labrador Transmission Assets

This Health and Safety Management Plan is intended to incorporate all applicable Nalcor Health and Safety Practices, Policies, Procedures and Programs, as well as achieve compliance with applicable legislation and regulations, which includes the Newfoundland-Labrador OHS Act and Applicable Regulations. Variations in the standards must be communicated to all LCP Personnel, which includes all Contractors and Subcontractors. As such, this Plan will function as an overarching document and focal

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point standard, by which the Nalcor Health and Safety documents and subcontractor documents must bridge and adhere to.

4 DEFINITIONS

Hazard

The potential to cause harm, including ill health and injury, damage to property plant, products or the environment, production losses or increased liabilities.

Integrated Management System (IMS)

A framework of “coordinated” and “controlled” functional management resources, processes, procedures and tools that organize and direct the LCP with regards to established “project success criteria”, as defined in the LCP Project Charter.

Project Delivery Team

The Project Delivery Team includes managers who functionally report up to the LCP Project Director.

Management System (functional)

This system identifies management resources, processes, procedures and tools necessary to facilitate the achievement of the accountabilities/responsibilities of a functional group. The LCP functional groups correspond to the various functional responsibilities such as Health and Safety, Environmental, Quality, Engineering, Commercial Services, Project Services, etc., as identified in the Project Charter.

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5 ABBREVIATIONS AND ACRONYMS

A/I	Accident/Incident
ALARP	As Low as Reasonable Practicable
ATV	All-Terrain Vehicle
CoF	Certificate of Fitness
CSA	Canadian Standards Association
DnV	Det Norske Veritas
FMEA	Failure Modes and Effects Analysis
FTA	Fault Tree Analysis
H&S	Health and Safety
HAZID	Hazard Identification Review
HAZOP	Hazard Operability Review
HSE	Health, Safety and Environment
IRS	Internal Responsibility System
ER	Emergency Response
ISO	International Organization for Standardization
PDT	Project Delivery Team
JOHS	Joint Occupational Health and Safety
LCP	Lower Churchill Project
LITL	Labrador Island Transmission Link
LMS	Learning Management System
LTA	Labrador Transmission Assets
MF	Muskrat Falls

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MOC	Management of Change
MSDS	Material Safety Data Sheet
NE	Nalcor Energy
OHSAS	Occupational Health and Safety Assessment Standard
PMT	Project Management Team
PPE	Personal Protective Equipment
PTW	Permit to Work
QRA	Quantitative Risk Assessment
RCMP	Royal Canadian Mounted Police
RFO	Ready for Operations
RNC	Royal Newfoundland Constabulary
SCAT	System Causation Analysis Technique
SOBI	Strait of Belle Isle
SWOP	Safe Workplace Observation Program
TDG	Transportation of Dangerous Goods
TBRA	Task Based Risk Assessment
TLV	Threshold Limit Value
TSA	Task Safety Analysis
WHMIS	Workplace Hazardous Material Information Sheet

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6 REFERENCES

- LCP Security Management Plan – Nalcor Doc. No. LCP-PT-MD-0000-HS-PL-0005-01
- Occupational Safety and Health Act
- Project-Wide Emergency Response Plan – Nalcor Doc No. LCP-PT-MD-0000-HS-PL-0004-01

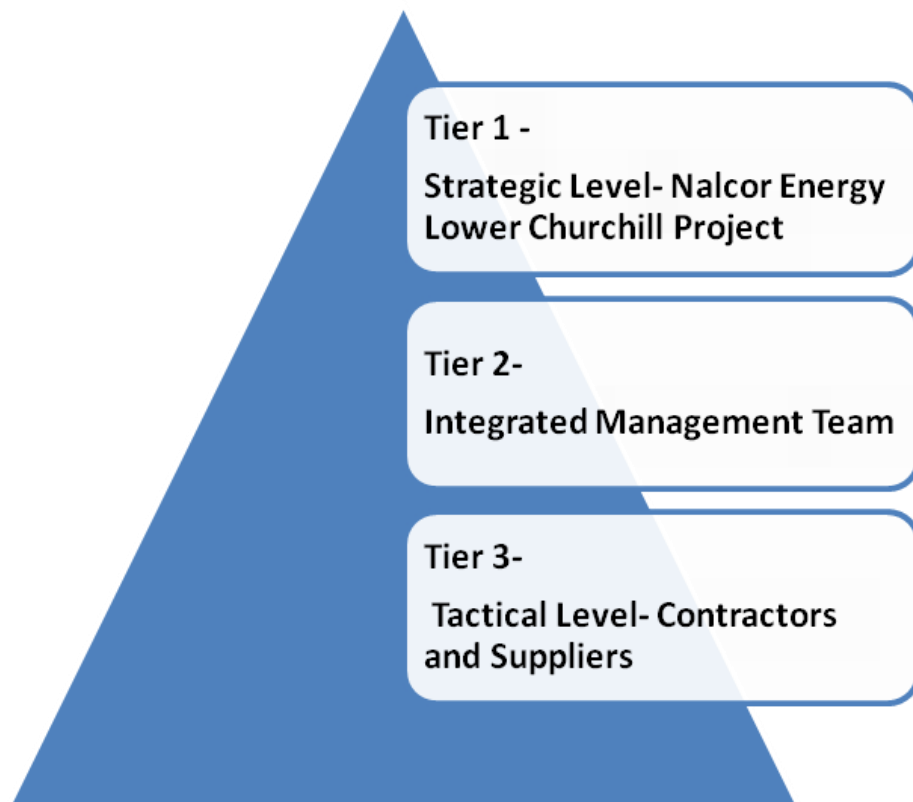
7 ROLES AND RESPONSIBILITIES

This section denotes specific roles and responsibilities for key positions within the project team. If each individual filling these positions effectively executes these roles/responsibilities, the building of an effective Health and Safety culture will be assured.

The following chart (along with the explanation below it) identifies the three (3) distinctive tiers with respect to how Occupational Health and Safety is typically managed in an Integrated Management Model and will be managed for the Lower Churchill Project. The Tiers identify the level of involvement for Nalcor Energy, the Project Delivery Team, as well as Contractors and Suppliers with each taking on a broader role. The chart also clearly defines roles and responsibilities within each tier level.

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Figure 1 : Occupational Health and Safety Management Roles and Relationships for Project Delivery Team Scope- LCP



Tier 1: Strategic Level

- Communicates and demonstrates “Zero Harm - Nobody Gets Hurt” Commitment
- Establish LCP Safety Management System and Strategic Management Plan
- Establish expectations of Consultant’s Health /Safety Plan through Coordination Procedures
- Review and Approve Health and Safety Plan and Site Plans
- Chair Project Level Health and Safety Steering Committee
 - Monitors Performance and coaches Consultants, Contractors and Suppliers to achieve desired outcomes.

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Tier 2: Project Delivery Team

- Responsible for scope level management of work.
- Develops a LCP Health and Safety Management Plan based upon Nalcor's Health and Safety Management Plan
- Develops Site Specific Health and Safety Plan for all work sites.
- Establishes the necessary plan enablers (people, processes and tools)
- Selects subcontractors and suppliers who are able to execute their work scope safely.
- Demonstrates "Zero Harm - Nobody Gets Hurt" commitment.
- Reviews and approves Subcontractors Health and Safety Management Plans
- Charters and Chairs Site Health and Safety steering committee.
- Monitors performance and coaches Subcontractors to achieve desired outcomes.

Tier 3 Tactical Level

- Develops a Project Health and Management Plan based on its Company Health and Safety Management Plan
- Develops Site Specific Health and Safety Plan(s) for its Worksite
- Utilizes its people, processes, and tools to manage work-place safety
- Focuses on Task Based Hazard Management and Work Competency
- Participates in Health and Safety Steering Committees
- Proactively engage the worker to promote a "Zero Harm - Nobody Gets Hurt" mindset

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7.1 PROJECT DIRECTOR

The Project Director is responsible for ensuring the Lower Churchill Project – Health and Safety Management Plan is fully implemented and effective, providing input on strategy development for each project deliverable, sanctioning the manpower and resources necessary for implementation of the LCP Health and Safety Management Plan and holding personnel accountable for its implementation and continued maintenance. The Project Director communicates and coordinates with Nalcor Corporate Staff, as well as Project Staff on a daily basis.

The Project Director's responsibilities from a Health and Safety perspective, include, but are not limited to, the following:

- Clearly communicate Health and Safety expectations for the Project.
- Demonstrate tangible commitment and involvement toward the relentless pursuit of Safety Performance Excellence.
- Provide leadership for full implementation of Health and Safety policies, management systems and safety requirements to achieve Health and Safety objectives.
- Ensuring compliance with all applicable regulatory requirements is achieved and maintained.
- Be responsible for health and safety of personnel.
- Be a good role model for others to follow. Continually promote a high level of Health and Safety awareness.
- Periodically audit the Health and Safety programs effectiveness with the target for continuous improvement.
- Ensure all incidents are reported and investigated as required and corrective action taken to prevent recurrence.

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- Ensure all core competencies and training needs are identified and training objectives outlined and achieved.
- Take all reasonable measures to prevent injuries to all personnel on the Site (including visitors), who are exposed to hazards on the Worksites under their control.
- Actively participate in safety plan activities
- Recognize significant safety achievements/accomplishments
- Reinforce Health and Safety as integral core values.
- Enhance workplace morale and attitudes

7.2 PROJECT MANAGER

The Project Manager is responsible for ensuring the Lower Churchill Project – Health and Safety Management Plan is fully implemented and effective, providing input on strategy development for each project deliverable, sanctioning the manpower and resources necessary for implementation of the LCP-Health and Safety Management Plan and holding personnel accountable for its implementation and continued maintenance. The Project Manager communicates and coordinates with the Project Staff on a daily basis.

The Project Manager's responsibilities from a Health and Safety perspective, include, but are not limited to, the following:

- Clearly communicate Health and Safety expectations to the respective Project Management Team.
- Provide effective leadership and guidance at the Project Management Level for full implementation of Health and Safety policies, management systems and safety requirements to achieve Health and Safety objectives.
- Demonstrate tangible commitment and involvement toward the relentless pursuit of Safety Performance Excellence.

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- Ensuring compliance with all applicable regulatory requirements is achieved and maintained during project planning, design, construction and overall execution of the project.
- Support and attend (where possible) the formal health and safety leadership training periodically.
- Be responsible for Health and Safety of all Project personnel.
- Be an engaged role model for others to follow. Continually promote a high level of Health and Safety awareness.
- Assist the Project Director, as well as the Health and Safety Manager to audit the Health and Safety programs effectiveness with the target for continuous improvement.
- Ensure all incidents are reported and investigated as required and corrective action(s) taken to prevent recurrence and communicated to others to prevent recurrence.
- Ensure all core competencies and training needs are identified and training objectives outlined and achieved within the Project Management Team.
- Take all reasonable measures to prevent injuries to all personnel on the Site, including visitors who are exposed to hazards on the Worksites under their control.
- Actively participate in safety plan activities as well as periodic reviews.
- Recognize significant safety achievements/accomplishments.
- Reinforce Health and Safety as integral core values.
- Enhance workplace morale and attitudes through effective communications, recognizing accomplishments and outstanding Health and Safety performance.

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7.3 LCP HEALTH, SAFETY, SECURITY AND EMERGENCY RESPONSE MANAGER

The Nalcor Energy LCP Health, Safety, Security and Emergency Response Manager is responsible for ensuring the LCP-Health and Safety Management Plan is developed in conjunction with those developed by Nalcor Energy Corporate policies and best practices, regulatory guide lines, major Contractors, and communicated to the Project Director, as well as all Nalcor Energy LCP Managers, Supervisors and Employees, Contractors, Subcontractors and consultants.

The LCP Health, Safety, Security and Emergency Response Manager's responsibilities include, but are not limited to, the following:

- Clearly communicate Health and Safety expectations for the project.
- Be responsible for promoting Health and Safety practices, policies and procedures for all personnel.
- Be responsible for establishing strong functional expertise in Health and Safety management, who are fully engaged in strategic-direction setting and day-to-day Project delivery activities with Area/Scope Managers and Construction Managers.
- Provide technical expertise and guidance pertaining to Health and Safety related issues, conditions, incidents and actions.
- Take all reasonable measures to prevent injuries to all personnel on the Site, including visitors who are exposed to recognized hazards on the worksites under their control.
- Demonstrate tangible commitment and involvement toward the relentless pursuit of Safety Performance Excellence.
- Coach Management and Supervisory Staff on effectively incorporating Health and Safety practices, policies and procedures as and when necessary.
- Provide safety feedback to Workers, Supervisors, and Managers.

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- Be a visible and effective role model for others to follow. Continually promote a high level of Health and Safety awareness.
- Actively participate in safety planning activities.
- Coordinate formal Health and Safety leadership training for all levels of management and supervision.
- Recognize significant safety achievements/accomplishments in a timely manner.
- Continually reinforce Health and Safety as integral core values.
- Enhance workplace morale and attitudes through effective interaction.
- Periodically audit the Health and Safety programs effectiveness with a target of continuous improvement and establish key performance indicators.
- Ensure all incidents are reported and investigated as required and corrective actions are taken to prevent recurrence. Communicate lessons learned from incidents and near misses to potentially affected personnel to better prevent recurrence.
- Ensure all core competencies and training needs are identified and training objectives achieved.
- Monitor effectiveness of hazard evaluation and reporting process.
- Actively participate in the audit/assessment process, providing guidance, support and professional expertise.

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7.4 LCP HEALTH AND SAFETY MANAGEMENT TEAM

The LCP Health, Safety, Security and Emergency Response Management Team responsibilities from a Health and Safety perspective include (but are not limited to) the following:

- Ensuring that supervisors, leaders and employees comply with the requirements of the LCP-Health and Safety Management Plan to the extent applicable to their respective mandates.
- Attend and participate in formal Health and Safety Leadership Training targeted at all levels of management and supervision.
- Ensuring that Health and Safety programs comply with contractual and regulatory requirements.
- Reinforcing that workers are informed of Site specific hazards and conditions and are adequately trained in safe work practices and procedures.

7.5 SUPERVISORS, LEADERS AND EMPLOYEES

Supervisors, Leaders and Employees are responsible for:

- Fully understanding the LCP-Health and Safety Management Plan and communicating the specific requirements applicable to their team members and contractors ensuring that deliverables are met within the stipulated timeframes.
- Line Management will be held accountable for the Health and Safety Performance of their subordinates and contractors.
- Communicating Health and Safety expectations to your subordinates and always being a good role model and example.
- Actively participate in Health and Safety Plan activities.
- Ensuring compliance with all corporate policies, procedures and practices included in this Management Plan and applicable regulatory requirements.

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- Confirming that all workers are suitably trained and adequately qualified and have sufficient knowledge and experience to perform their work safely.
- Participation in hazard assessments carried out at the Worksites.
- Promptly report high potential Health and Safety near-misses and incidents.
- Monitor the Worksite and correct any unsafe conditions or unsafe worker behaviours promptly.
- Attend and participate in formal Health and Safety Leadership Training targeted at all levels of management and supervision.
- Ensure recognized hazards are eliminated to the extent practicable and ensuring any remaining identified hazards are adequately controlled/communicated to affected personnel. Identify and correct unsafe behaviours and conditions as soon as practicable.
- Always provide constructive feedback to subordinates.
- Continually assess leading and lagging performance indicators for trending to define and implement continuous improvement opportunities.
- Ensure appropriate personal protective equipment is readily available at the Worksite, correctly used, stored and maintained and replaced when necessary.
- Be a safety resource and informal trainer/coach.
- Understand the capabilities and limitations of subordinates.
- Make every effort to enhance workforce morale and attitudes.

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7.6 PROJECT DELIVERY TEAM, EMPLOYEES, CONSULTANTS AND STAFF

Project Delivery Team, Employees, Consultants and Staff are responsible for ensuring the LCP Health and Safety Management Plan is maintained and followed and identifying areas for continuous improvement to their respective managers and supervisors. Additionally, they are responsible for the following:

- Acquaint themselves with the recognized hazards that may exist in the activity they will be undertaking or the locations they will be working and the appropriate mitigating measures.
- Be a good role model to co-workers.
- Actively participate in Safety Plan Activities.
- Refuse to undertake unsafe work or utilize unsafe equipment believed to be unsafe.
- Perform all tasks with due regard to safety, as well as Health and Safety of co-workers, the public and the environment. Pre-plan safety as an integral core value.
- Participate in safety orientations, training sessions, programs and meetings and make positive suggestions to improve worker safety (utilize the SWOP program)
- Comply with all applicable safety policies, procedures, programs and regulatory requirements.
- Always use the required personal protective equipment and clothing.
- Report all Safety, Health and Environmental incidents, as well as Near-Misses to your supervisor.
- Continually evaluate your own competency and make every effort to enhance your skills and capabilities.
- Know your co-worker's abilities and limitations, as applicable.
- Always use the appropriate safety and personal protective equipment required for the job.
- Report all unsafe conditions, imminent danger and potential hazards to your supervisor immediately.

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7.7 CONTRACTORS AND SUBCONTRACTORS

Contractors are responsible for familiarizing themselves with the LCP-Health and Safety Management Plan, as well as for ensuring workers are orientated to the safety plan for health, safety and environmental objectives, which are to be achieved and maintained. All Contractors and Subcontractors providing a service or support to the LCP-Health and Safety Management Plan are required to work in accordance with the provisions of this Plan.

Additionally, they are responsible for the following:

- Acquaint themselves with the hazards that may exist in the activity they will be undertaking or the locations they will be working as well as appropriate mitigating measures.
- Refuse to undertake unsafe work or utilize unsafe equipment believed to be unsafe.
- Perform all tasks with due regard to safety, as well as health and safety of co-workers, the public and the environment.
- Participate in safety orientations, training sessions, programs and meetings and make positive suggestions to improve worker safety.
- Comply with all safety policies, procedures, programs and regulatory requirements.
- Always use the required personal protective equipment and clothing.
- Report all Safety, Health and Environmental incidents, as well as Near-Misses to your supervisor.
- Report all unsafe conditions, imminent danger and potential hazards to your Supervisor immediately.

NOTE: *All personnel related to the Project are responsible for their own safety, the safety of their fellow workers and for applying these LCP-Health and Safety Management Plan principles to their work task each day.*

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Utilizing a well-defined bid and selection process; Nalcor Energy-Lower Churchill Project Contractors are responsible for providing fully certified equipment onshore and offshore (where applicable) that meets its class designation, including the equipment, crews, and Health and Safety management systems. The Contractor also operates and maintains the right to the obligations defined in the Contractor's Health and Safety Policies and Procedures to ensure that Health, Safety and Environmental management is integrated into all of its business activities. All Contractors will:

- Advise each manager, supervisor, employee and contractor of his/her Health and Safety Roles and responsibilities prior to job commencement.
- Comply fully with all applicable Occupational Health and Safety Act and applicable regulations.
- Provide safe working rules, practices and procedures based on risk experience, safety knowledge and competent work direction.
- Assess all anticipated known risks prior to starting a new activity or one that is conducted very rarely.
- Ensure employees are qualified and trained to perform the tasks they are assigned.
- Make every effort to eliminate or minimize potential damage to equipment, vessel or environment.
- Investigate all incidents/accidents and take corrective action as appropriate.
- Ensure an immediate and effective response to emergencies is established and maintained and that all personnel understand their roles and responsibilities.
- Provide competent and trained professional staff to support Health and Safety activities.
- Monitor and report Health and Safety performance with a focus on continuous improvement.
- Establish a strong Health, Safety and Environmental culture within all working groups/teams and Contractor for The Lower Churchill Project.

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- Every Employee of the main Contractor has the responsibility to:
- Promptly report all Hazards, Incidents and Near Miss occurrences
- Practice good “common sense” safety principles
- Provide constructive ideas and concerns so as safety efforts and initiatives might be further strengthened
- Become actively involved in the Health and Safety Program
- Comply with all federal, provincial and local regulations directly related to Health, Safety and Environmental

The above objectives will be accomplished by implementing the Health and Safety Plan in conjunction with the LCP and Contractor Health and Safety Policies and Procedures, as well as the Newfoundland and Labrador OHS Act and associated regulations. ***(NOTE: In the event of a conflict regarding regulatory/required information within this plan and the Contractor’s plans, the most stringent requirement will always take precedence.)***

7.8 ACCOUNTABILITY

All Personnel working on the Lower Churchill Project are accountable for:

- Establishing and maintaining Occupational Health and Safety through continually safeguarding the well-being of Project personnel, the general public, and the environment through safe and environmentally responsible work practices associated with the design, construction and transportation of the Nalcor Energy-Lower Churchill Project structures and equipment.
- Continually striving to maintain an accident and incident free “Zero Harm – Nobody Gets Hurt” working environment at Nalcor Energy-Lower Churchill Project and its contractors Worksites.
- Ensuring total compliance with the OHS Act and all applicable Health and Safety regulations.
- All Personnel involved in the Nalcor Energy-Lower Churchill Project are accountable for keeping to the following Safety Rules.

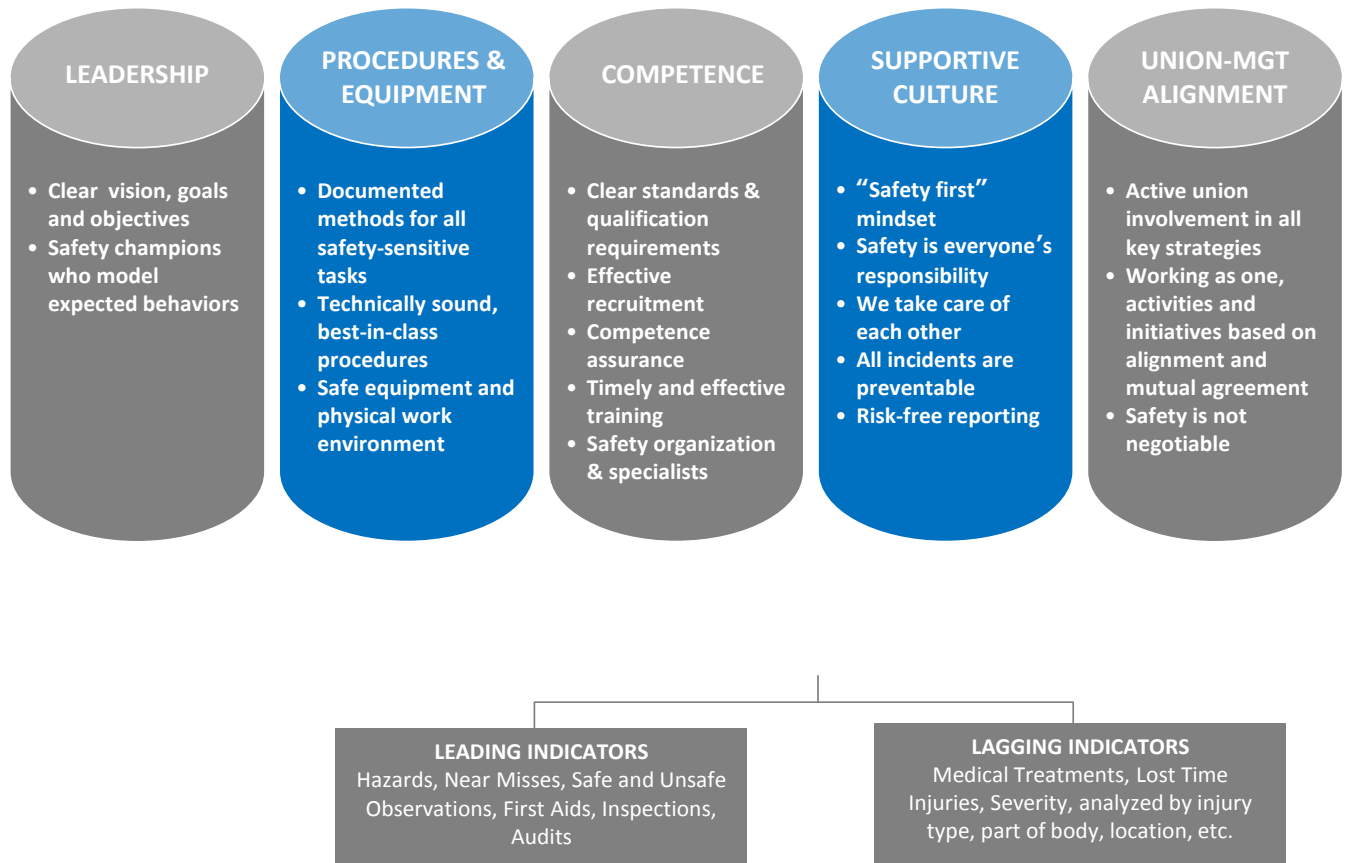
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- Ensure Health and Safety always core values within all aspects of the Project and are not prioritized along with other business priorities.
- Always follow established Safe Practices and Procedures – if they are not safe, advise your Supervisor and have them changed or modified.
- Always challenge and correct wherever possible any Unsafe Acts, Conditions or Procedures that you observe or otherwise come to your attention.
- Report all Safety Observations and Undesired/Near Miss Events and use your Safe Workplace Observation Program (SWOP) cards (see it – fix it – report it)
- Only start on a task when you have all the authorizations and permits in place.
- Always STOP/Intervene a task if you are not satisfied that it is safe to continue or it presents a risk to others.

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8 HEALTH AND SAFETY MANAGEMENT SYSTEM FRAMEWORK

Figure 2 : Health and Safety Management System Framework



The foundation of the Health and Safety Functional Management System Framework has been established and implemented based on the following:

- Safety Credo (Section 8.1- Figure 3)
- Health and Safety Policy (Sections 9, 9.1)
- Guiding Principles and Performance Objectives (Section 9.2)
- Occupational Health and Safety Management Plan (A Management Plan that describes in detail of how the specific guiding principles and objectives will be achieved using specific enablers.)

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- Enablers (People, Practices, Procedures and Tools that enable the implementation of the Plan)
- Roles and Responsibilities (Section 7)
- Individual Behaviours and Actions (Engaging personnel to act in a manner so as to minimize risk to the individual, the environment and stakeholders)

8.1 SAFETY CREDO

Our approach to managing safety on the Lower Churchill Project is rooted within the Safety Credo. Every member of the Lower Churchill Project is expected to work in accordance to the Safety Credo (Section 9.0) and to utilize the available tools and procedures that are required to complete their job safely.

The safety of our Employees, Contractors, Visitors and the public is our first and most important priority. Our goal is a workplace where “Nobody Gets Hurt -- Zero Harm” and a working environment where each and every employee is always concerned for their own safety and the safety of others. Everyone on the Lower Churchill Project is personally committed to these basic safety values as the foundation for our success as a safety leader.

The Safety Credo has three (3) basic rules to live by:

- 1) I always follow safety requirements and best practices
- 2) I always take time to complete my work safely
- 3) I always take action when I see unsafe acts or conditions

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Figure 3 : Safety Credo



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9 HEALTH AND SAFETY POLICY


A written general policy statement can effectively reflect corporate management's positive attitudes and acceptance of overall responsibility for health, safety and environmental protection. It demonstrates to NE-LCP Managers, Supervisors, Employees, Contractors, Subcontractors, Consultants and Visitors that the Health and Safety of workers and the preservation of the natural environment is a priority and takes precedence over expediency and shortcuts.

The LCP Health and Safety Policy reflect the Project Delivery Team's commitment to Health and Safety, and shall form the basis upon which the Health and Safety Management Plan and the LCP Health and Safety Management Plans of all Contractors, Suppliers, and Consultants working on the LCP are based.

This Policy and the goals embodied within it outline commitment and management to maintaining a safety culture within our organization in regards to the organizations of our Contractors and Subcontractors, and in all Project activities. It mandates the tangible demonstration of this commitment through compliance with the Health and Safety Policy and by making continual improvement an integral part of activities.

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9.1 NALCOR ENERGY CORPORATE OCCUPATIONAL HEALTH AND SAFETY POLICY



Nalcor Energy
Occupational Health and Safety Policy

The safety of our employees, contractors, visitors and the public is our first and most important priority. Our goal is a workplace where nobody gets hurt -- zero harm -- and a working environment where each and every employee is always concerned for their own safety and the safety of others. In support of this goal, Nalcor Energy and its employees are committed to the following guiding principles

- 1) Employees will govern their actions in accordance with Nalcor Energy's Internal Responsibility System for safety. This includes adherence to the principles of employee and role related responsibilities for their personal safety and the safety of their co-workers, contractors, visitors, and members of the public.
- 2) Nalcor Energy shall establish and maintain an Occupational Health & Safety Management System (HSMS) which:
 - a. meets or exceeds legislated requirements and is compliance with accepted industry standards and practice; and
 - b. documents health and safety objectives for Nalcor Energy; and
 - c. contains a mechanism for performance measurement and continuous improvement; and
 - d. facilitates both the formal and informal involvement of employees in the development, maintenance, and improvement of occupational health and safety within the organization.



President and CEO
Nalcor Energy

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9.2 GUIDING PRINCIPLES

The guiding principle upon which this Health and Safety Management Plan is built, includes the following:

- All incidents are preventable.
- Ownership by senior management and on-Site supervision is mandatory through direct involvement, a review of Health and Safety programs and efforts, and a focus on continuous improvement. Management must lead by example.
- Ensure appropriate resources and personnel are provided and available to execute the work safely and without adverse impact to health.
- Safety is a line organization function and cannot be delegated.
- As reasonable and practicable, Project Delivery Team has an obligation to eliminate or mitigate all known hazards and to ensure workers are fully competent and are supervised by a competent individual in the tasks to be performed.
- Management must understand and incorporate various safety practices and processes within the LCP and recognize when work activities, practices and procedures come in conflict with one another and instituting measures for mitigation.
- All Project Delivery Team personnel and Contractor personnel associated with the work have the right to be aware of the hazards, the right to participate, and the obligation to stop unsafe work without retribution.
- All personnel associated with the work are empowered to contribute to the Health and Safety efforts.
- Safety performance requires establishing procedures and programs, conducting training, contractor employee involvement, routine self-evaluation, and continuous improvement.

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- Prospective contractors must clearly understand that past health and safety performance will be part of the criteria used to select contractors to perform work for the LCP.
- When necessary, a contractor is expected to improve or implement processes where gaps exist between their programs and the LCP's expectations.
- Continuous improvement must be a permanent objective for the LCP. Opportunities for improvement must be identified, evaluated and applied systematically and logically.

9.3 HEALTH AND SAFETY MANAGEMENT PLAN FORMAT

The LCP Health and Safety Management Plan is structured in accordance with the OHSAS 18001 Plan-Do-Check-Act Model for continuous improvement. It also incorporates the seven core elements of Health and Safety Management as noted in the following figure:

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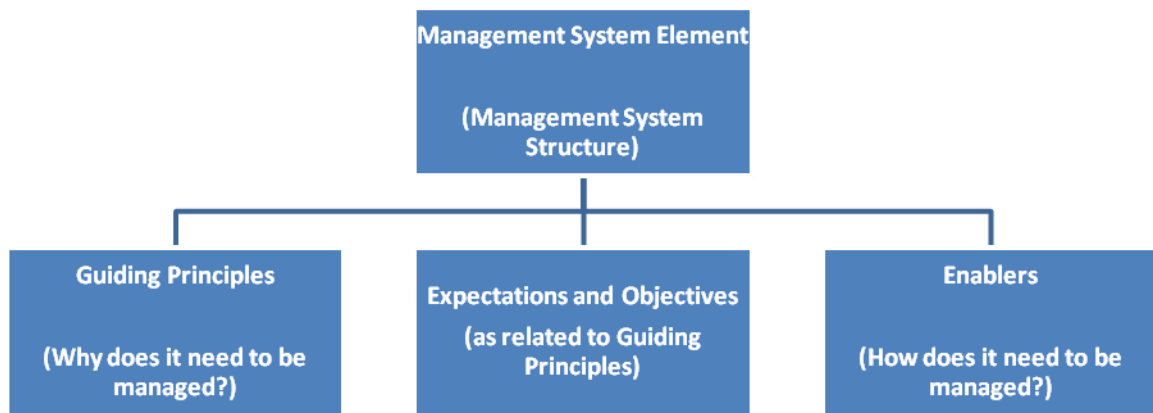
Figure 4 : Seven Core Elements of Health and Safety Management



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The Health and Safety Management Plan is structured to be both user-friendly and a useable resource. The basic format of the Plan includes a listing of sub-elements, guiding principles and enablers as defined below:

Figure 5 : The Health and Safety Management Plan (Basic Structure)



9.3.1 Element 1: Leadership (Commitment, Personal Behaviour, Accountability)

The Project Delivery Team is responsible for supporting the development, implementation and assessment of Health and Safety initiatives and control mechanisms addressing emerging issues and providing feedback as and when appropriate. The Project Management Team must establish the overall tone of Health and Safety Management and its foundation of the Project's overall culture.

Leadership Expectations: It is expected that all members of the Project Delivery Team will:

- Ensure that a positive Health and Safety Culture and Management System are established, implemented, communicated and supported at every level of the organization.
- Communicate Health and Safety performance expectations to others.
- Visibly demonstrate their commitment to the achievement of the Project's Health and Safety goals and objectives.

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- Be interested, visible and active in promoting Health and Safety processes and initiatives.
- Deal promptly and appropriately with Health and Safety improvement actions and suggestions within their area of control.
- Give appropriate consideration of Health and Safety performance as a key indicator of overall performance requiring equivalent management effort.
- Establish and maintain the standard for acceptable Health and Safety behaviours within the project by setting a model example themselves.
- Nominate Health and Safety Management Representative responsible for the overall coordination of the Management System and ensure the representative is trained in each of the Management Elements, expectations and roles responsibilities.
- Allocate appropriate resources to achieve our Health and Safety priorities and objectives.
- Where applicable, a clear Zero Tolerance policy is communicated to all employees (Examples include Drug and Alcohol Policy, Workplace Violence/Horseplay, etc.)
- A clearly defined disciplinary program must be communicated to all employees and applied fairly and uniformly.
- A clearly defined substance abuse prevention policy is posted and included in orientation literature.
- Business Code of Conduct is posted and in place.

Demonstrating Health and Safety Leadership: The Project Management Team can demonstrate Health and Safety Leadership by the following:

- Carry out Site visits with the principle objective to review, discuss or promote Health and Safety issues.
- Establish, Manage and Track Project and Individual Health and Safety performance toward established goals and objectives. Promote overall Health and Safety Performance Awareness.

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- Make Health and Safety a key agenda item at Management Meetings.
- Taking a proactive approach to the prevention of incidents as an integral part of our operations overall.
- Become actively involved in Health and Safety Coordination and Steering Committee (JOHS).
- Strive to achieve all aspects of personal Health and Safety performance Contract.
- Include Health and Safety roles, responsibilities and accountabilities in Manager job descriptions.
- Include Health and Safety performance as an integral part of the performance appraisal process.
- Include the nominated Health and Safety Management Representatives on the organization chart.
- Ensure effective Health and Safety Orientation Programs are in place covering Safety Standards, Policies, Procedures and Core Values.
- Enable Supervisor Health and Safety responsibility training to be provided periodically.
- Provide Behaviour based Health and Safety Training Programs periodically.
- Ensure Behavioural observations are performed.
- Encourage Health and Safety Surveys be performed, analyzed and used to establish corrective actions, as appropriate.

Taking Personal Responsibility: The Project Delivery Team, as well as personnel at all levels, must take personal responsibility for Occupational Health and Safety. To accomplish this, all personnel should exhibit the following:

- Sincere caring for others, their safety and their well-being.
- Be aware of their influence as a role model at work and during their spare time.

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- Sound health and safety behaviour on and off the job.
- Intervene constructively with at-risk behaviours and conditions
- Are attentive to others behavioural changes, and respond appropriately
- Follow defined Health and Safety policies, procedures, rules and standards.

Understanding Accountabilities: Everyone associated with the Lower Churchill Project, its operations and activities is accountable for their actions. Deviations from standards of acceptable behaviour are dealt with in a fair and consistent manner. Personnel at all levels of the organization must:

- Understand what is expected and are held accountable for their actions and inactions.
- Use their authority and responsibility to react to all observed or known at risk behaviours or unsafe conditions.
- Respond in an open and fair manner to incidents reported and issues raised.
- Practice tolerance for mistakes but are aware of and accept consequences for reckless behaviours.
- Must be open and receptive to constructive feedback from others.

9.3.2 Element 2: Communications (processes, information and documentation)

Effective and open communications are essential to the success of any Project. Successful internal communication is crucial to the development of an informed and motivated workforce. Efficient external communications preserves Nalcor's reputation and enhances our business standing and credibility.

Communications Expectations: For effective communications, arrangements must be made, which ensure that Managers can:

- Identify, develop and maintain systems for the control of information necessary for working safely and assure regulatory compliance with Health and Safety issues.

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- Ensure that personnel are properly informed of Health and Safety risks and control measures.
- Encourage employees at all levels to raise Health and Safety concerns without reprimand and shall respond to these concerns in a timely and appropriate manner.
- Fully support consultation on Health and Safety matters to explore opportunities for influencing issues.
- Ensure Health and Safety campaigns and initiatives receive adequate publicity.
- Support Health and Safety Representatives and committees to contribute to the Project's Health and Safety performance.
- Establish an effective channel between management, employees, third parties and clients concerning existing, new or evolving health and safety issues.
- Encourage Personnel at all levels to give feedback, propose improvements, share information and best practice.
- Support proper liaison with Clients, Contractors, Sub-Contractors and external bodies on Health and Safety issues occurs.
- Ensure that the LCP is represented on industry bodies and positioned to influence and shape Health and Safety policy and regulatory matters.
- Health and Safety achievements are given due publicity and recognition.

Establishing Effective Health and Safety Communications: Effective communications can be achieved through effective training, interaction, forums, policies, programs and health and safety meetings. The following Health and Safety Communication tools have been put in place to enable effective communications:

- Periodic Health and Safety meetings/daily toolbox talks carried out at the Worksite.
- Health and Safety Representatives committee meetings (JOHS Committee)

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- New Employee Orientation Sessions
- Periodic Project newsletters
- Health and Safety bulletins and alerts (Communicating Lessons Learned)
- Industry forum representation and participation
- Management site visits with focus on Health and Safety
- Meetings with Clients, Contractors/Subcontractors on Health and Safety issues.
- Emphasize and promote Health and Safety publicity campaigns
- Effective communication channels are in place without filtering mechanisms
- Forward communications which outline changes to Health and Safety practices, policies and procedures
- Training programs reviews carried out periodically to ensure current technology, applicable risks and regulatory requirements are addressed
- Employees suggestion program
- Encourage use of a Safety slogan/theme program
- Participate and support Safe Work Observation Program (SWOP)
- Track leading and lagging indicators

Expectations concerning Information and Documentation Management: The availability of accurate, relevant and current information and documentation is a key contributor to successful Health and Safety performance. Processes for capturing and sharing knowledge are in place to deliver the best available Health and Safety practice to our operations. Effective information and documentation management systems are in place such that:

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- Drawings and other pertinent documentation necessary for health and safety compliant operations are identified, current and readily accessible.
- All applicable regulations, codes and standards are identified, current and readily accessible.
- Document retention and archiving requirements are established and satisfied.
- The currency of the system and procedures is ensured.
- Roles and responsibilities in relation to information and documentation management are clearly understood.
- Appropriate use is made of electronic information management systems.

Effective Information and Documentation Management Mechanisms: The following mechanisms and management systems can be utilized to effectively store, research, retrieve and retain Project Information and Documentation:

- Integrated Management System
- Document management system
- Health and Safety plans and interface documents
- Health and Safety library and databases
- Internet
- Communicating Health and Safety Regulatory Changes and Interpretations
- Document Retention Procedures/Programs.
- Document Disaster Recovery Procedures
- Periodic Assessment/Audits of Informational Systems for Effectiveness, Compliance with Policies and Procedures.
- Regulatory Compliance Plan in place.

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- Lessons learned capture and implementation process.

9.4 ELEMENT 3: ORGANIZATION (COMPETENCE, PERSONAL DEVELOPMENT, ROLES/ RESPONSIBILITIES):

The success of Health, Safety and business performance within the Lower Churchill Project is largely influenced by the competency of Employees, Contractors and Sub-Contractors. While the maintenance of a stable, competent and motivated workforce is also a critical factor, Managers must also consider competency and personal development, as well as the following:

- Effective recruitment, selection and placement processes are in place and fully functional.
- Health and Safety competence requirements are identified, gaps analyzed and training programs are in place to close the gaps.
- A Health and Safety mindset and competence requirements are applied in recruiting, selection, succession planning and promotion at all levels.
- Personal appraisal/performance and development reviews are undertaken for employees.
- LCP employees are encouraged and supported in their career development.
- To the extent practicable, succession planning is in place.
- Ensure that a comprehensive training program is in place for all individuals to ensure the correct level of competence and Health and Safety awareness is attained prior to any change in their job duties.
- Health and Safety training is provided by competent personnel and its effectiveness is properly reviewed.

Means to Accomplish Workforce Competency and Personnel Development: Occupational Health and Safety must be included as a part of overall:

- Recruitment, selection and placement procedures.

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- Resource forecasting and allocation.
- Project site inductions.
- Position/role descriptions including competency requirements.
- Succession planning.
- Competency Assurance Systems/Testing and Verification.
- Personal appraisal and development programs, including a review of overall Health and Safety performance
- Training need analysis
- Training matrices / plans
- Program effectiveness evaluation including review of assigned tasks and targets with respect to health and safety roles.
- Competence training in health and safety policies and procedures, hazards awareness and required certifications

Understanding Roles and Responsibilities within the Organization: The defining and understanding of individual roles and responsibilities are key to the achievement of our project Health and Safety objectives. It is very important that the appropriate level of resources is allocated and responsibilities are clearly defined and communicated. To do so, arrangements must be in place to ensure that:

- Health and Safety roles and responsibilities are a clearly defined and integrated part of all job task roles, and are clearly communicated and understood.
- Appropriate resources are allocated to enable Project Delivery Team to reach its Health and Safety objectives.
- Appropriate health and safety resources are allocated in relation to project execution.

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- A health and safety function is in place to support the organization, is identified on organization charts, and reports at the highest appropriate level within the organization.
- Health and Safety committees and representatives are appointed, their roles are defined and they are involved in health and safety processes at all levels

Policies, Procedures and Programs for Assuring Competency/Personal Development: The following policies, procedures and programs are in place within the Lower Churchill Project to assure competency and personal development:

- Recruitment, selection and placement procedures.
- Resource forecasting and allocations.
- Position descriptions which include clearly defined Health and Safety competency requirements.
- Orientation/ Induction training program focusing on these expectations given to all employees.
- People surveys and interviews.
- Site health and safety procedures.
- Health and Safety resources included in budgets.
- Health and Safety function identified on organization chart and participates in business management meetings as appropriate.

9.5 ELEMENT 4: MANAGEMENT OF RISK/EMERGENCY PREPAREDNESS/HEALTH (RISK ASSESSMENT, EMERGENCY PREPAREDNESS, OCCUPATIONAL HEALTH, MOC)

The Lower Churchill Project must ensure that Occupational Health and Safety Risks arising from, or associated with its activities, are identified, addressed and effectively managed so as to eliminate or reduce them to a level that is As Low As Reasonably Practicable (ALARP). An effective means of risk management must be in place and fully functional and ensure the following:

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- Health and Safety risks are identified and their consequences and probabilities properly assessed to ensure that risks, as reasonably practicable, are assessed based on probability of occurrence, risk, severity, consequences to personnel and the environment and are controlled utilizing the following hierarchy (preferred actions to least desirable actions): **a)** Risk Elimination, **b)** Engineering Design to Mitigate Risk, **c)** Incorporate Safety Devices for Risks that cannot be mitigated, **d)** Provide Warning Devices or **e)** Personal Protective Equipment.
- Appropriate risk reduction or mitigation measures are identified and implemented and managed to completion.
- Risk assessments are facilitated and undertaken by competent personnel, including (where necessary) expertise external to the Project.
- Risk assessments are subjected to an appropriate review and validation process.
- Risk assessments are properly documented and action items closed in a timely manner.
- Affected personnel are made aware of, and understand risk assessment results, as well as recommendations relating to their activity.

Enabling Measures to the Risk Assessment/Mitigation Process: The following processes can assist with the execution of an effective risk assessment/mitigation task:

- Risk Policy is in-place and supporting risk management program, which includes the assessment of Health and Safety related risks.
- Ensure identified risks are addressed at the appropriate level within the project organization, given the nature and magnitude of the risk.
- Ensure adequate risk control equipment/practices are included as part of design, construction and operations.
- Risk register and risk mitigation / control plan are in-place and updated periodically.

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- Risk mitigation /control measures are effectively communicated to all affected personnel.
- Throughout the project execution phases perform various Health and Safety specific risk assessment / management activities.
- Conduct risk/hazard assessments, including the following techniques: HAZID (Hazard Identification), HAZOP (Hazards Operability Analysis), QRA (Quantitative Risk Assessment), FTA (Fault Tree Analysis), FMEA (Failure Modes and Effects Analysis).
- Conduct constructability assessments with due consideration of Health and Safety Factors/Issues.
- Conduct Task Based Risk Assessments (TBRA- Refer to Appendix C, page C-2 of this Plan)
- Implement Step Back 5 x 5 (Utilizing the 5x5 Risk Matrix to evaluate a particular work tasks)
- Implement WHMIS
- Conduct ergonomic assessments
- Conduct fire risk assessments
- Implement hazard recognition and reduction methods included in training

Changes in operations, organization, facilities, systems and procedures must be properly evaluated and managed in such a way as to minimize any potentially adverse Health and Safety impacts. Best Practices should be captured during the transitional phase. For changes of this nature, the following measures must be in place to allow for proper assessment and control:

- Organization, staffing, roles and responsibilities for change management
- Management systems, processes and procedures
- Facilities, plant, process and equipment
- Work scope/tasks include change management documentation requirements

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- Applicable regulations, procedures and standards
- Changes are appropriately documented, reviewed, approved, communicated and authorized prior to execution
- Change implemented is periodically monitored and reviewed and any action items resulting from the review are addressed in a timely manner prior to change closure

Enabling measures for Managing Risk as a result of Changes to Organization, Facilities, Systems and Procedures:

- Management of change process
- Personnel transfer/promotion processes
- Change control processes and procedures
- Levels of authority for change approval
- Monitoring, audit and review processes
- Change item action tracking
- Document/Communicate Changes
- Review/Approval Process
- Work scope changes
- Matrix of compliance related to authority rules and regulations.
- Monitoring, audits and review process
- Revision controlled technical documents

Emergency Preparedness is essential in order to protect personnel, the environment and assets. Emergency Response Plans are in place to allow us to respond effectively and efficiently in the event of

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an actual emergency. In order to effectively respond to an emergency, the following systems, plans, procedures and training must be in place:

- Emergency response plans are based on an assessment of potential incidents and threats, and are documented and well understood by all affected parties
- Emergency response management plans/programs must reflect the uniqueness/specifics of the work and associated work locations.
- Personnel with emergency response roles and responsibilities are fully trained and competent
- Appropriate emergency response facilities and equipment are provided and maintained in fully operable condition.
- Personnel security is assessed and included in emergency response plans.
- Interface arrangements with contractors, subcontractors and the community include well defined emergency response responsibilities.
- External communication roles concerning emergency responses are documented and understood by all parties.
- Emergency response drills and exercises are undertaken regularly.
- The competency of those involved in ER is assessed on an ongoing basis.

Emergency Response Plan Effectiveness/Efficiency: To best ensure the effectiveness and efficiency of the Emergency Response Plan, the following will be implemented at the Project Office and/or Field Construction Sites:

- Coordination procedures and documents clearly defining Emergency Response roles and responsibilities with Contractor interface.
- Emergency Response procedures and plans have been established and organization will be fully trained

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- New Employee / Visitor Orientation includes Emergency Response overview and discussion of specific roles and responsibilities.
- Periodic Emergency Response drills and exercises will be carried out with the target of continuous improvement.
- Emergency Response training conducted, including hands-on and simulated exercises, as appropriate.
- Duty rosters established and maintained current insuring that all key positions will be fully manned.
- Emergency Response facilities on site established and maintained in fully operable condition (e.g. first aid equipment, firefighting equipment, and emergency phone numbers posted at conspicuous locations).
- Evacuation plans prepared and in place and known to appropriate personnel.
- Equipment inspection records established and maintained current.
- Media interface training for emergency situations.

Occupational Health: The Lower Churchill Project will actively monitor its activities to ensure that appropriate measures and programs are in place to protect our employees from harm as a result of occupational health hazards. To accomplish this, Managers will ensure that:

- Prevent occupational illness or injury to the Project Team and field workforce by managing medical, public health and occupational health risks.
- Minimize the seriousness of injuries and illnesses by ensuring access to quality primary and emergency medical care.

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- Ensure that well planned, well documented and drilled procedures are in place for responding to remote medical incidents requiring significant medical attention and/or evacuation.
- Verify that all National, Provincial and Local Health Regulations are incorporated in Project plans and facility designs.
- Ensure satisfactory health management of Project Sites through health inspections and surveillance.
- All employees are encouraged to raise occupational health issues and concerns as they arise.
- Establish expectations that construction and installation contractors implement procedures and programs for ensuring healthy working conditions for personnel during the course of the Project.
- Ensure communication of known health related hazards and remedial measures to all affected personnel.
- Ensure that project activities do not inadvertently affect the health of Project personnel or local communities.
- Appropriate corrective/ preventative measures are implemented in a timely manner.
- Follow-up actions are taken to ensure appropriate provisions are adopted and fully implemented.
- Identify and implement regulatory and best practice medical practices, procedures and programs.

Implementing Health Measures and Programs: Methods for Implementing Measures and Programs designed to protect all personnel from harm as a result of Occupational Health Hazards include the following:

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- Employee Health Questionnaires
- Food Services Contractor Health Plans must be prepared and periodically reviewed/updated, which include organization charts, medical emergency response, worker immunizations/medical evaluations, known health risks, training requirements and health inspections, food handling, preparation and storage requirements.
- Ensure all personnel are fully trained and prepared for working conditions in Newfoundland and Labrador.
- Applicable periodic physicals
- Health communications through bulletins, e-mails, programs, training and procedures.
- Follow-up medical examinations, as identified and applicable.
- Medical evaluations for known and specified regulated activities
- Health Risk Assessments
- Worksite Health Assessments
- Worksite Health Inspections
- Health Awareness Training
- Health Related Awareness Bulletins
- Budget for medical and health assessments related to remote project locations, during planning phase.

9.6 ELEMENT 5: THIRD PARTY RELATIONS (CLIENTS/PARTNERS, CONTRACTORS/SUPPLIERS, COMMUNITY)

Establishing and Maintaining Effective Client/Partner Relationships: Effective Client and Partner interfaces and working relationships are critical for the Lower Churchill Project and for our common Health and Safety Performance. We work closely with clients and partners to manage our roles and align expectations and goals. Arrangements must be in place to ensure that:

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- Health and Safety expectations, objectives, responsibilities, roles and interfaces are clearly defined, documented and agreed between the involved parties.
- An open dialogue on Health and Safety issues is retained at appropriate levels within the organization.

Client/Partner Interface Processes: Processes that enable more effective Client/Partner Interfaces include the following:

- Health and Safety meetings (or segments of meetings)
- Bridging documentations
- Audit plans
- Reporting processes
- Role and responsibility definitions.

Third Party Contractors and Suppliers: The risk presented by third parties (contractors/sub-contractors and suppliers) can have a significant impact on the Project's health and safety performance and reputation. Such risks need to be properly managed to minimize potentially adverse effects. Third party health and safety performance is reflected in the overall LCP performance. To maximize Health and Safety Performance, the following must be considered and implemented:

- Third parties are selected based in part on consideration of their Health and Safety performance, planning, programs, policies and procedures.
- Health and Safety programs and overall compatibility with the Project's Management Systems.
- Third parties Health and Safety standards must be broadly similar to those of the Project and are appropriate to the risk criticality of the services and products provided.

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- Suppliers and sub-contractors are involved at an early stage to allow risks to be identified and properly managed.
- The Project requirements with respect of Health and Safety Responsibilities and performance are defined and communicated to third parties.
- Third parties have clearly defined roles and responsibilities for their individual managers.
- Interfaces between the Project and third parties is clearly defined and effectively managed.
- Monitoring of third party performance includes Health and Safety and deficiencies are identified and corrected and preventative measures are put in place.
- Contractors/subcontractors and suppliers understand that consequence for poor Health and Safety performance, or lack of agreed improvements, can be up to and including stop work orders and in extreme cases termination of work
- Lessons learned from third parties are captured and openly shared within the Project Delivery Team.

Effective Selection Processes: Processes that enable the effective selection of contractors and suppliers include the following:

- Selection strategy documentation for major and minor package suppliers
- Contractor pre-qualification and selection process
- Pre-bid Meeting reviewing Health and Safety Expectations with bidders
- Pre-contract award Health and Safety assessment
- Safety performance terms and conditions included in contracts
- Health and Safety Coordination Procedures contained in all contracts
- Health and Safety development program/improvement plan

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- Regular meetings with all contractors
- Site visits to Contractor/Supplier Worksites
- Interface documentation review
- Performance monitoring plans and strategies
- Periodic Performance Audit and associated follow-up
- Contract and/or project close-out reports
- Contractor Health and Safety Plan prepared to address the specific scope of work

Relationships with Neighbouring Communities: Keeping good community relations are crucial for our long term success. In the course of the Lower Churchill Project, we must be focused on being a good neighbour and seek to find opportunities to contribute to the well-being of communities in which we operate. Effective means of ensuring good relationships are maintained with Neighbouring Communities include ensuring the following:

- Risks to the communities associated with the Lower Churchill Project are openly communicated to the appropriate parties in a timely manner.
- Our project contributes in a positive manner to the communities where we operate.
- We cooperate with authorities, non-government organizations and industry organizations on health and safety matters.

Maintaining Effective Relationships: Good relationships with the Neighbouring Communities of the Lower Churchill Project Worksites are very important to the overall success of the Project. Effective means of maintaining Community relationships include the following:

- Emergency response plans (including the focus on the neighbouring community)
- Open facility and family days with Health and Safety focus, as and when appropriate.

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- Health and safety initiatives with local schools, and voluntary groups.
- Stakeholder management plans that include consideration for Health and Safety issues through all phases of the Project.

9.7

9.8 ELEMENT 6: PRODUCT REALIZATION: (EQUIPMENT AND MATERIALS)

Interfaces and relationships with clients and partners are critical for the Lower Churchill Project overall Health and Safety performance. The Project Delivery Team will work closely to manage our roles and align expectations and goals. To accomplish this, the following arrangements must be in place:

- Proper selection and specification of the facility, equipment and materials take place.
- Effective procurement processes and quality control systems are in place to minimize risk importation.
- Facility, equipment and materials provided are safe, compatible, of good quality and fit for their intended service and are renewable/recyclable (whenever possible).
- Fully compliant with equipment inspection, certification, quality assurance and maintenance requirements.
- Appropriate information, instruction and training on the safe use, handling storage and environmentally sound methods of disposal of plant, equipment and materials are made available to affected personnel.

Ensuring Project Facility, Equipment and Materials meet Project Expectations: Ever effort will be made to ensure that applicable standards, standard industry practices and regulatory requirements utilizing the following processes:

- Specification and procurement processes are in place and reviewed periodically.
- Operating, inspection and maintenance procedures including Health and Safety stipulations.

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- WHMIS assessments/product data sheets.
- Certification plans are in place and reviewed periodically.
- Information, instruction and training are current, available and reviewed.

9.9 ELEMENT 7: CONTINUOUS IMPROVEMENT (INCIDENT INVESTIGATION AND ANALYSIS, AUDITS, MEASUREMENT REVIEW AND IMPROVEMENT INITIATIVES):

A continuous improvement mechanism must be implemented to consistently evaluate the mechanisms and controls being utilized to achieve the key safety elements. The following are effective means of evaluating the key safety elements:

Audits and Assessments: Audits/assessments are often utilized as a prudent means to monitor compliance and help elevate continuous improvement. On the LCP, Project and Regulatory requirements will be audited periodically to ensure effective management. Audits, assessments, and performance review activities and systems are various means to assure compliance with both internally and externally imposed standards within the Project. Arrangements for audits and assessments will include the following:

- Audit programs that specifically address Health and Safety practices, policies and procedures that are in place and ensure they are followed.
- Audit scopes and frequencies are risk based.
- Audits are conducted by competent persons.
- Findings and actions are agreed with auditors and well documented.
- Audit results are communicated to the appropriate level of management.
- Lessons learned are shared with appropriate parties.

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- Audits will be carried out to regularly assess compliance with the elements of the Health and Safety Management Plan.
- Periodically, assess compliance with Health and Safety regulatory requirements will be evaluated.
- Audits may also be performed by personnel outside the Project, having Health and Safety expertise and auditing expertise.
- Auditors are identified, notified and involved in the planning and process to the appropriate level.
- Findings are properly communicated to auditors and to an appropriate level of Project management, along with any trends noted.
- Findings resulting from an audit are assessed, documented, prioritized and monitored until satisfactorily resolved.
- Audit entitlement/expectation is agreed with clients and documented in contract and interface documents.
- Properly constituted management reviews will be undertaken periodically.
- Effective Health and Safety audit procedures are in place to evaluate compliance with work procedures, work rules and permits for critical tasks/activities.

Audit Effectiveness: To ensure overall audit effectiveness, the following procedures, programs and follow-up must be in place:

- Documented Audit programs and defined schedules
- Auditing procedures and well defined protocols
- Auditor training program

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- Timely Audit reports, Responsible Individuals Assigned Actions (as appropriate), Target Dates for Completion and Follow-up
- Internal and external audits are conducted
- Periodic Review of Audits, Audit Trending and Communicating Trends to Management
- Interface documents
- Multi-faceted/disciplined teams to perform the audit.

Measurement and Review: Interfaces and relationships with clients and partners are critical for our overall Health and Safety performance. We will work closely with clients and partners to manage our roles and align expectations and goals. This will be further enhanced using the following:

- Leading and lagging Health and Safety indicators are measured, reviewed and used as input to generate improvement initiatives.
- Health and Safety feedback from all parties is used as input to improvement plans.
- Health and Safety driven management reviews are conducted periodically.
- Improvement plans include data from all available and applicable sources.
- Processes exist to manage Health and Safety improvement actions to completion.
- Health and Safety improvement plans are considered in the Project strategy process.

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10 MANAGING HEALTH AND SAFETY ON THE LOWER CHURCHILL PROJECT

Nalcor carries ultimate responsibility for Health and Safety Management and performance within the Lower Churchill Project. In terms of practical implementation of Health and Safety arrangements described in this Plan, the LCP Vice President expects his Management Team to take the lead in ensuring that all applicable arrangements are implemented within their areas of authority.

Nalcor Energy's Health and Safety Internal Responsibility System (IRS) is the cornerstone, which the Health and Safety Program is based. It is also a set of legal obligations for managing Occupational Health and Safety. The defining principle of the IRS is that everybody within the organization, from members of the Board of Directors to a temporary front line Employee, has a role and responsibility for Health and Safety. A second, and equally important principle is that solutions to Health and Safety issues in the workplace come from Employees themselves i.e. internal to the organization. While it is recognized that external assistance may sometimes be required (e.g. OH&S Branch of Government), it should be the exception rather than the rule.

An IRS works when:

- There is an unbroken chain of responsibility for Health and Safety flowing down through the organization and accountability for fulfilling Health and Safety obligations flows upward through the organization.
- Each Employee takes the initiative on Health and Safety issues, and works to solve problems and make improvements on an ongoing basis.
- Depending on their position within the organization, their qualifications and authority, each Employee accepts responsibility and accountability for their defined role.

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Figure 6 : Nalcor's Internal Responsibility System



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The Health and Safety function exists to provide the necessary support, advice and guidance in order to assist personnel on discharging their Health and Safety obligations. The Health and Safety function will also audit the Lower Churchill Project systems and activities to provide assurance that our Health and Safety implementation is compliant with applicable legislation or other relevant standards and improvement opportunities are identified and acted upon.

This Plan is built on the following Nalcor Energy commitments:

- The Nalcor Energy “Safety Credo” (Section 8.1)
- The Nalcor Energy “Guiding Principles” (Section 9.2)
- The Nalcor Energy “Core Elements” (Section 8, Figure 5)

10.1 HEALTH AND SAFETY MANAGEMENT INTERFACE

For MF, LTA and LITL, LCP Site Personnel will interface via daily, weekly and monthly meetings and stewardship sessions with the Project Delivery Team to ensure that:

- Health and Safety goals, objectives and scopes are fully understood and discussed by all management positions responsible for Health and Safety.
- The Project Delivery Team and all LCP personnel must clearly understand their roles and responsibilities for all Project activities.
- All Management personnel on the Project must clearly understand the processes and procedures linked to their areas of responsibilities.
- Joint construction and facility inspections must be conducted in an atmosphere of mutual cooperation to promote visible participation and endorsement of Health and Safety Plan Objectives whenever possible.
- The interface process must be reviewed on a periodic basis, and continuous improvement plans are formatted and implemented as and when required.

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For the Strait of Belle Isle (SOBI) Marine Crossing, the Contractor(s) executing the work will interface via daily, weekly and monthly meetings and stewardship sessions as warranted with the Project Delivery Team. The objectives of these interface sessions are as follows:

- Health and Safety goals and objectives, as well as work scope are fully understood and discussed by all management positions for Health and Safety.
- The Contractor(s) management personnel must clearly understand their roles and responsibilities for all Project activities, as well as the processes/procedures linked to their areas of responsibilities.
- Site inspections must be conducted periodically in an atmosphere of mutual cooperation to promote visible participation and an endorsement of Health and Safety Plan Objectives whenever possible.
- Plans for continuous improvement must be developed, implemented, and progress tracked periodically.

Upon completion of principal Construction, The critical phases of commissioning and RFO (Ready for Operations) will require that additional Health and Safety Roles and Responsibilities must be carried out to ensure safe transition from Construction to Operations. These include, but are not limited to, the following:

- Health and Safety Management Plan for RFO developed and communicated in advance of RFO Activities.
- Risk Assessments and Task Analysis are executed during commissioning phases.
- Emergency Response Planning and Drills (Training and Establishing Roles and Responsibilities with Operations during Transition Period)
- Develop Health and Safety Procedure for Handover to Operations Personnel with roles and responsibilities clearly defined.
- Ensure appropriate Health and Safety Resources are in place to provide adequate oversight.

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- Communications procedures must be developed, clearly defined and communicated to all affected parties.
- Ownership of process procedures must be clearly defined in a procedure.
- Post Testing Debriefs must be carried out, fully documented and maintained on file.
- Health and Safety Equipment for RFO must be clearly defined, purchased and available on Site in adequate timeframe to ensure coverage is 100% at minimum.

The following chart depicts how Health and Safety will interface with the Lower Churchill Project during three (3) distinctive Project Phases: **Engineering/Design/Procurement**, as well as the **Early Works Phase Construction**, and the **Construction Phase**. Health and Safety Management Plans for the Lower Churchill Falls Operation will be developed, communicated and implemented prior to project handover/operations.

Table 1 : Health and Safety Focus Areas during Principle Construction Phases

Engineering/ Design/ Procurement	Early Works Phase Construction	Construction Phase
<ul style="list-style-type: none"> • Health and Safety Planning Documents (Safety, Medical, Security, ERP) 	<ul style="list-style-type: none"> • Early Works- Health and Safety Plan – Site Plans 	<ul style="list-style-type: none"> • Construction Phase - Health and Safety Plan – Site Plan
<ul style="list-style-type: none"> • Constructability Reviews (per Component) 	<ul style="list-style-type: none"> • Risk Assessments 	<ul style="list-style-type: none"> • Logistics/Transportation Oversight
<ul style="list-style-type: none"> • Contract Evaluations/Input/ Procurement 	<ul style="list-style-type: none"> • Task Safety Analysis (TSA's) 	<ul style="list-style-type: none"> • Task Safety Analysis (TSA'S)
<ul style="list-style-type: none"> • Design Reviews 	<ul style="list-style-type: none"> • Emergency Response Planning/Training/Drills 	<ul style="list-style-type: none"> • Emergency Response Planning/Training/Drills.
<ul style="list-style-type: none"> • Risk Assessment Reviews- Confirm all Health and Safety Hazards/Risks are identified and mitigations are to be in place. 	<ul style="list-style-type: none"> • Oversight Audits and Inspections (worksites, security, medical, regulatory compliance) 	<ul style="list-style-type: none"> • Oversight Audits and Inspections

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Engineering/ Design/ Procurement	Early Works Phase Construction	Construction Phase
<ul style="list-style-type: none"> Contract Work Scope Development 	<ul style="list-style-type: none"> Health and Safety Training (Energy Isolation –Lock-out/Tag-Out; Confined Space; Step Back) 	<ul style="list-style-type: none"> Critical Lifts- Planning, Analysis, Execution
<ul style="list-style-type: none"> Risk Register 	<ul style="list-style-type: none"> Health and Safety Kick-off Meetings and Orientations 	<ul style="list-style-type: none"> Document Management
<ul style="list-style-type: none"> Training Plan 	<ul style="list-style-type: none"> Ensure all operations are meeting Nalcor LCP Standards 	<ul style="list-style-type: none"> Coaching
<ul style="list-style-type: none"> Equipment Selection and Procurement 	<ul style="list-style-type: none"> Logistics/Transportation Oversight. 	<ul style="list-style-type: none"> Health and Safety Training (Confined Space, Energy Isolation, Step-Back)
<ul style="list-style-type: none"> Establish High Level Health and Safety Performance Standards 	<ul style="list-style-type: none"> Establish High Level Health and Safety Performance Standards 	<ul style="list-style-type: none"> Establish High Level Health and Safety Performance Standards
<ul style="list-style-type: none"> Define Vulnerabilities in Design, Construction, Procedures and Mitigations 	<ul style="list-style-type: none"> Track incident trends and implement mitigation measures. 	<ul style="list-style-type: none"> Track incident trends and implement mitigation measures.

10.2 LOWER CHURCHILL PROJECT REQUIREMENTS- HEALTH AND SAFETY INTEGRATION

Health and Safety has been identified as a cornerstone of the overall Lower Churchill Project Requirements. It must be fully integrated into all phases of the project. Nalcor has elected to adopt the OHSAS 18000 (an internationally recognized ISO formatted standard for Occupational Health and Safety) as its standard for Health and Safety Policies, Procedures and Programs for the corporation and the Lower Churchill Project.

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The OHSAS methodology and requirements require full integration of Health and Safety into in all stages and aspects of the Lower Churchill Project. The Newfoundland and Labrador Occupational Health and Safety Act and associated regulations must always be considered as one of the documents to be consulted in support of the integration.

Effective planning for Health and Safety is essential if the LCP is to be delivered on schedule, without cost overrun, and without experiencing incidents or damaging the health of Site personnel. A focus on continuous review, oversight and improvement must be undertaken and maintained to ensure the flawless execution of this project. The following chart reflects how Health and Safety will be integrated into the Lower Churchill Project:

Figure 7 : Integrating Health and Safety with Lower Churchill Project Requirements



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10.3 HEALTH AND SAFETY ORGANIZATION – LOWER CHURCHILL PROJECT

The Health and Safety Organization within the Lower Churchill Project will be provided with the appropriate level of support throughout the course of the project. The overall responsibility for safety performance on the Project will be the responsibility of Nalcor Energy Corporation. However, Health and Safety support will engage the resources of all personnel to fully support through total buy in to the Project Standards, Programs, Policies and Procedures.

As noted on the organizational chart on the next page, the Health and Safety Organization will include Health and Safety professionals from Nalcor and Subcontractors. The Health and Safety Organization is made up of the following support functions and organizations:

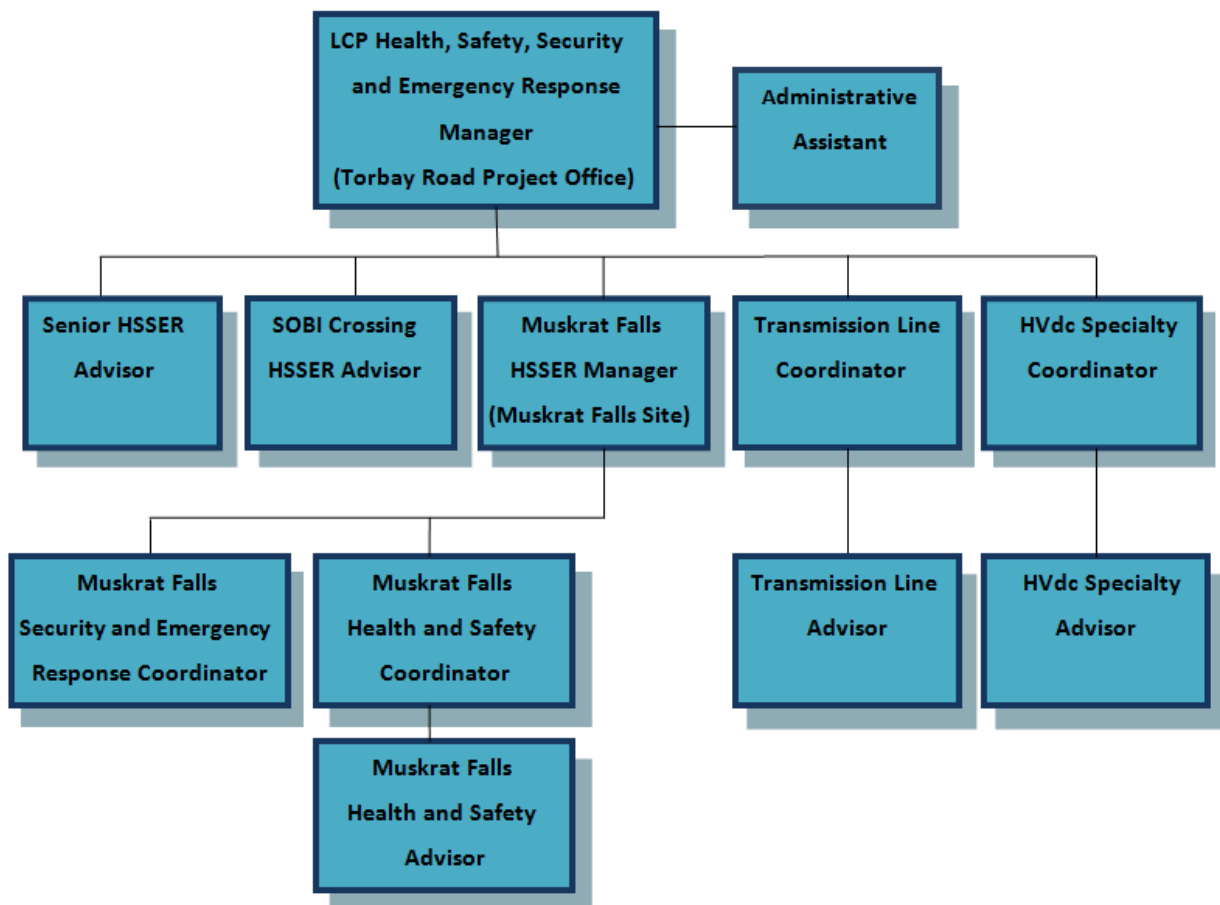
- The Project Delivery Team will have project oversight in terms of establishing governing corporate policies, procedures and programs. Corporate support includes oversight/auditing, policy and procedure development, health and safety initiatives and functional/directional support.
- The **Health, Safety, Security and Emergency Response (HSSER) Manager for the Lower Churchill Project**, located in St. Johns Torbay Road Office, will be providing functional support and expertise to the Project, as well as monitor and manage the overall Health and Safety direction of the Lower Churchill Project. The HSSER Manager also ensures consistency in direction, competencies, regulatory compliance, as well as implementation and application of Health and Safety policies, programs, procedures and strategies. The **LCP Senior HSSER Advisor** will report directly to the LCP HSSER Manager and will provide technical HSSER Support for the LCP, as and when required.
- The **Muskrat Falls Health, Safety, Security and Emergency Response Manager** (located at the Muskrat Falls Site) will report directly the Muskrat Falls Site Manager with a functional reporting to the LCP HES, Safety, Security and Emergency Response Manager. **The Muskrat Falls Health and Safety Coordinator** will be responsible for monitoring, tracking and reporting day to day activities at the Muskrat Falls Site and will have **Health and Safety Advisors** reporting to this

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position. The Muskrat Falls Security and Emergency Response Manager will report to the Muskrat Falls HSS and ER Manager and providing support to Transmission Line/Switchyard Activities and Operations as well.

- The **SOBI Crossing HSSER Advisor** will report directly to the SOBI Crossing Project Manager with functional support from the LCP HSSER Manager.
- The **Transmission Line/Switchyard HSSER Coordinator** will report to Component #3 and #4 Site Managers with functional support from the LCP HSS and ER Manager. This position will also manage and direct activities of the **Transmission/Switchyard Health and Safety Advisors**, who will provide on-Site Health and Safety Support.

Figure 8 : Health and Safety Organizational Chart



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11 CONTRACTOR MANAGEMENT

For onshore and offshore (where applicable for the SOBI work) construction, exploration and development operations, the work activities will be performed using contracted equipment and personnel. The competency and behaviour of the Contractors along with their integration into the operation as a whole can have a major impact on health, safety and environmental performance. Where applicable, LCP will ensure union management on Health and Safety are working cooperatively in the achievement of its vision. The Nalcor Energy - LCP will strive to engage reputable and fully qualified Contractors who have demonstrated an ability to conduct their activities in a manner consistent with the Nalcor Energy Health and Safety core elements as outlined above. The Lower Churchill Project has established certain minimum requirements and expectations that will ensure that Contractors conduct their activities in a safe and environmentally sound manner. These requirements form the basis of the Nalcor Energy guidelines and are conveyed to prospective Contractors during the bid process.

11.1 CONTRACTOR SELECTION CRITERIA

All Contractors are formally evaluated on their health, safety and environmental performance prior to awarding of a contract. To assist Nalcor Energy LCP in evaluating the quality and effectiveness of Contractors' Health and Safety management systems, each prospective Contractor will complete and submit, in support of the bid proposal, the Nalcor Energy LCP Bid Evaluation Questionnaire that provides an overview of the Contractors Health and Safety management system in terms of the following:

- Health and Safety Policy and commitment
- Management Involvement and Leadership
- Hazard Assessment and Risk Control
- Appropriate Safe Practices, Procedures and Rules

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- Training Program, including Orientation and Competency
- Communications/Health and Safety Meetings
- Incident Reporting, Investigation Policy and Analysis
- Regulatory Requirements/Compliance Plan
- Personal Protective Equipment (PPE) Policy and Program
- Environmental
- Emergency Preparedness
- Accident Statistics and Records
- Modified Work Programs/ Early Return to Work
- Maintenance Policy and Programs
- Substance Abuse and Testing and Accommodation Programs
- Subcontractor Management and Control Programs.
- OHS issued STOP Work, Non-Compliance Orders and/or Convictions for Violations of OHS Act/associated regulations.

11.2 CONTRACTOR HEALTH AND SAFETY PERFORMANCE MEASUREMENT

Details and frequencies of any monitoring, audits and review of Health and Safety Performance are contained in the Contractor's overall Performance Reporting Procedures and the Contractor's management systems.

Health and Safety statistics are prepared on a monthly basis by the Health and Safety Coordinator and forwarded to the Project Delivery Team for review. Additionally, a monthly update will be provided to the project management team, including the Contractor's workforce to provide feedback on Health and Safety Performance and facilitate opportunities for continuous improvement.

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The Lower Churchill Project will ensure the timely follow-up and completion of corrective actions identified through field inspections, audits, incident investigation and safety meetings. It is the responsibility of the Senior Manager on a Worksite or marine vessel to ensure that all corrective actions are implemented and closed out in a timely basis. It is the responsibility of the Contractor Health and Safety Manager to ensure that action items are traced for verification of close out. As and when necessary, the Project Delivery Team will coach and guide the Contractor in the delivery of the Project in order to achieve its Vision.

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APPENDIX A

RIGHTS AND RESPONSIBILITIES OF EMPLOYEES

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Appendix “A”- Rights and Responsibilities of Employees

Each and every employee has certain rights under provincial Occupational Health and Safety law, including:

- Right to Know about the hazards within their workplace - All persons have the right to know of any working condition that may in any way pose a health safety and environmental hazard or risk within the workplace; (e.g. WHMIS).
- Right to Refuse hazardous work - All personnel have the right to refuse work when they have reasonable grounds to believe that the work may be hazardous to them, to their fellow worker and to the facility/vessel.
- Right to Participate in the development, implementation and improvement of environmental health, and safety programs - All persons have the right to participate in identification and management of Health and Safety issues; e.g. JOHS Committee



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Right to Know

The Nalcor Energy-Lower Churchill Project, in cooperation with its major contractors, will use a variety of processes to ensure all employees, including contractors, sub-contracted employees and following consultants are informed of any hazards that may be present in the workplace. These programs include the following:

- Employee Training and Orientations
- Occupational Safety & Health Committees/Representatives
- Group Safety Meetings
- Task Based Job Safety Analyses
- Permit to Work System
- Onsite Emergency Drills
- Signage and Placards
- Safety Alerts and Bulletins

Additionally, applicable Health and Safety documents and relevant legislation including the Contractor Safety Plan will be made readily available to all personnel.

Right to Refuse

As per Section (45) of the Newfoundland and Labrador Occupational Health and Safety Act – Chapter O-3 (1992):

1. A worker may refuse to do work that the worker has reasonable grounds to believe is dangerous to his or her health or safety, or the health and safety of another person at the workplace:
 - a. Until remedial action has been taken by the employer to the worker's satisfaction;
 - b. Until the committee or worker health and safety representative has investigated the matter and advised the worker to return to work; or
 - c. Until an officer has investigated the matter and has advised the worker to return to work.
2. Where a worker refuses to do work under subsection (1) his or her employer may reassign the worker to other work that is reasonably equivalent to the work he or she normally performs and the worker shall accept the reassignment until he or she is able to return to work under subsection (1).

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3. Where a worker is reassigned to other work under subsection (2) the employer shall pay the worker the same wages or salary and grant him or her same benefits the worker would have received had the worker continued in his or her normal work.
4. Where a worker has reasonably refused to work under subsection (1) and has not been reassigned to other work under subsection (2) the employer shall pay the worker the same wages or salary and grant the worker the same benefits the worker would have received had the worker continued to work, until he or she is able to return to work under subsection (1).
5. A reassignment of work under subsection (2) is not discriminatory action under section

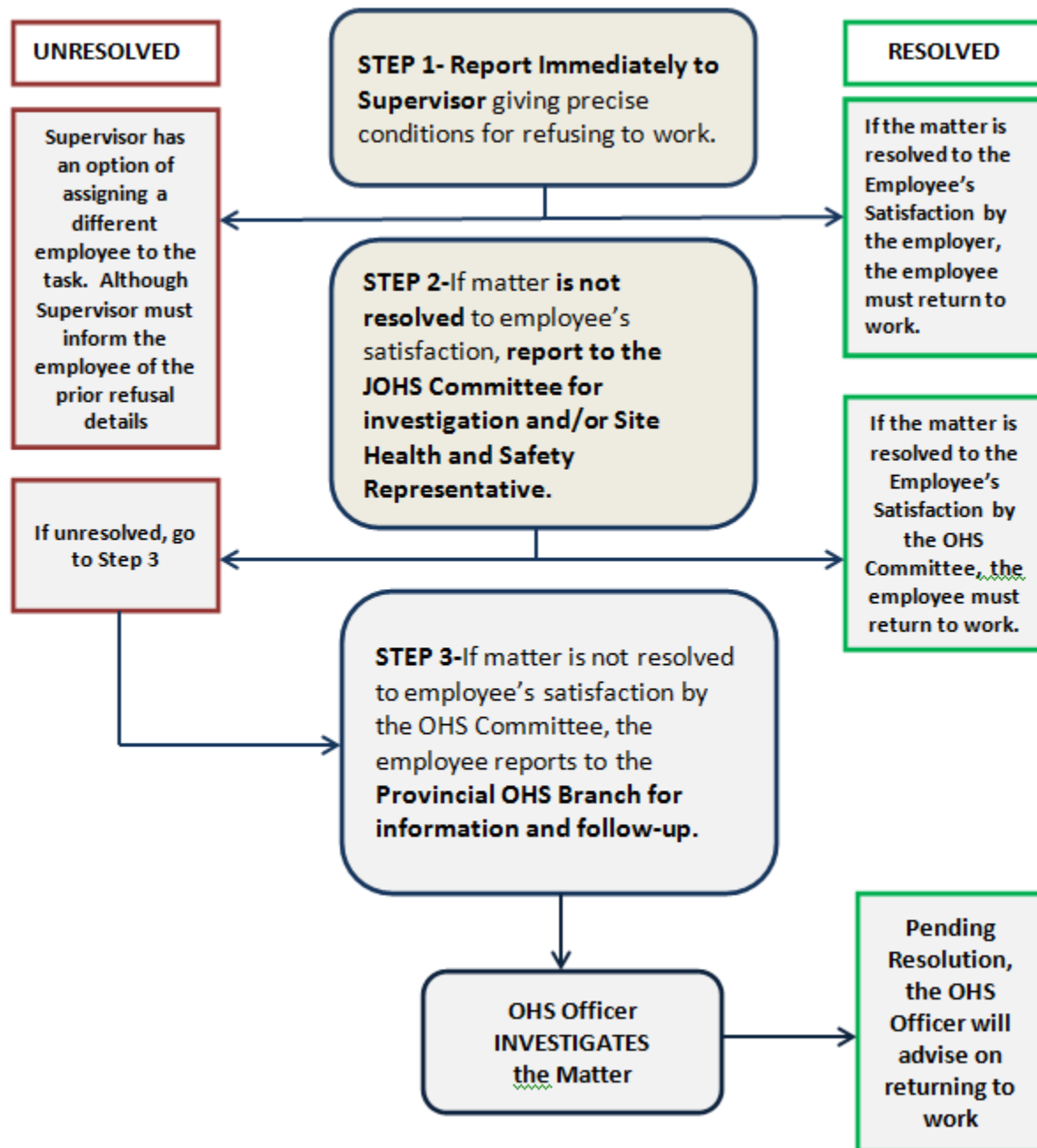
Discriminatory Action Prohibited

Section 49 of the Health and Safety Act of Newfoundland and Labrador states that an employer or union shall not take a discriminatory action against a worker by dismissing him or her or by deducting wages, salary or other benefits, or by taking other disciplinary action against him or her:

- Because of the worker's participation in or association with the committee, worker health and safety representative or workplace health and safety designate at the workplace, or because the worker is a worker health and safety representative or workplace health and safety designate;
- Because the worker has testified or is about to testify in a proceeding or inquiry under this Act or regulations;
- Because the worker has given information to the Workplace, Health, Safety and Compensation Commission, an officer or another person concerned with the administration of the Act or the regulations concerning the health, safety and welfare of workers at his or her workplace; or
- Because the worker has reasonably refused to work under his or her right to do so.

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Right to Refuse- Three Step Process For Resolution (as per OHS Act):



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Right to Participate (JOHS Committee)

Under PART IV of the OCCUPATIONAL HEALTH AND SAFETY REGULATIONS - COMMITTEES, REPRESENTATIVES AND DESIGNATES Section (25) identifies the Operations of committees, representatives and designates;

An employer shall ensure that:

- An occupational Health and Safety committee is established;
- a worker Health and Safety representative is appointed; or
- a workplace Health and Safety designate is designated; and
- a copy of the Act/ regulations under the Act are easily accessible.

Minutes of all regular meetings and special committee meetings shall be recorded in the form prescribed by the commission and one copy (1) shall be kept on file with the committee, one (1) copy shall be filed with the commission, one (1) copy shall be posted in a prominent place in the workplace and one (1) copy shall be forwarded to Nalcor Energy-Lower Churchill Project Health and Safety Group.

A worker Health and Safety Representative or a workplace Health and Safety designate shall report to the commission in the form required by the commission.

An occupational health and safety committee shall:

- Meet within two (2) weeks of its establishment
- Elect co-chairpersons as required by subsection 38(6) of the Act
- And notify the commission of the elected co-chairs

Health and Safety (JOHS) Committee

It is the policy of the Nalcor Energy-Lower Churchill Project, as well as a regulatory requirement to ensure that all personnel are provided an opportunity to be involved in EHS development and improvement efforts. Formal Health and Safety Committees provide leadership and direction for the Company and its business units and to allow for participation and input at all levels. The Health and Safety Committee structure is designed to establish positive, two-way communication throughout the organization and facility. The organization and function of the Health and Safety Committee shall be designed to meet the intent of applicable Newfoundland and Labrador legislation.

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The Committee shall:

- Consist of at least equal worker and management representation; Conduct meetings on a regular monthly basis or (every three (3) weeks for rotational crews where applicable)
- Prepare Committee meeting minutes and post minutes on the vessel or in onshore office bulletin boards for worker review and submit signed copies of these minutes to the Operator and the regulator
- Shall seek to identify aspects of the workplace that may be unhealthy and/or unsafe

In addition, as required under the Occupational Health and Safety Act and Associated Regulations, the Committee shall:

- Be notified and consulted where there is a likelihood that the safety or health of an employee is, or may be, endangered by exposure to a hazardous substance
- Be informed of all injuries and other “Hazardous Occurrences”
- Participate in incident investigations
- Have the right to accompany an officer of the division when health and safety inspections are being conducted

NOTE: During the Nalcor Energy-Lower Churchill Project all Safety Committees shall hold meetings on a monthly basis. If there are worker crews who change shift (e.g. every 3 weeks for rotational crews where applicable) each crew will have in place a safety committee.

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APPENDIX B

HEALTH AND SAFETY TRAINING

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Appendix “B”: Health and Safety Training

The following Health and Safety Training Opportunities will be provided to Employees, Consultants and Contractors to ensure core competencies are established and maintained.

Health and Safety Induction/Orientation

Prior to mobilization to any of the Lower Churchill Project work sites an Health and Safety Inductions/Orientations will be conducted for all LCP senior Management Personnel, Employees, Contractors, Subcontractor, Visitors and consultants. The Induction/Orientation shall provide an overview of the LCP and Contractor Health and Safety Programs and the Induction/Orientation will include the following:

- Project Overview
- Health and Safety Goals and Objectives
- Health and Safety Responsibilities
- Alcohol and Drug Policy
- Communications
- Training & Competency
- Hazard Identification and Reporting
- Personal Protective Equipment
- Site Specific Safety Policies
- Inspections and Audits
- Incident Reporting and Investigation
- Environmental Protection and Waste Management
- Emergency Preparedness
- Site Security

Informal Communications and Promotion

In addition to the induction and orientation, communication of Health and Safety Performance related information:

- Monthly Health and Safety Performance Updated
- Notices and Bulletins
- Safety Alerts
- Posters

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Personnel Qualifications Competency and Training

The Lower Churchill Project will ensure all project personnel are suitably qualified and trained as per the Contractor's "Training Matrix". The company training matrix will identify the training requirements for each position within the contractor's organization and will comply with Provincial and Federal legislative requirements and guidelines. Internal controls will be established by the Lower Churchill Project to ensure all appropriate personnel comply with the requirements and contractual arrangements and will require all contractors to cooperate in this effort.

Contractor's formal and in-house competency and training programs must consider the level of training required for the position and responsibilities of the personnel involved. The aim of their training programs is to provide an understanding of their procedures, equipment, risks and potential hazards that may occur. Details respecting Contractor's Competency and Training process shall be guided by the following:

- Selection and Control of Contractor Personnel;
- Competence Assessment and Records;
- Training;
- Induction Programs.

Health and Safety Training Matrix

Contractors will maintain independent training matrices which identifies the training requirements for each position in their respective organizations. The training matrix will be maintained up to date to ensure that personnel onshore/offshore have received the required regulatory and job specific training.

Service companies will be required to maintain a training matrix to ensure that all personnel who are working onshore/offshore on vessel are trained and competent in their positions. Training Matrices must be made available on work vessels (as appropriate) and at the worksites onshore/offshore.

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APPENDIX C

HAZARD IDENTIFICATION AND EVALUATION

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Appendix “C”: Hazard Identification and Evaluation

Job tasks will be reviewed and assessed for hazards/risks and risk management will be applied and utilized to reduce the risk as low as practicable. The following Nalcor risk methods and programs will be utilized on the Lower Churchill Project:

Be Safe Program



BeSafe is a behaviour-based safety program designed to develop skills in employees so that they can have respectful safety discussions with others. It is part of Nalcor’s second phase of a safety culture initiative aimed at strengthening personal responsibility for safety. It provides a standard conversational structure with which respectful discussions can occur around positive safety behaviours or potentially unsafe behaviours.

It allows employees to: Clearly and respectfully communicate safety concerns or observations, reinforce positive safety behaviours and engage in a collaborative problem solving approach to identify options to overcome potentially unsafe behaviours.

The objectives of the *BeSafe* program are to: understand key components of Nalcor’s Safety Culture including Personal Responsibility for Safety. understand what ***BeSafe*** is and why it is needed and practice ***BeSafe*** discussions.

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BeSafe is a 3-step process that provides guidance on safety conversations.

1. Say Something	B E S	Behaviour is the focus Express your observations Safety is the motivation
2. Discuss Options	A F	Acknowledge the other person's view Form an agreement
3. Express thanks	E	Express gratitude

Task Based Risk Assessment (TBRA)

The “Task Based Risk Assessment (TBRA)” will provide LCP personnel with guidance and information with respect to the assessment of risk associated with hazards that will be present in the activities of the Lower Churchill Project. A TBRA will be conducted and/or reviewed when the following circumstances apply:

- When a job is being undertaken for the first time and the risks are unknown
- For non-routine jobs or new jobs where experience is limited
- Any job that is intuitively deemed to be a high risk
- IF IN DOUBT- CARRY OUT A JOB SAFETY ASSESSMENT (TBRA)

During the planning and preparation phase, TBRA, including hazard identification and hazard analysis, will be conducted by a multi-discipline team that brings expertise and knowledge in Construction, Drilling, Engineering, Operations and Health and Safety. All contractors involved in Task Based Risk Assessments will follow their own Risk Matrix System if compatible and acceptable to the Lower Churchill and Nalcor Energy corporate “Tasked Based Risk Assessment” procedure. The identification of occupational work hazards will be conducted utilizing but not limited to the following guidelines:

- Hazard Identification
- Specific Hazard Assessment
- Identify Hazard Effect and who may be affected
- Identify Risk Rating

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- Identify Controls
- Review Residual Risk After Controls Are Applied
- Document and Record
- Approval to Proceed
- Permit to Work Systems
- Regular Site Inspections by the Contractor Health and Safety Personnel and
- Audit of compliance and effectiveness to Safety Management Systems periodically assisted or conducted by Lower Churchill Project Health and Safety Personnel.

The need for continual monitoring and identification of hazards both at the operations and management levels is recognized as important by Lower Churchill Project and Contractors. These systems are in place to ensure that all incidents are reported, the causes investigated, and any necessary amendments made to operating practices or training of personnel are detailed in the Health and Safety Management Systems.

All Health and Safety risks, including risks associated with change, must be identified and effectively managed. Task Based Risk Assessment identification includes evaluating and prioritizing risks utilizing the Lower Churchill Project Risk (or contracted company) matrix to establish a definitive overall risk characterization and then eliminating or controlling the risks. These systems confirm that there is a two-way flow of communication/information between all project personnel.

In addition to pre-tour meetings, toolbox/tailgate meetings, work permits, etc., a TBRA gives the crew performing a particular job the opportunity to formally identify the dangers and hazards associated with that job and also what potential injuries and/or damage could result from them. Further, it allows the crew performing that job to clearly communicate what is to be done in order to eliminate or isolate those dangers and hazards so the work can be completed safely. Wherever possible, an alternative means of accomplishing the activity that removes the risk entirely shall be sought.

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Inspections and Audits

Lower Churchill Project Inspections and Audits shall be conducted on the contractors to identify potential health and safety issues. The purpose of the inspection and audit process is to:

- Identify and correct actual or potential hazards;
- Ensure continued compliance with regulations and company standards;

The following is a summary of potential inspections/audits for the marine vessels and equipment:

- Transport Canada Inspections;
- Classifications Survey;
- Nalcor Energy-Lower Churchill Project Inspections and Audits.

A Health and Safety Inspection Checklist is included in Appendix “O”

Behavioural Based Safety Program

A Behavioural Based Safety Program is a tool used to continuously improve safety performance through the identification, observation and reduction of at-risk behaviours and the elimination of incidents. Contractors who have these programs in place will use their programs to enhance overall safety performance in the work place (e.g. STOP, etc.). These programs shall be similar to the Lower Churchill Project and Nalcor Energy Corporate “Safe Workplace Observation Program (SWOP) (see it – fix it – report it)”. This tool is for all employees to use when identifying or observing hazards in the work place. The workers shall immediately correct and/or report potential hazards to their immediate supervisors and shall use the Nalcor Energy-Lower Churchill Project SWOP program or the contractor’s similar booklet to record the hazard observation and actions taken to mitigate such hazards.

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The Lower Churchill Project has a goal of becoming a safety leader. One of the key components in achieving “best in class” safety performance is a well developed system for the reporting, review, and analysis of sub standard conditions and practices (acts) as well as loss and “near miss” incidents.

The Safe Workplace Observation Program (SWOP) has been designed with a simple concept in mind: If an individual sees something that does not appear to be safe, if appropriate, they must take immediate action to correct it and then report the situation to their Supervisor for follow-up.

By reporting your “Observations” an individual will be helping to ensure that the conditions, practices (acts), or situations that create hazards in the workplace are identified, analyzed, and corrected before a significant loss can occur.

Since it is also important to recognize when something is done well, SWOP also has a commendation component to recognize the importance of celebrating successful safety performance.

Permit to Work (PTW)

Nalcor Energy-Lower Churchill Project takes into consideration that contractors will operate their business aspects at the work site and will require contractors to employ a permit to work system.

A “Permit to Work” system is a formal written system which provides a means of managing non-routine and higher risk tasks and activities. The permit to work procedures provide a method for supervisors and crew members to follow when undertaking certain types of tasks recognized to generate particular exposures to personnel or the site. The PTW system also furnishes management a formal method to administratively

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coordinate and control work that may adversely impact other concurrent work, impair safety systems or otherwise endanger personnel at the work site. The permit to work also provides a means of formal communications between personnel involved with the permitted job and those personnel that may be affected by it, and supervisors who have influence on how, when and where the work is done. The PTW system shall:

- Limit the scope of the task;
- Ensure supervisors and crew members follow procedures, are well informed, understand and follow the applicable safety precautions and recognize the need for and use of required safety equipment; (E.g. Personal Protective Equipment)
- Control the work within specified time limits;
- Encourage pre-task planning in order to minimize risk to personnel at the work site, and reducing the inconvenience and interference to other operations/activities as well as reduce any adverse impact;
- Enhance awareness of personnel responsible for overall safety by providing documented details of any known risks, of potentially hazardous activities in progress and appropriate mitigating measures;
- Provide a continuous control and record of ongoing work activities, detailing the nature of the work, required precautions/safeguards, and the responsible competent person in charge, this control and recording will be identified in a detailed “Permit to Work” system/process;
- Ensure that upon completion of work, equipment and site are left in a fully operable state, as well as a tidy and safe condition; and
- Provide formal notification of completion of all work to the Person in Charge (PIC). This notification is a part of a “Permit to Work” system/process.

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The issue of a permit to work does not, by itself, make a job safe. A permit to work is not simply permission to carry out a potentially hazardous task, but a critical communications and training tool for all affected personnel. It is part of a clearly defined system which assists in determining how a job can be performed safely; precautions that may need to be taken; specific procedures to safely perform the task; and ways to reduce the risk and hazards related to specific tasks. In accordance with Health and Safety Procedures, the use of permits is mandatory for certain operations; these include but are not limited to the following:

- Pressurized systems where there is a possibility of pressure release;
- Any marine vessel work performing over the side work;
- Hot/Cold work;
- Entry into confined space;
- Working on or isolating mechanical, pneumatic or electrical equipment;
- Any diving activities;
- Work involving handling of dangerous materials such as explosives etc.; and
- Heavy lifts.

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All new personnel shall receive induction and awareness training on the PTW and contractor JRS where applicable or the Lower Churchill Project TRSA process if required.

Incident Investigation and Reporting

The Lower Churchill Project is committed to providing a safe and healthy workplace for its Employees, Contractor Personnel, Subcontractor Personnel, Vendors and the general public. Safety is our No. 1 priority and it is one of the Company's seven (7) core values. Nalcor is committed to ***Zero Harm – Nobody Gets Hurt***. We believe this is both achievable and sustainable, while we each have a personal responsibility for safety. The incident management plan must reflect the uniqueness/specifics of the work to be carried out and associated work locations.

Every Accident/Incident is a combination of causes. The Lower Churchill Project through the application of our Health and Safety Management system will endeavour to prevent incidents from occurring. The Lower Churchill Project encourages a culture where accidents/incidents are reported without prejudice. The Lower Churchill Project's Health and Safety Management system will be used to identify and report all accidents/incidents that occur in the workplace. In the event that an accident/incident does occur it will be investigated to the extent required to determine the basic and root cause and to effect appropriate corrective actions.

Accident/Incident investigations will be initiated as promptly as possible. The findings of the investigations will be documented and appropriate recommendation(s) will be developed and communicated to prevent recurrence of similar or other incidents. The appropriate ensuring recommendations will be assigned to an individual/position and implemented. All decisions and actions will be communicated.

Any accident/incident that could have resulted in significant injury or property damage (near miss) and all incidents that result in injury or property damage (including spills) will be investigated.

Accidents/Incidents (A/I) Investigations

Accidents and Incidents that must be investigated include the following:

- Fatalities
- Lost Time
- Medical Aid
- Vehicle Accidents/Incidents
- Fires and Explosions

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- Chemical and Pollutant Spills
- High Potential Near Miss incident

All employees are required to report any and all accidents/incidents/near miss incidents/spill hazard to their immediate Supervisor immediately. The supervisor will discuss the occurrence with the reporter in order to determine corrective actions. The Supervisor will immediately report the accident/incident/near miss incident/spill hazard to his Manager who will in turn report to the Lower Churchill Project representative on site immediately or within a 24 hour period of being notified of the incident. A final written A/I report shall be forwarded to the Lower Churchill Project representative no later than 14 days after the initial report was made. The A/I report shall identify the basic and root causes, recommendations and responsible person to ensure that recommendations and actions are completed and closed. The Contractors/sub-Contractors shall ensure that mitigations are taken and ensure that such incidents may never re-occur.

Accident/Incident Regulatory Reporting Requirements

Under Section 54 of the Newfoundland and Labrador Health and Safety Acts and Regulations requirements:

1. Where an accident takes place at a workplace:
 - That results in serious injury to a person or results in the death of a person; or
 - That had, or continues to have, the reasonable potential of causing serious injury to or the death of a person

The employer, or principal contractor shall immediately notify the Assistant Deputy Minister of the accident by reporting through the 24 Hour Accident Reporting Line (709) 729-4444.

2. Where an accident is reported under subsection (1), notification shall immediately be given to the committee, the worker health and safety representative or the workplace health and safety designate.

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APPENDIX D

CHANGES AND MODIFICATIONS TO PROCEDURES AND EQUIPMENT

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Appendix “D”: Changes and Modifications to Procedures and Equipment

Modification of Contractors Procedures and or Personnel

Changes and modification applies to changes to programs, procedures, equipment and organizational structure, which may impact the health, safety, environment and financial wellbeing of the project. To better manage and control significant and/or major changes to or within the organization or contracted companies may require a more formal approach to accomplish the desired changes efficiently (e.g. Change Management). Such changes shall be reviewed through the Task Based Risk Assessment process, as any significant and critical changes should be subjected to an analysis, assessment and communication process.

Contractor Equipment Modification

Where significant modification are intended, it is the responsibility of the contractor to ensure that changes process is followed and a formal approval process is initiated for any significant equipment modifications. Depending upon the degree of modification requested a certifying authority’s approval may be required.

Equipment Fitness for Purpose

Any equipment used within the Lower Churchill Project, where applicable, shall have a Certificate of Fitness (CoF) for the area of operations. The contractor shall ensure that equipment complies with any regulatory requirements and industry standards and maintained. For example if a marine vessel is to be used on the Lower Churchill Project it shall meet all Transport Canada classification requirements, either costal trade or ocean going. Any equipment on the vessel that is not under the jurisdiction of Transport Canada may be certified by a certifying company (e.g. DnV). All certificates for vessels/equipment must be made available on the vessel or equipment used onshore must have a current safety inspection certificate and be made available for review.

The Lower Churchill Project will ensure that all Contractor equipment is fit for purpose. Only appropriately certified equipment will be used. If proper certification does not arrive with the equipment, the equipment will not be put into service until such time as verification can be made.

Any additional HS critical equipment requires appropriate certification prior to use (e.g. pressure vessels, materials handling equipment and lifting gear). It is the responsibility of the Contractor to ensure that any such additional equipment is fit for purpose and safe to use prior to commencing service.

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All lifting equipment (e.g. lifting slings, shackles, pad-eyes, etc.) is visually inspected by a competent person from the contractor prior to use and certified by a qualified 3rd party at least semi-annually. Certification certificates must be at the work site for review by the Lower Churchill Project personnel. A color coding system shall be in place for the purpose of identifying dates for inspection and/or testing. All Kevlar slings must be kept stowed in a secure area of the Tool Room and shall be used for specific uses only and visually inspected prior to each use and again before returning to the Tool Room.

The Lower Churchill Project will foster recognition and agreement from all contractors that reliance on the certification process alone is not sufficient to reduce operational risk of equipment design and construction to “As Low As Reasonably Practicable” (ALARP), and that this requires the personal, active, and visible involvement and participation of all workers and management at all levels.

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APPENDIX E

WORK STANDARDS, PRACTICES AND PROCEDURES

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Appendix “E”: Work Standards, Practices and Procedures

The work standards, practices and procedures described in this section are designed to reduce the likelihood of accidents/incidents in the workplace and are consistent with the Lower Churchill Project safety policies and procedures, safety management principles and legislative requirements. This section does not, however, cover all aspects of safety and special circumstances that may arise which will require professional judgment and common sense.

Occupational Health Hazards

The occupational health hazards most commonly encountered in worksite operations include the following:

- **Chemical Hazards** - Hazards resulting from harmful exposure to hazardous chemicals stored, handled or used in the workplace.
- **Illumination Hazards** - Hazards resulting from prolonged exposure to inadequate levels of lighting.
- **Radiation Hazards** - These are hazards resulting from exposure to harmful levels of ionizing and non-ionizing radiation.
- **Biological Hazards** - These are hazards resulting from exposure to living organisms such as viruses, bacteria, fungi and parasites.

Control of Occupational Hazards

The following engineering and administrative controls, safe work practices and personal protective equipment will be used to control exposure to occupational health hazards:

Chemical Hazards

As per the Canadian Federal requirements all worker working in a work place that will be exposed to or working in close proximity to Chemicals and Controlled products will have completed training in Workplace Hazardous Materials Information System (WHMIS), or equivalent training.

Ergonomics Hazards

Ergonomics is the practice of fitting workplace conditions and job demands to the capabilities of the working population. Simply put it is matching the work to the worker.

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Ergonomic hazards refer to workplace conditions that pose the risk of injury to the musculoskeletal system of the worker. Examples of musculoskeletal injuries include:

- Tennis elbow: an inflammation of a tendon in the elbow
- Carpal tunnel syndrome: a condition affecting the hand and wrist

Ergonomic hazards include repetitive and forceful movements, vibration, temperature extremes and awkward postures (that arise from improper work methods and improperly designed workstations, tools and equipment). Ergonomic issues are often a factor of work station design, repetitive work activity, improper lifting and reaching.

Heat Stress Hazards:

When a worker is exposed to extreme heat, a qualified person shall measure and record the conditions at frequent intervals. When a worker is exposed to extreme heat, that worker shall be instructed by a competent person on the symptoms of heat stress and the precautions to be taken to avoid injury from heat stress.

Cold Stress Hazards

When a worker is exposed to extremely cold temperatures, a qualified person shall measure and record the conditions at frequent intervals. When a worker is exposed to extreme cold, that worker shall be instructed by a qualified person on the symptoms of cold stress and the precautions to be taken to avoid injury from cold stress. For further information, refer to Appendix “F” which discusses PPE requirements for extreme cold weather conditions.

Noise Hazards

Where sound levels in a space exceed 85 dB, the entrance(s) to that space will be fitted with a sign identifying it as a “High Noise Area”. The maximum time exposure of a worker in that space will not exceed the limits prescribed the American Conference of Governmental Industrial Hygienists Threshold Level Booklet. Where it is not reasonable or practicable to maintain the prescribed limits, appropriate hearing protection will be used.

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Illumination Hazards

All lighting systems, including emergency lighting, must be properly maintained. Adequate illumination shall be provided in all working areas, taking into consideration the nature of the work involved and the accepted standards of quantity and quality of light requirements. In an emergency situation when failure of the normal lighting system might constitute danger to a worker's health or safety, emergency lighting independent of the normal lighting source shall be available and tested on a regular basis to ensure that it will function in an emergency.

Where ambient lighting levels are not suitable for a particular job/task then additional lighting shall be procured.

Radiation Hazards

Storage, handling and use of radioactive substances will be licensed by the Canadian Nuclear Safety Commission. The amount of radioactive substances will be kept at a minimum stock necessary to carry out operations, and will be stored away from accommodation areas and passageways in a steel weather-proof container that is properly labelled.

Vibrational Hazards

Constant exposure to vibration has been known to cause serious health problems such as back pain, carpal tunnel syndrome, and vascular disorders. Vibration related injury is especially prevalent in occupations that require outdoor work, such as forestry, farming, transportation, shipping, and construction. There are two classifications for vibration exposure: whole-body vibration and hand and arm vibration. These two types of vibration have different sources, affect different areas of the body, and produce different symptoms.

Whole-body vibration is vibration transmitted to the entire body via the seat or the feet, or both, often through driving or riding in motor vehicles (including fork trucks and off-road vehicles) or through standing on vibrating floors (e.g., near power presses in a stamping plant or near shakeout equipment in a foundry).

Hand and arm vibration, on the other hand, is limited to the hands and arms and usually results from the use of power hand tools (e.g., screwdrivers, nutrunners, grinders, jackhammers, and chippers) and from vehicle controls.

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Occupational health effects of vibration result from extended periods of contact between a worker and the vibrating surface. Potential health effects of chronic whole-body vibration and hand and arm vibration exposure include the following:

- Whole-body Vibration: Back pain
- Hand and Arm Vibration: Decreased grip strength; Decreased hand sensation and dexterity; Finger blanching or “white fingers”; Carpal tunnel syndrome

Biological Hazards

Hygiene inspections will be conducted of accommodation areas, including food storage and preparation areas, where applicable.

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APPENDIX F

PERSONAL PROTECTIVE EQUIPMENT

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Appendix “F”: Personal Protective Equipment

All persons working on the LCP including visitors, will be required to use personal protective equipment (PPE) that is appropriate for the work being performed and the nature of the hazards involved. No person will be permitted to enter an area, or perform any work, where personal protection is required unless that person is correctly attired with the necessary protective clothing or equipment.

All personnel on site will be required to wear standard PPE (i.e., hard hat (with side impact protection), safety boots, high-visibility safety vest, and safety glasses meeting requirements noted below). With respect to the requirements for additional PPE, a risk assessment will be carried out prior to work commencement to determine additional PPE requirements considering site conditions, the nature of the work activity and associated safety risks.

Nalcor Energy requires contractors to ensure that their personnel are instructed in the proper use and care of that equipment.

Cold Temperature Clothing

Clothing must be suitable for the working conditions and must provide protection for low temperatures, high wind velocities and the resulting wind chill factors. The following chart is for determining wind chill factors:

		Air Temperature (Celsius)																
		0	-1	-2	-3	-4	-5	-10	-15	-20	-25	-30	-35	-40	-45	-50	-55	-60
Wind Speed (km/hr)	6	-2	-3	-4	-5	-7	-8	-14	-19	-25	-31	-37	-42	-48	-54	-60	-65	-71
	8	-3	-4	-5	-6	-7	-9	-14	-20	-26	-32	-38	-44	-50	-56	-61	-67	-73
	10	-3	-5	-6	-7	-8	-9	-15	-21	-27	-33	-39	-45	-51	-57	-63	-69	-75
	15	-4	-6	-7	-8	-9	-11	-17	-23	-29	-35	-41	-48	-54	-60	-66	-72	-78
	20	-5	-7	-8	-9	-10	-12	-18	-24	-30	-37	-43	-49	-56	-62	-68	-75	-81
	25	-6	-7	-8	-10	-11	-12	-19	-25	-32	-38	-44	-51	-57	-64	-70	-77	-83
	30	-6	-8	-9	-10	-12	-13	-20	-26	-33	-39	-46	-52	-59	-65	-72	-78	-85
	35	-7	-8	-10	-11	-12	-14	-20	-27	-33	-40	-47	-53	-60	-66	-73	-80	-86
	40	-7	-9	-10	-11	-13	-14	-21	-27	-34	-41	-48	-54	-61	-68	-74	-81	-88
	45	-8	-9	-10	-12	-13	-15	-21	-28	-35	-42	-48	-55	-62	-69	-75	-82	-89
	50	-8	-10	-11	-12	-14	-15	-22	-29	-35	-42	-49	-56	-63	-69	-76	-83	-90
	55	-8	-10	-11	-13	-14	-15	-22	-29	-36	-43	-50	-57	-63	-70	-77	-84	-91
	60	-9	-10	-12	-13	-14	-16	-23	-30	-36	-43	-50	-57	-64	-71	-78	-85	-92
	65	-9	-10	-12	-13	-15	-16	-23	-30	-37	-44	-51	-58	-65	-72	-79	-86	-93
	70	-9	-11	-12	-14	-15	-16	-23	-30	-37	-44	-51	-58	-65	-72	-80	-87	-94
	75	-10	-11	-12	-14	-15	-17	-24	-31	-38	-45	-52	-59	-66	-73	-80	-87	-94
	80	-10	-11	-13	-14	-15	-17	-24	-31	-38	-45	-52	-60	-67	-74	-81	-88	-95
85	-10	-11	-13	-14	-16	-17	-24	-31	-39	-46	-53	-60	-67	-74	-81	-89	-96	
90	-10	-12	-13	-15	-16	-17	-25	-32	-39	-46	-53	-61	-68	-75	-82	-89	-96	
95	-10	-12	-13	-15	-16	-18	-25	-32	-39	-47	-54	-61	-68	-75	-83	-90	-97	
100	-11	-12	-14	-15	-16	-18	-25	-32	-40	-47	-54	-61	-69	-76	-83	-90	-98	
105	-11	-12	-14	-15	-17	-18	-25	-33	-40	-47	-55	-62	-69	-76	-84	-91	-98	
110	-11	-12	-14	-15	-17	-18	-26	-33	-40	-48	-55	-62	-70	-77	-84	-91	-99	
		0 to -10 Low			-10 to -25 Moderate			-25 to -45 Cold			-45 to -59 Extreme			-60 Plus very Extreme				

High Visibility Vests, Coats, Shirts, Jackets on the work site must be compliant with the most current CSA Z96.1 standard.

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All personnel working near “energized” electrical equipment or transmissions lines shall wear Fire Retardant Coveralls (Nomex or equivalent). All coveralls must be equipped with high visibility materials/reflective stripping as per the latest CSA Z-96.1 standard.

When construction site personnel are exposed to the hazard of moving vehicles or heavy equipment, they shall wear distinguishing apparel containing highly visible material suitable for daytime or night time use. Work Vests, Coveralls or Jackets must be equipped high visibility, reflective striping as per CSA Standard- Z 96.1, “Guideline on the Selection, Care and use of High-Visibility Safety Apparel (HVSA).”

Protective Headwear

Protective hard hats are designed to protect the wearers’ head from impact (including side impact) and penetration of falling objects. All personnel will ensure that their industrial protective headwear meets the design standards set out in CSA Standard CAN/CSA Z94.1-92 will be worn when outside offices and other exempt areas. Hardhat liners or other apparel suitable to protect the neck and head from cold injury must be worn with the hardhat in extreme cold. All hard hats must be provided with side impact protection.

Protective Footwear

Protective footwear that meets the design standards set out in CSA Standard CAN/CSA Z195-02 (Green Triangle) will be worn when outside offices and other exempt areas. Safety boots must have Grade 1 Toe Protection. Those personnel working in and around electrical power generation and transmission links must wear electrically resistive safety boots (Orange Omega Symbol) In terrain conditions where there is a risk of ankle injury or falls, footwear with ankle support (between 6 and 8 inches boot height) and aggressive treads must be worn on the site.

Eye and Face Protection

Eye and face protective equipment that meets the design standards set out in CSA Standard CAN/CSA Z94.3.1 will be worn where there is a potential for an injury to the eyes, face, ears or front of the neck. Industrial safety glasses with permanent side shields will be worn when outside offices and other exempt areas. Plastic Lenses must be treated to block UV rays. Safety glasses must have non-conductive frames. CSA approved safety eyewear is required at all times on work sites, except in vehicles and camp facilities.

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The minimum standard for eye protection is CSA approved safety glasses with fixed side shields. Full-face shields, mono goggles or other types of eye protection must be worn when safety glasses are not adequate to protect from impacts (i.e. grinding, abrasive blasting etc.).

Contact lenses should not be worn in areas where dust is common or strong chemicals are used. Where there is a potential for chemical or particulate exposure to the eyes, ensure an appropriate portable eye-wash system, capable of delivering approximately 0.4 gallons per minute for at least 15 minutes, is readily available. Safety goggles face shields or glasses with side shields are also required to be worn to protect from splashes or particle projectiles. Contact lenses should always be removed to adequately flush foreign substances from the eyes.

Prescription vision correcting eyeglasses must be CSA approved safety glasses with rigid side shields or worn under approved safety glasses.

Hearing Protection

Hearing protection must meet the design standards set out in CSA Standard Z94.2- (latest edition) will be used where sound levels exceed 85 db(A). CSA Standard Z94.2 94 hearing protectors such as earmuffs or earplugs will be available and worn in high noise areas (above 85 dB (A) or whenever there is a risk of hearing impairment. Workers should be made aware of their reduced ability to hear warnings and noises when wearing ear protection.

A contractor whose workers will be exposed to noise levels at or in excess of 85 dB(A) must have a hearing conservation program. The plan will address how workers will be monitored and protected from excess noises.

Hand Protection

Gloves suited for the work will be worn to protect against cuts, burns, electricity, chemicals and exposure (heat or cold) to the elements. In most cases, cotton work gloves suitable for visitors/inspectors to the work site. For material and equipment handling tasks, leather palmed gloves must be worn to provide adequate hand protection. For handling chemicals or hydrocarbon products, chemical resistant gloves must be worn. For any question regarding types of gloves for a particular task, the supervisor or safety representative should be contacted.

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Skin Protection

An apron, full-face shield and rubber gauntlet-style gloves will be provided to every person required to handle caustic soda, acids or other corrosive products. Barrier creams or lotions will be provided to workers who may experience a rash on their skin from chemical irritants.

Fall Protection

Every person will use fall protection equipment that meets the design standards set out in CSA Standards Z259 family of standards as prescribed in the OHS Regulations concerning fall protection. CSA Standards identified in this section on fall protection are also referenced in the OHS Regulations concerning fall protection.

Fall protection systems may include barricades, guard rails, work platforms and scaffolding. Contractors must use fall protection to protect themselves from falling. In addition, personal fall restraint and arrest systems will be used where necessary. All workers utilizing fall protection systems are required to complete a training program on fall protection as prescribed by the commission (WHSCC).

Ensure that systems are designed and constructed as per regulatory requirements. Ensure temporary structures are inspected prior to use, regularly during use and when transferred.

Ensure all fall arrest systems, devices and procedures comply with regulatory requirements.

Ensure workers who will use fall protection systems are competent and adequately trained in fall protection systems (i.e. hazards, use, limitations, inspections etc.). The Newfoundland OHS Regulations require that all workers required to utilize fall protection equipment must complete a training program on fall protection as prescribed by the WHSCC. Ensure workers have reviewed the fall protection rescue plan and signed off to ensure they understand it.

Fall restraint systems must be used when working above, over moving machinery or over water where, due to temperature or depth, or current movement, self-rescue is difficult or impossible.

Ensure lifelines optimize connection points for workers' personal fall-arrest devices.

Ensure workers connect lanyards so that the maximum free fall is restricted to 1.2m or otherwise prescribed in current regulatory requirements. Position personnel to prevent pendulum swing falls

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Part of the harness system is two shock absorbing lanyards with locking snaps. Ensure the shock-absorber end is always connected to the safety harness. It is recommended that a full body harness with two shock absorbing lanyards attached to the back “D” ring is worn. (NOTE: Fall arrest systems may have various applications during the course of the project and their configurations could be different from what is recommended above. Any deviations to the system noted above should be approved by the LCP Muskrat Falls Health and Safety Manager or LCP Muskrat Falls Health and Safety Manager or Coordinator.)

Ensure anchoring points meet the health and safety requirements.

A subcontractor whose workers are exposed to the risk of falling must have a fall protection plan for the work. The plan must assess the fall hazards, fall protection and maintenance of fall protection equipment and the plan must be communicated with all workers at the job site.

Drowning Protection

All personnel working near or over the water are required to wear a personal flotation device meeting CAN/CGSB – 65-CCP-14M. Additionally, all personnel who work over-the-side of a marine vessel or in an area where there is a danger of falling overboard will be required to use a life jacket or personal floatation device that meets the design standards set by the Canadian General Standards Board and the Canadian Shipping Act and Regulations. The floatation device must meet the CGSB Standard CAN/CGSB 65.11-M88 or equivalent.

Respiratory Protection

In areas or spaces where there is a hazard of an airborne hazardous substance or an oxygen deficient atmosphere, respiratory protection equipment that is listed in the NIOSH Certified Equipment List will be required. Training will be provided specific to the equipment to be used prior to actual usage. Respiratory Protection must be CSA approved and meet the requirements of CSA Z94.4. (Selection, Use and Care of Respirators). Reference should be made to OHS Regulations s.83, s84, s85 and s86 pertaining to respiratory protection for additional guidance and clarification.

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APPENDIX G

WORKING IN COLD ENVIRONMENTS

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Appendix “G”: Working in Cold Environments

The ability of workers to function and work normally in cold environments is affected by the degree and extent of exposure to sub-zero conditions. Additional precautions must be considered with regard to using lifting equipment in extreme cold temperatures.

Contractors must be adequately prepared to ensure personnel are not put at risk due to exposure to cold conditions. The following standards must be followed when personnel are required to work in cold conditions. The changes to human performance under such conditions are due to two main factors:

1. The environmental temperature
2. The clothing required to maintain a safe core body temperature and to fully function in the environment in the execution of an assigned task.

Cold Safe Work Standards

Rest breaks must be planned for and utilized to allow workers to warm up particularly their extremities. These breaks should not be less than ten (10) minutes in length and should be taken in a heated area. Outer clothing should be removed to prevent overheating and sweating when in the heated area. Returning to cold work while damp or sweaty may result in rapid chilling. The following recommended work practices should be followed:

Under conditions of continuous work in the cold:

- Heated warming shelters (i.e. bus, vehicles) should be provided. Workers should be encouraged to use these at regular intervals, the frequency of use depending on the severity of environmental exposure.
- When entering the heated shelter, outer and middle clothing layers (as necessary) should be removed to prevent overheating and to permit dampness to evaporate. A change of dry clothing may be necessary.
- Warm fluids should be consumed at the work site to provide energy, warmth, and replace fluids lost during work. Significant fluid loss can occur in the cold due to sensible and insensible sweating,

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breathing, and the extra energy requirements of working in the cold. Dehydration in the cold is a serious concern, increasing a worker's susceptibility to hypothermia.

- The onset of severe shivering, the feeling of excessive fatigue, drowsiness, irritability or euphoria are indications for immediate return to the shelter.

Warm up Schedule for Cold Temperatures

(Threshold Limit Values for Work and Warm-up Schedule for 4 Hour Shift)

AIR TEMPERATURE SUNNY SKY		NO NOTICEABLE WIND		8 KPH WIND		16 KPH WIND		24 KPH WIND		32 KPH WIND	
°C	°F	Max. Work Period	No. of Breaks	Max. Work Period	No. of Breaks	Max. Work Period	No. of Breaks	Max. Work Period	No. of Breaks	Max. Work Period	No. of Breaks
-26° to - 28°	-15° to -19°	Normal work hours and break periods	1	Normal work hours and break periods	1	75 min.	2	55 min.	3	40 min.	4
-29° to -31°	-20° to -24°	Normal work hours and break periods	1	75 min.	2	55 min.	3	40 min.	4	30 min.	5
-32° to -34°	-25° to - 29°	75 min.	2	55 min.	3	40 min.	4	30 min.	5	Non-emergency work should cease	
-35° to - 37°	-30° to -34°	55 min.	3	40 min.	4	30 min.	5	Non-emergency work should cease			
-38° to - 39°	-35° to -39°	40 min.	4	30 min.	5	Non-emergency work should cease		Non-emergency work should cease			
-40° to -42°	-40° to -44°	30 min.	5	Non-emergency work should cease							
-43° & below	-45° & below	Non-emergency work should cease									

Source: American Conference of Governmental Industrial Hygienists, Inc. (ACIGH) 1999.

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Notes:

- The schedule applies to any 4-hour work period with moderate to heavy work activity, with warm-up periods of 10 minutes in a warm location, and with an extended break (e.g. lunch) at the end of the 4-hour work period in a warm location. For Light-to-Moderate Work (limited physical movement): apply the schedule one step lower. For example, at -35°C with no noticeable wind, a worker at a job with little physical movement should have a maximum work period of 40 minutes with 4 breaks in a 4-hour period because they generate less body heat when they are less active and therefore, will get colder sooner.*
- The following is suggested as a guide for estimating winds velocity if accurate information is not available: 8 kph: light flag moves; 16 kph: light flag fully extended; 24 kph: raises newspaper sheet; 32 kph: blowing and drifting snow.*
- If only the wind chill cooling rate is available, a rough rule of thumb for applying it rather than the temperature and wind velocity factors given above would be*
 - special warm-up breaks should be initiated at a wind chill of about 1750 W/m², and*
 - all non-emergency work should cease at or before a wind chill of 2250 W/m². Wind chill cooling rate is defined as heat loss from a body expressed in watts per meter squared which is a function of the air temperature and wind velocity upon the exposed body.*

In general, the warm-up schedule provided above slightly under-compensates for the wind at the warmer temperatures, assuming acclimatization and clothing are appropriate for winter work. On the other hand, the chart slightly over-compensates for the actual temperatures in the colder range because windy conditions rarely prevail at extremely low temperatures.

The above table represents a minimum recommended schedule of maximum cold weather work periods that must be followed by a rest period. The table takes into account the combination of wind and temperature, and applies to moderate to heavy work activity. The notes on the page after the table explain how to adjust its recommendations for lighter work activity.

These TLV's apply only for workers in dry clothing.

Special Precautions

Exposure to vibration may increase a worker's susceptibility to cold injury because of the way that vibration can reduce circulation, particularly in the extremities.

Work performed in snow or ice-covered terrain may require tinted safety eyewear with side shields for protection from glare.

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Workers with health conditions that affect normal body temperature regulation or impair circulation e.g. Raynaud's syndrome, diabetes, thrombophlebitis, etc. should take appropriate precautions when working in the cold.

Body parts that have sustained a frostbite injury are sensitive to re-injury. Workers should be aware of this and limit opportunities for re-injury.

If loose or bulky clothing is worn, special care should be taken when working around moving equipment or machinery to prevent clothing entrapment.

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APPENDIX H

WHMIS (WORKPLACE HAZARDOUS MATERIALS INFORMATION SYSTEM)

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Appendix “H”: WHMIS (Workplace Hazardous Materials Information System)

The Workplace Hazardous Materials Information System (WHMIS) is a Canada-wide Hazard Communication System that deals with the most basic aspects of health and safety at worksites where chemicals are handled. It is fundamental “right to know” legislation. It enables anyone at a worksite to become knowledgeable about the hazards of the chemicals they handle or are potentially exposed to. Information about hazardous materials or “controlled products” will be provided in two forms:

- Labels or placards on the product containers, and
- Material Safety Data Sheets (MSDS).

Suppliers of controlled hazardous products and employers are both responsible for providing information of the controlled hazardous products and material.

Roles/Responsibilities

Supplier Responsibilities

- Appropriate labelling hazardous materials supplied to the workplace, and
- Preparation of the applicable MSDS.

Employer Responsibilities

- Must make the information available to all workers and ensure that a hazardous substance inventory is maintained for the regulated hazardous materials encountered on the worksite.
- Employers must have a corresponding current MSDS located for easy access by all employees. MSDS expire after three years and must therefore be renewed at the three year point or, the manufacturer can supply written confirmation that since no changes to the product/MSDS have occurred, the life of the existing MSDS is extended by attachment of the written notice.
- Employers must ensure all personnel that would potentially handle or be exposed to controlled products receive adequate training in Workplace Hazardous Materials Information System (WHMIS) and this training is current.

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Worker Responsibilities









- Hazardous products are labelled with supplier labels and/or appropriate worksite labels or other required identification;
- Comply with corresponding current MSDS requirements; and
- Are handled and stored in accordance with Company and legislated requirements.

Labels

- All products shall meet the following label requirements:
- Controlled products, chemicals and other hazardous materials, which have been brought to the workplace, must have a “Supplier Label” attached. If no label is attached or exists, the product should not be accepted, and returned with the carrier;
- The supplier label identifies the product and provides basic hazard information and hazard prevention measures;
- Symbols and written material are used on the labels so that you can immediately recognize the associated hazards;
- Controlled products manufactured at the worksite are to be labelled with “Worksite Labels or placards”. These include controlled products from outside whose original supplier labels may have been damaged, bulk containers of controlled products, and products that have been decanted;
- The worksite label identifies the product and includes basic information on its safe use, handling, storage, and disposal and refers the user to the Materials Safety Data Sheet (MSDS);
- The Hazard Symbol Chart below describe all symbols and classifications to help you prepare a worksite label; and
- For information on the symbols that do or do not apply, consult the respective MSDS. Only those symbols that do apply should be identified on the worksite label.

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WHMIS Hazard Symbols

Symbol	Description
	A: Compressed Gas (Oxygen, acetylene, Propane, aerosol spray cans, etc.)
	Class B: Flammable and Combustible Materials
	Class C - Oxidizing Materials that can emit Oxygen and thereby help other materials burn
<u>Class D: Poisonous and Infectious Materials</u>	
	D1 - Materials causing immediate and serious toxic effects
	D2 - Materials causing other toxic effects that cause long-term eye/skin irritations
	D3 - Bio-hazardous infectious materials (Live bacteria or viruses)
	Class E - Corrosive materials that cause burns through the skin or eyes, or by inhalation
	Class F - Dangerously reactive materials that can burn or explode if exposed to excessive heat, shock, or mixed with other chemical products.

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Material Safety Data Sheets

MSDS provide detailed information on controlled products. MSDS must be made available at the field office/worksites for all controlled products that you will come in contact with. If you find that a MSDS is not available, contact your supplier immediately; they are responsible for providing you with a current MSDS for the product. WHMIS requires a current MSDS to be supplied by the manufacturer of the product. MSDS have a shelf life of three (3) years.

The nine essential sections of a MSDS are as follows:

1. Product Identification and Use: This includes the manufacturer and supplier's name, address and telephone number, the product identifier, and product use. A distributor buying a controlled product for resale does not have its own identification on the MSDS.
2. Hazardous Ingredients: This provides a list of chemical identifications of all controlled products and their concentrations. Where a concentration is expressed as a percentage, it is generally by weight.
3. Physical Data: This includes the physical properties of the controlled product such as odour, density, boiling point, melting point, etc.
4. Fire or Explosion Hazard: This provides information such as the flammability limit, upper and lower explosive limits, and means of extinction.
5. Reactivity Data: This includes the conditions under which the material is unstable, the names of the substances that the product is incompatible with, and the hazardous decomposition products.
6. Toxicological Properties: This provides information on the possible health effects of the product from acute or chronic exposure, exposure limits, and names of toxicologically synergistic products.
7. Preventive Measures: This provides the required Personal Protective Equipment (PPE), specific engineering controls, emergency procedures, waste disposal, and storage and shipping requirements.
8. First Aid Measures: This includes specific first aid measures for workers.
9. Preparation Information: This provides the name and telephone number of the group preparing the MSDS and the date of preparation.

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Waste Management

For the identification, classification, handling and disposal of waste potentially generated during the Lower Churchill Project, please refer to the LCP Waste Management Plan which is part of the overall LCP Environmental Management Plan.

Transportation of Dangerous Goods (TDG)

Dangerous goods include potentially hazardous materials such as explosives, compressed and liquefied gases, flammable liquids and solids, oxidizing materials, and other substances that are poisonous, infectious, radioactive or corrosive. The Transportation of Dangerous Goods Act (TDG) exists to protect people, the environment, or property when goods are being transported by road, rail, sea or air. Shippers, carriers and receivers are all responsible for ensuring that shipments of dangerous goods comply with federal, territorial, provincial and municipal laws. Payments of any fines assessed are the responsibility of those failing to comply.

Responsibilities of the Consignor

The consignor (the shipper) must ensure that in accordance with TDG Regulations the goods are:

- Classified
- Packaged
- Marked
- Labelled
- Documented
- The consignor must provide to the carriers a copy of the shipping document and placards, if necessary. Consignors must also report any dangerous occurrences in accordance with the regulations.

Responsibilities of the Carrier

Carriers must follow all applicable TDG and other legal requirements. They are responsible for:

- Checking the shipment before accepting it;

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- Checking the documentation for accuracy;
- Mounting placards;
- Maintaining or replacing safety marks, labels, and placards, if necessary;
- Ensuring that the driver has in their possession a current TDG certificate;
- Ensuring proper shipping documents as outlined in the regulations are in the vehicle including MSDSs;
- Delivering shipping documents as outlined in the regulations; and
- Reporting any dangerous occurrences that happen during transport.
- Transport vehicle has provisions for containing and cleaning any minor spills that may occur and the driver has been trained to carry out the task as required

Note: TDG Certificates are required to be renewed every three (3) years.






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Transportation of Dangerous Goods Classifications

Class 1: Explosives

 <p>1.1 Major Explosion</p>	 <p>1.2 Major Projection</p>	 <p>1.3 Major Fire</p>
 <p>1.4 Localized Explosion</p>	 <p>1.5 Insensitive Mass Explosion</p>	 <p>1.6 Extremely Insensitive</p>

Class 2: Gases



 <p>2.1 Flammable Gas</p>	 <p>2.2 Non-Flammable, Non-Toxic Gas</p>	 <p>2.3 Toxic Gas</p>	 <p>Oxidizing Gas</p>
			

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Class 4: Flammable Substances

		
4.1 Flammable Solid	4.2 Spontaneously Combustible	4.3 Dangerous When Wet





Class 5: Oxidizers / Organic Peroxides

	
5.1 Oxidizer	5.2 Organic Peroxides

Class 6: Toxic / Infectious Substances

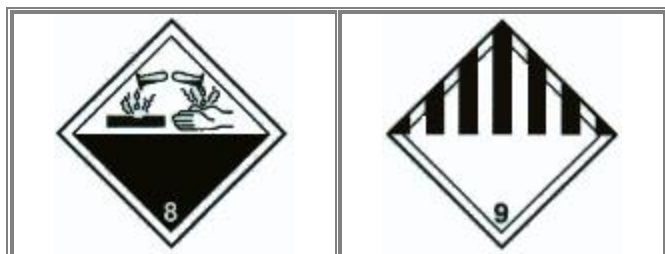
		
6.1 Toxic	6.2 Infectious (Label)	6.2 Infectious (Placard)

Class 7: Radioactive






			
(Labels or Placards)	(Labels or Placards)	(Labels or Placards)	(Placard Only)

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Class 8: Corrosives Class 9: Miscellaneous



UN Number, Packing Groups, Mixed Load

 <i>or</i>  <p>UN 1830</p> <p>UN Number (Label)</p>	 <i>or</i>  <p>UN Number (Placard)</p>
<p>Packing Groups</p> <p>I Great Danger</p> <p>II Moderate Danger</p> <p>III Minor Danger</p>	 <p>Mixed Load (Placard)</p>

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APPENDIX I

TRANSPORTATION

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Appendix “I”: Transportation

Aircraft Safety – Helicopters/Fixed Wing Aircraft

During the course of the Lower Churchill Project, workers may be required to use helicopters to access remote areas to undertake fieldwork or use charter fixed wing aircraft to access areas when commercially scheduled flights are not available. During new hire orientation sessions, aircraft safety requires discussion by a competent individual. All personnel that are required to fly are aware of safety practices/procedures. The following will serve to acquaint workers with the general procedures governing passenger conduct working in and around helicopters and fixed wing aircraft.

Pre-Flight Information

- Prior to boarding the aircraft, all passengers will participate in the safety orientation conducted by the pilot will conduct. A safety orientation will be conducted whenever a new passenger joins the flight or the aircraft type changes.
- Pilot will provide instructions on operating latches, stowage of gear and prohibited items, location of emergency equipment and survival equipment in that model of aircraft as well as how and when to approach or disembark the aircraft.
- Pilot will identify the location of the survival kit. Confirm the kit is adequate to support the number of people in the aircraft.
- Pilot will advise the emergency landing posture for the aircraft type that is to be used that day.
- All passengers will advise the pilot it is their first flying experience or if they have any personal concerns.
- All passengers must dress accordingly; consider the environment and the weather conditions that might be encountered.
- Advise the pilot of the equipment and hazardous goods that you are going to bring on the aircraft.
- Carry, on your person, a reserve of any special medication you require, as delays may occur.

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Embarking and Disembarking – General Aircraft

- Passengers shall approach, board or leave the aircraft only when directed to do so by the pilot or qualified ground crew member.
- Passengers shall obey all instructions given by the pilot.
- Use hearing protection devices provided.
- Conversation with the pilot should be restricted during the take-off and landing phases of the flight, as should intercom discussions among passengers.
- Smoking is prohibited within 10 meters of the landing pad, aircraft manoeuvring or parking areas.

Embarking and Disembarking – Helicopter

- It is preferred that the helicopter be shut down for loading and unloading passengers; in the event this is not possible, passengers shall approach, board or leave a helicopter only when signalled to do so by the pilot.
- Eye protection will be worn while boarding and leaving a helicopter that is not shutdown.
- Passengers shall approach and leave the helicopter within the pilot's field of view and walk in a crouched position while under the main rotor.
- Passengers shall only approach a helicopter, in uneven terrain, by moving up-slope or disembark by moving down-slope.
- Passengers shall not walk behind the rear doors of the helicopter cabin.
- Passengers shall not carry any objects to or from the helicopter above shoulder height.
- Hardhats, baseball caps or other headgear shall be carried to and from the helicopter or be equipped with chin straps for use near helicopters.
- Passengers will leave the helicopter and move away during refuelling.

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- During arrival and departure of helicopters, stay off the landing pad to avoid exposure to flying particles and secure all equipment within the down wash zone of the landing pad.

Vessel Operations

LCP, Contractor and subcontractor workers may be involved in boat operations during the course of the Lower Churchill Project. All workers shall wear a Canadian Coast Guard approved personal floatation device when traveling by boat and when working over water where there are no handrails or lifelines. Specific site conditions will be assessed for hazards using the appropriate risk assessment tool (JSA, LMRA etc.) and additional procedures be developed and implemented as needed.

Before boarding any sea going vessel, personnel working on the vessel must be trained in:

- Survival at sea
- Aircraft rescue at sea
- Cold weather and arctic survival

General Vehicle Safety

It is imperative for workers to exercise a high level of safety responsibility when operating a vehicle either on or off the highway or on any of the sites of the Lower Churchill Project.

All drivers will:

- Possess a valid driver's license.
- Drive at or below posted speed limits.
- Use a vehicle suitable for the conditions expected.
- Will make them-selves familiar with the vehicle jacking tools, emergency equipment and ensure the vehicle has a serviceable spare tire.
- Prior to getting into a vehicle, walk around the vehicle to check for obstacles or hazards.
- Wear a seat belt at all times when the vehicle is in motion. When travelling on frozen lakes or rivers the use of seat belts is not mandatory. Vehicle speed must be appropriate for the ice conditions.

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- Be responsible for passenger safety. All passengers shall wear seat belts at all times when the vehicle is in motion and it is the responsibility of the driver to ensure such.
- Drivers may acknowledge an in-coming call on a two-way radio and will immediately park in a safe location to continue the conversation. Drivers must park in a safe location to retrieve messages or initiate calls.
- Conduct a "Walk Around" Vehicle inspection prior to operating the vehicle each day.
- Comply with traffic laws when operating the vehicle.
- Obey all flag persons, posted signs and warnings when driving on public roads, private roads, property, sites or plants.
- Weather conditions permitting, turn off the engine and set the parking brake when the vehicle is left unattended.
- Turn off the engine when fuelling the vehicle. Check the oil level each time the vehicle is refuelled.
- Report any incident involving the vehicle and/or injury immediately or as soon as reasonably possible to a Supervisor.

All-Terrain Vehicles and Snowmobiles

All-Terrain Vehicles have been increasingly used to undertake work in terrain where regular vehicles cannot operate. All ATV and snowmobile operators shall:

- Have a valid operator's license.
- Be competent in operating an ATV or snowmobile.
- Prior to using an ATV or snowmobile, walk around the unit and check for obstacles or hazards.
- Operate the ATV and snowmobile according to provincial or territorial regulations.
- Operate and maintain the ATV or snowmobile according to manufacturer recommendations.
- Wear the protective equipment specified in the provincial or territorial regulations and by the manufacturer.

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- Inspect the ATV or snowmobile before each use.
- Use ramps to load and unload the ATV and snowmobiles from vehicles or trailers.

Heavy Equipment Hazard Zone

Workers must remain aware of the hazard zone that exists around heavy equipment:

- The work area (including turning radius) surrounding hoes, cranes and drills will be marked with barricade tape.
- Unauthorized workers will remain outside of the marked hazard zone.
- To ensure safety of personnel when loading and unloading materials or products from heavy equipment, “wheel chocks” must be used and the area flagged off.

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APPENDIX J

WORK SITE HAZARDS (WILDLIFE MANAGEMENT)

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Appendix “J”: Work Site Hazards (Wildlife Management)

We live in harmony with most wildlife in Newfoundland and Labrador, often without even realizing it. Our forests and barrens are home to many animals. Unless we intentionally seek them out, some people can go a lifetime without being aware of their presence. As long as humans and wildlife respect each other’s’ boundaries, conflicts can be avoided – but we all have to do our part to make sure we don’t encourage behaviour that could cause problems for wildlife, such as Coyotes and Black Bears.

Identifying Coyotes

The Eastern Coyote belongs to the Canidae family, which also includes wolf, fox and dog. Like most animals, coyotes usually have a natural fear of people, but they also possess natural intelligence and can quickly get used to life in residential areas as long as they have easy access to food. Although attacks on humans are extremely rare, they can occur if a coyote becomes too comfortable around people and starts associating humans with food.

If a coyote enters your work site/area you should never approach a coyote, if a coyote approaches you take the following steps:

- Give it an escape route.
- Throw rocks, sticks or other objects at the coyote.
- If the coyote continues to approach, back away slowly and move toward buildings or human activity.
- Do not turn away or run. This will encourage the coyote to chase you.

Identifying Black Bears

Black Bears are bulky animal with a moderate-sized head; a tapered, brownish muzzle and long nostrils; rounded ears; small eyes; and a short tail. Coat is usually black, sometimes with a white patch on the throat or chest. Feet are furry with five curved, non-retractable claws. Similar to the coyote, black bears usually have a natural fear of people, but they can quickly get used to life in residential areas as long as they have easy access to food. Although attacks on humans are extremely rare, they can occur if a black bear becomes too comfortable around people and starts associating humans with food.

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Little can be done to manage habituated bears. Avoid creating problem bears by making sure food, trash and other attractants are stored properly. Although black bears are usually timid and attacks are extremely rare, they are wild animals and can be dangerous.

If a black bear enters your work site/area takes the following steps:

- Stay calm
- Use “Bear Bangers” or similar noise makers
- Give the bear space and an escape route
- Speak calmly and firmly, avoid eye contact, and back away slowly
- Never run or try to climb a tree
- If the bear begins to follow you, drop something (not food) to distract it
- Be cautious around females with cubs
- If the bear attacks you, fight back and make a lot of noise. Do not "play dead."

Polar Bears

Although Polar bear encounters in Newfoundland and Labrador are rare, they have been sighted in both areas over the last few years. Polar bears are among the largest carnivores in the world. They are strong, fast and agile on ice, land, as well as in water. The best way to be safe is to avoid them completely at all times.

Polar Bear live mainly on sea ice or on land within a few kilometres of the coast. In summer, polar bears often travel along coastlines using points of land and rocky islets near the coast to navigate. They also travel inland and have been seen as far as 150 kilometres from the coast.

To best avoid encounters with all bears, it is always important to stay alert. It is recommended that in remote areas to always travel in groups of at least four people and stay together to increase safety. Creating noise while walking through remote areas will communicate your presence. It is important travel in daylight and be aware of your surroundings. Polar bears may be hard to see. Avoid areas of restricted visibility, pushed up sea ice, boulders, driftwood or vegetation. Watch for tracks, droppings and diggings.

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Never approach a bear. Polar bears defend their space and may consider you a threat. Never feed bears or other wildlife. A bear that associates humans with food is dangerous. Never approach a wildlife carcass. A bear may be in the area. Leave immediately.

It is possible to have an encounter with a polar bear by chance or because it is attracted to your activity. Polar bears are curious and may investigate any strange object, smell or noise. Always stay calm and assess the situation. Each encounter with a polar bear and bears generally is unique. Good judgment, common sense and familiarity with bear behaviour are important.

- **Curious Bears** - If a bear knows you are there and shows signs of being curious such as moving slowly with frequent stops, standing on hind legs and sniffing the air, holding its head high with ears forward or to the side, moving its head from side to side, or trying to catch your scent by circling downwind and approaching from behind, do not run. Back away slowly. Help the bear identify you as human by talking in low tones. Move slowly upwind of the bear so that it can get your scent. Always leave an escape route for the bear. Do not run.
- **Defensive Bears** - If a bear has been surprised at close range or shows signs of being agitated or threatened such as huffing, panting, hissing, growling, jaw-snapping, stomping its feet, staring directly at a person, or lowering its head with ears laid back, do not run. Back away slowly. Do not shout or make sudden movements. Avoid direct eye contact. Act non-threatening. Be prepared to use deterrents. Do not run.
- **Predatory Bears** - If a bear shows signs of stalking or hunting you such as following or circling you, approaching directly, intently and unafraid, returning after being scared away, or appears wounded, old or thin, do not run. Group together and make loud noises. Be prepared to use deterrents. Be prepared to fight back. Do not run.
- **Bears With Cubs** - Never get between a bear and her cubs. If you come across a bear with cubs, do not run. Group together and leave the area immediately. Be prepared to fight back if she attacks.

If you experience a polar bear attack use any available weapon such as rocks, blocks of ice, knives, skis or poles.

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APPENDIX K

WORKPLACE SECURITY

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Appendix “K”: Workplace Security

To address instances where security could be compromised (unauthorized access) at the construction site security practices must be properly implemented. Access to and from construction site locations will be restricted to authorized personnel only and that have a proper site orientation. Temporary vehicle gates will be installed at entrance points to the construction site location and controlled by security personnel.

The following security measures and precautions will be taken during the course of the project:

- The Site Security Provider will be responsible for placement of the security workers during and after work hours as and when warranted.
- All authorized visitors must sign in and out. All visitors must meet training requirements.
- ***All personnel working on site are not permitted to work alone on in isolation at any given time and must be accompanied (“Working Alone or in Isolation” requirements are found in OHS Regulation s.15).***
- Control of equipment and materials entering and leaving the site will be strictly monitored.
- Any hazardous wildlife sightings, security issues and incidents must be reported immediately to the designated LCP Site Environmental Advisor designated representative.

Any illegal conduct by personnel on the construction site is grounds for immediate removal and subject to be turned over to local RCMP.

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APPENDIX L

NALCOR CORPORATE HEALTH AND SAFETY STANDARDS

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Appendix “L”: Nalcor Corporate Health and Safety Standards

The following is the most current list of Nalcor Corporate Health and safety Standards:*

4.4.3.2.2 **Internal Health and safety Communications**

4.4.6 **Electronic Device Use Standard**

4.4.6.1 **Contractor Safety Management**

4.4.6.11 **Energized Power Line Hazards Permits**

4.4.6.12 **Work Methods**

4.4.6.2 **Confined Space**

4.4.6.3 **Electrical Safety Program**

4.4.6.3.1 **New Worker Hard Hat Program**

4.5.1.1 **Data Trending and Analysis**

4.5.3.1 **Incident Investigation and Reporting**

* *A number of the Corporate Health and Safety Standards are undergoing approval process at the current time.*

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APPENDIX M

ELECTRICAL SAFETY

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Appendix “M”: Electrical Safety

General:

This appendix considers live line work which will be undertaken only by Nalcor (CFALCO) personnel, in particular in accordance with Nalcor’s Electrical Safety Program. The three tables included within this Appendix describing limits of approach (for example) pertains to Nalcor employees only. Contractors are expected to comply with the limits of approach outlined in the OHS Regulations. Any work carried on by contractors on live lines must be fully described in their respective electrical safety program, which must be reviewed and approved by LCP and Nalcor prior to implementation.

Only a worker qualified to work on electrical conductors and equipment shall be authorized to do the work. (OH&S Regulations, Section 478 (2))

Approved live line techniques as determined through a formal risk assessment shall be utilized when performing such work as defined in OH&S Regulations s478 (3) addressing hazard/risk assessments.

The supervisor shall appraise the work and decide whether it can be done safely. If in doubt, he/she shall refer the job to the next level of supervision.

No other work shall be done on a pole or structure upon which live line work is in progress. This rule also applies to the pole or structure on either side of the pole being "worked on".

If possible, work on energized lines or apparatus should be done from below.

When it is necessary for one worker to change his/her working position on a pole or tower, other workers shall not do any work on energized conductors until the worker changing position has reached his/her new position.

Workers doing live work shall devote their undivided attention to the work at hand. Unnecessary conversation shall be avoided.

Neutral wires carried horizontally on the side of the pole below energized conductors shall be removed from the pole or covered with protective cover-up devices before work on the energized conductors is begun.

Neutral circuits shall never be open. Before a job is started, exposed vertical ground wire on wood pole structures within the work area shall be removed or covered with protective cover-up devices. Extreme care shall be exercised to prevent gaffing of protective cover-up devices.

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Minimum Approach Distances:

Workers shall maintain a Working Minimum Approach Distance from all Energized parts when working on or near energized Conductors. Working Minimum Approach Distance (MAD) formerly Working Limits of Approach (Qualified Persons) is defined as the shortest distance allowable between energized live conductors and any part of a worker's body, material, or tool the worker is handling.

Live Line Techniques are required for any approach to energized conductors that is closer than the distance specified in the Working Minimum Approach Distance table. Under no circumstances shall the worker's body, material, or tool the worker is handling come closer to the energized conductor than the distance specified in the Minimum Air Insulation Distance (MAID) formerly Absolute Limit of Approach (Qualified Persons) table, unless an Approved direct contact technique is being utilized.

Nalcor Energy Minimum Approach Distance

Nominal Operating Voltage		Minimum Air Insulation Distance- MAID		Minimum Approach Distance- MAD	
phase to phase	phase to ground	mm	m	mm	m
4.16 kV	2.4 kV	140	0.14	750	0.75
12.47 kV	7.2 kV	140	0.14	750	0.75
13.8 kV	7.96 kV	140	0.14	750	0.75
29.94 kV	14.4 kV	290	0.29	900	0.90
33 kV	19.05 kV	390	0.39	1000	1.00
34.5 kV	19.92 kV	390	0.39	1000	1.00
46 kV	26.56 kV	490	0.49	1100	1.10
66 kV	38.105 kV	600	0.60	900	0.90
69 kV	39.837 kV	600	0.60	900	0.90
138 kV	79.674 kV	900	0.90	1200	1.20
230 kV	132.79 kV	1400	1.40	1700	1.70
735 kV	424.35 kV	5400	5.40	5700	5.70

There is no Minimum Air Insulation Distance at these voltages when working directly on Primary Voltage Circuits using rubber gloves or other approved direct contact techniques. Unless working under the close supervision of a Qualified Person, unqualified persons shall not be allowed to approach exposed energized electrical lines or apparatus any closer than the distance specified below.

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Contractors (unqualified persons) are expected to comply with the limits of approach as outlined in the OHS Regulations. The work of contractors must be stipulated in the respective electrical safety programs.

NOTE: The following charts within this Appendix refer to live line work which will be undertaken by Nalcor personnel, in accordance with Nalcor's Electrical Safety Program. These apply to Nalcor employees only. Contractors, on the other hand, would be expected to comply with the limits of approach as outlined in the OHS Regulations (which are different from those below). The work scope of contractors must be fully described and addressed within the context of their respective electrical safety programs (which must be reviewed and approved by qualified and experienced LCP/Nalcor personnel.

Minimum Approach Distance (Unqualified Persons)

Nominal Circuit Voltages (phase to phase)	CSA Voltage Range (phase to ground)	Minimum Clearance (meters)
0.75 kV – 25 kV	0.4 – 22 kV	3.0
-69 kV	22 - 50 kV	3.0
-138 kV	50 – 90 kV	4.0
-230 kV	120 – 150 kV	4.6
-345 kV	190 – 220 kV	5.2
-735 kV	220 - 345 kV	6.7

Live Line Tools:

All Live Line work should be planned and carried out to facilitate removal of live line tools and protective cover-up devices at the end of the workday. Hot sticks and protective cover-up devices are all-susceptible to tracking and corona damage if left on the line for long periods, especially in inclement weather. Whenever possible, the hanging of live line tools on Conductors should be avoided.

Live line tools should not be used in rain, high winds, fog, or snow. In an emergency where fuse cutouts and/or disconnects must be operated, extra precautions shall be exercised such as the: wearing of rubber gloves; use of rain guards on the stick; and application of silicone to the stick immediately prior to use.

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When using live line tools, workers shall not place their hands closer to the energized metal parts of the tools than that recommended below:

Normal Circuit Voltage	Minimum Voltage and Clear Stick Distance (meters)
0.75 – 25 kV	0.7
46 kV	0.8
69 kV	0.9
138 kV	1.1
230 kV	1.5
345 kV	2.1
735 kV	4.6

- Except as necessary to secure or release them, hold out ropes or live line tools being used to spread or raise conductors shall be securely fastened and workers shall not hold them.
- The responsibility for seeing that live line tools are frequently inspected, tested and cleaned shall rest with the Supervisor.
- Live line tools such as grip-all sticks, switch sticks, and tools used in the everyday operations shall be dielectrically tested yearly or anytime they become suspect.
- Live line tools such as wire tongs, tie sticks, link sticks, strain sticks, and tools used exclusively for live line maintenance and generally transported in a proper trailer or carrier shall be dielectrically tested every three (3) years or anytime they become suspect.
- Live line tools showing any leakage shall not be used and shall be tagged with a Defective Tool or Equipment Tag and taken out of service.
- Fibre ropes and slings, used in conjunction with live line maintenance, shall be considered live line tools. Their care and storage shall receive the same attention as other live line tools.

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Storage:

All live line tools not being regularly transported should be stored in a dry location and should not be tampered with or handled by un-authorized persons. Live line tools shall be kept free from dirt and moisture, and under no circumstances shall any live line tools be laid directly on the ground.

Transportation:

Live line tools should be transported and remain in the special portable containers designed for their transportation in a manner which prevents mechanical damage and provides protection from the weather.

Servicing:

Live line tools in unsafe condition and requiring treatment or repairs shall be tagged with a Defective Tool or Equipment Tag and exchanged for a tool in good condition. Un-authorized persons shall undertake no repairs.

Protective Rubber Gloves:

Workers shall not touch or work on any exposed energized lines or apparatus except when wearing personal protective equipment approved for the voltage to be contacted.

Rubber gloves are not to be worn while climbing structures due to the risk of accidental punctures from wood splinters and other sharp pole hardware. However, rubber gloves shall be put on before entering the Minimum Approach Distance to energized lines or equipment and shall not be removed until the worker is completely out of the Minimum Approach Distance zone.

Only approved insulating gloves shall be used. Insulating gloves shall never be worn inside out or without leather protectors. They shall be exchanged any time they become damaged or if the worker to whom they are assigned has reason to doubt their condition. Leather protectors or over gloves shall not be worn except when in use over insulating gloves. When not in use, insulating gloves shall be stored in an approved canvas bag, in a cool dry place, away from high voltage equipment, and never stored inside out.

Insulating gloves shall be inspected for cracks or other damage and shall be given the roll and air test before each use.

Class 0 insulating gloves shall be worn on lines or equipment energized at 50 volts AC or 120 volts DC up to 750 volts AC/DC or when deemed necessary by the Supervisor.

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Where the use of Class 0 gloves reduces the dexterity such that a greater hazard is created the work may be performed with insulated tools or equipment only. For example, working on protection and control circuitry behind a substation protection panel requires fine motor skills in a confined area. As such, in this case, the work may be performed without rubber gloves PROVIDED that the worker is using properly rated insulated tools and equipment.

Note: This exception does not apply to work involving aerial service conductors, street lighting, meter removal and other similar activities. In these cases, rubber gloves are mandatory, unless the line or piece of equipment has been confirmed to be de-energized and grounded.

Cover-up Devices:

Protective cover-up devices shall be used on primary voltage conductors, low voltage conductors, telephone circuits, and other wires which are immediately above, below or adjacent to the work area. Except for the part of the conductor which is being worked upon, when work is to be done on or near energized lines all energized and effectively grounded conductors or guy wires within reach of any part of the body while working shall have protective cover-up devices applied.

Line hose, hoods, blankets, line guards, etc., shall be visually inspected before each job. In applying protective cover-up devices, workers shall always protect the nearest and lowest wires first. In removing protective cover-up devices, the reverse order shall be maintained. When possible, protective cover-up devices shall be applied from a position underneath the conductor.

Rubber blankets and other protective cover-up devices shall not be placed on the ground without first protecting them from physical damage and moisture by means of a tarpaulin, canvas, or protective mat. To avoid corona and ozone damage, protective cover-up devices shall not be allowed to remain in place on energized lines or apparatus for long periods, nor stored in close proximity of energized equipment.

When not in use, protective cover-up devices shall be protected from mechanical and chemical damage, and shall always be stored in the containers provided or in special compartments on trucks. Nothing else shall be stored in these containers or compartments.

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Arc Flash:

Arc Flash is a serious type of electrical explosion that can cause considerable property damage, personal injury, and even death. Any worker who is assigned to work or switch exposed energized equipment rated at 600 volts or above, shall wear the appropriate Personal Protective Equipment as prescribed in the charts below as a minimum.

For more information, please refer to Nalcor Corporate Health and Safety Standard 4.4.6.

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APPENDIX N

NALCOR CORPORATE HEALTH AND SAFETY PROGRAMS

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Appendix “N”: Nalcor Corporate Health and Safety Programs

The following is the most current list of Nalcor Health and safety Programs

- **Hazard Recognition, Evaluation and Control and TBRA Information**-Hazard recognition, evaluation and control is a thorough examination of an operation (workplace) for the purpose of identifying what actual and potential hazards exist, evaluation the level of risk in each exposure and making decisions about the effectiveness of new and existing controls. Hazard recognition, evaluation and control are also a major part of the task based risk assessment process.
- **Burning and Welding-** Due to the inherent hazards associated with the use of portable gas or electric arc equipment, burning and welding in any location not specifically designed for such activity is a high risk task. Areas specifically approved for burning and welding are enclosed by non-combustible walls, partitions or spark-tight curtains with non-combustible floors, ceilings and contents.
- **Corporate Fall Protection Program** Nalcor Energy (Nalcor) is committed to providing a safe work environment for its employees and preventing occupational injuries due to falls. Fall Protection is an integral part of our commitment to a safe work environment. Any time a worker is exposed to a fall hazard there will be a procedure and equipment to reduce and/or eliminate the hazard of working at height. Fall Protection shall be achieved through a hierarchy of controls that will involve all levels of management, supervisory and field personnel. This hierarchy shall be: elimination of hazards through engineering (design) and procedural practices; control and mitigation of hazards through passive fall protection; travel restraint systems; the use of fall arrest systems; and finally the use of administrative controls. Supervisors and workers shall be expected to assess the risks associated with a task and ensure that proper mitigation is in place to protect them while climbing and working at heights. Where a worker is unsure of the methods, equipment or procedures to reduce the risk they are to seek direction from their supervisor.
- **Disability Management Policy Statement** - Nalcor Energy is committed to assisting employees who have been injured on the job to return to work in a timely and safe manner through early intervention and active case management. To fulfill this commitment Nalcor Energy has established a Disability Management Program with a primary focus of providing injured employees a timely return to suitable and meaningful employment consistent with their functional abilities and competencies. The Disability Management Program process, is consistent with the requirements of Sections 89 and 89.1 of the Workplace Health, Safety and Compensation (WHSC) Act and applicable policies of the WHSC Commission including the

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requirement to maintain active communication with injured employees, to protect the confidentiality of personal information, and to make every effort to accommodate injured employees per the Re-employment Obligations and Duty to Accommodate provisions of the WHSC Commission Policy RE-18. All stakeholders, whether they be management, union leadership, or employees, are responsible for actively developing, participating and cooperating in the disability management process

- **Incident Investigation** - Incident investigation processes are used to gather accurate information about, and analysis of, safety incidents, including “near misses”, to determine the contributing factors to help minimize the risk of recurrence, identify key prevention initiatives, and generate lessons learned. This is documented and communicated internally through the Corporate Safe Workplace Observation Program (SWOP). While this database specifically addresses safety incidents, SWOP is also utilized to document and track incidents and/or losses related to the environment and property. Employees are required to report all safety incidents, including near misses, to ensure that appropriate preventative measures can be implemented to minimize risks, prevent recurrence and for continual improvement of the safety management system. Refer to Nalcor Corporate Health and Safety Standard 4.5.3.1
- **Noise Level Surveys and Hearing Conservation** - Nalcor Energy shall inform its employees of excessive noise levels in the workplace and provide working conditions and protective equipment to reduce the levels of exposure to those established by the Occupational Health and Safety Act & Regulations.
- **Personal Protective Equipment** - Nalcor Energy requires all employees and contractors wear approved Personal Protective Equipment (PPE) while working in designated work areas and while performing tasks where the use of PPE is compulsory.
- **Safety Footwear and Protective Clothing Allowance** Nalcor Energy will provide financial assistance to employees who, by the nature of their work, are required to purchase PPE, safety footwear and/or protective clothing. Employees covered by a Collective Agreement should refer to the appropriate clause in their Agreement.

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APPENDIX O

NALCOR HEALTH AND SAFETY FIELD INSPECTION CHECKLIST

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Appendix “O”: Nalcor Health and Safety Field Inspection Checklist

General Information and Directions

The purpose of the H&S Field Inspection Checklist is to provide reference and record for conducting a site/field inspection.

When conducting an inspection of a specific field, use the list of items under each heading as a guide to identify areas of potential hazards or areas which need to be addressed.

Assure that all deficiencies, items marked “Not Acceptable”, are actioned via the Safe Workplace Inspection/Tour section of SWOP. Take note of the item and its corresponding SWOP observation reference number in the table provided.

For further information regarding HSE inspections, please refer to MSD-HS-011 Lower Churchill Project – HSE Inspection Guidelines.

Specific Field Input Directions

Place a checkmark in the box for each item which applies to the inspection (Acceptable, Not Acceptable, Not Applicable).

Any items which have been identified as “Not Acceptable” require corrective action and a SWOP card must be completed for each. Note the item and its corresponding SWOP card reference number in the table provided on the form.

Return the completed inspection form to the LCP-HSE Department along with any SWOP cards, which may have been completed by hand. SWOP cards may also be submitted electronically.

Guidelines for Use

Introduction

The purpose of the H&S Field Inspection Checklist is to provide reference and record for conducting a site/field inspection.

Using the Checklist

When conducting an inspection of a specific site/field, use the list of items under each heading as a guide to identify areas of potential hazards or areas which need to be addressed.

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Assure that all deficiencies, items marked “Not Acceptable”, are actioned via the Safe Workplace Inspection/Tour section of SWOP. Take note of the item and its corresponding SWOP observation reference number in the table provided.

For further information regarding HSE inspections, please refer to MSD-HS-011 Lower Churchill Project – HSE Inspection Guidelines.

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Item	Accept	Not Accept	N/A
SITE GENERAL			
Lighting levels adequate for tasks performed.			
All light bulbs/tubes working and lighting covers adequately clean.			
General condition of walls, floors, floor coverings and ceilings good.			
Ventilation ducts clean and unobstructed.			
Staff/kitchen facilities provided away from work areas.			
Staff/kitchen facilities clean and tidy.			
HOUSEKEEPING			
Areas, accesses and landings free of obstructions/tripping hazards.			
Materials arranged/stored safely (including flammables).			
Tools orderly and clean. Unnecessary tools removed.			
Adequate disposal containers available/maintained.			
Adequate storage facilities provided.			
HYGIENE FACILITIES			
Toilets available and working.			
Cleanup facilities available.			
Areas clean and cleaning records maintained.			
FIRST AID			
Certified First Aider(s) identified and available.			
First aid station(s) available and appropriately equipped.			
Locations of first aid kits labelled and easily accessible.			
EMERGENCY RESPONSE			
Emergency exit routes identified and signed.			
Emergency exit lights operational.			
Emergency exit doors clear and easy to open.			
Required fire extinguishers up-to-date.			
Fire extinguishers identified by signs and 1 m clear area around.			
Evacuation maps displayed and up-to-date.			
Muster stations clearly marked.			
Emergency phones numbers displayed.			
Chief and emergency wardens identified and available.			

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Item	Accept	Not Accept	N/A
Emergency alarms checked and tested.			
Emergency equipment available (eye wash, chemical spill kit).			
PERSONAL PROTECTIVE EQUIPMENT (PPE)			
Adequate PPE provided where necessary (gloves, hard hats, etc).			
PPE properly worn where necessary.			
PPE stored and maintained correctly.			
JOB SITE POSTING / SIGNAGE			
Contractor identification sign.			
Contractor safety program.			
OH&S Act and Regulations.			
H&S Representative (name, trade, employer).			
First Aid Certificate.			
Warning signs and barricades adequately posted.			
HAZARDOUS MATERIALS			
Up-to-date MSDS available (no more than 3 years old).			
MSDS available where chemicals are used.			
Containers appropriately labelled.			
Hazardous materials safely stored and/or segregated.			
ELECTRICAL HAZARDS			
All electrical equipment in good condition.			
Electrical equipment inspected and maintained.			
Power boards used. Not double adaptors and piggyback plugs.			
Leads secured and not potential trip hazards.			
Power tools grounded or double insulated (CSA approved).			
Ground fault circuit interrupters in place.			
Explosion-proof devices where required.			
Equipment locked-out for repair.			
Compliance with corporate work protection code.			
Temporary power supply properly identified.			
Overhead lines flagged and secured.			
HAND/POWER TOOLS AND EQUIPMENT			
Guards in place/functioning.			

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Item	Accept	Not Accept	N/A
Grinding discs – speed rating and condition.			
Appropriate retainers (sockets, chippers, etc.)			
Tools/equipment in good condition.			
Defective equipment tagged as required.			
LADDERS, STAIRWELLS AND RAMPS			
No cracks or defects.			
Non-slip feet/bases.			
Correctly used and tied off.			
Non-metallic ladders used.			
Proper size and type.			
Proper handrail and landings.			
Proper filler blocks in metal stairs.			
Proper cleats on ramps.			
SCAFFOLDING			
Appropriately tagged and signed by installer.			
Footings properly supported and nailed.			
Top rail, mid rail and toe board in place.			
Properly erected.			
Proper access platform.			
Acceptable loading.			
Properly attached and capable of at least 4 times maximum load (suspended).			
Outrigger beam tied to fixed support with adequate counterweight (suspended)			
All mechanical/electrical devices in good condition (suspended).			
Independent lifelines for each worker (extend to ground) (suspended).			
SAFE WORK PRACTICES			
Personnel trained/qualified for the task.			
Permit to Work / Isolations / Lockouts used.			
Working and Height			
Safe Lifting Practices (Mechanical/Manual)			
Confined Space Entry procedures and testing.			
Precautions for work at high pressure in place.			

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Item	Accept	Not Accept	N/A
Hot/Cold Work			
Testing procedures.			

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Additional Notes/Observations	SWOP Ref.