Nalcor Energy – Lower Churchill Project

Technical Interface Management Plan

Nalcor Doc. No. LCP-PT-MD-0000-PM-PL-0006-01

Comments: Some elements of the previous revision of this document have been removed and are now included in the new document: Technical Interface Management Procedure (LCP-PT-MD-0000-PM-PR-0004-01). This document supersedes Technical Interface Management Plan (LCP-SN-CD-0000-EN-PL-0001-01).	**Total # of Pages:** (Including Cover): **10**

B2	27. Jun. 2014	**Issued for Use**	Scott Gillis	Ed Bush	David Green	Ron Power
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
Deputy General Project Manager	Jason Kean	25-JUN-2014
Ready for Operations Manager	Robert Barnes	26-Jun-2014
Strait of Belle Isle Crossing Manager	Greg Fleming	Jun 25/2014
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1.0 PURPOSE

A multi-faceted project requires a plan that provides for controlled and structured management of technical interface issues between the various groups responsible for each commitment package, component, and existing asset. The success of such a plan is dependent upon clarity, simplicity, and visibility of process such that implementation provides the desired objectives without imposing unnecessary complexity.

This *Technical Interface Management Plan* defines both the scope of and strategy for technical interface management. To this end it is imperative that this *Technical Interface Management Plan* is understood and used effectively by all Lower Churchill Project (LCP) team members, other Nalcor business units involved in the project, and Nalcor co-venture partners. Engineering, Procurement and Construction (EPC) contractors must have their own technical interface management plans that align with this.

This plan establishes the process for management of technical interfaces including identification, evaluation, approval, documentation, monitoring and closeout. This plan is not intended to circumvent or supplement the document control process although that process may be used to provide deliverables as appropriate. Nor is it intended to discourage or complicate the routine informal exchange of information between project groups. It is applicable to all major technical interface issues. Any interface deemed significant enough by either party to require formal recognition and tracking due to the potential to impact cost, schedule, or scope, shall be subject to the process described herein.

2.0 SCOPE

This *Technical Interface Management Plan* is applicable during Gateway Phases 3 and 4 as defined in the LCP Gateway Process, (reference LCP-PT-MD-0000-PM-PR-0001-01). It applies to all sub-projects of the Lower Churchill Project (Phase I), including SOBI Crossing and in principle to the Maritime Link. The plan is intended to address all manner of technical interfaces that for the purpose of this plan fall into the specific categories of Requests for Information (RFIs), Technical Queries (TQs) as well as both Internal and External Technical Interfaces. This plan and the associated procedures shall apply to all hard and soft technical interfaces that exist among the various project groups including, but not limited to: Muskrat Falls Generation; Transmission Lines; HVdc Specialties; Nalcor co-venture partners; EPC Contractors; Subcontractors; and other Consultants, Contractors, and Suppliers. Figure 1 below provides an illustration of some of the key groups between which and within which technical interfaces will exist. Examples of both external and internal interfaces are provided. This plan does not address construction and contracting interfaces which are managed through the various Project planning processes and mechanisms. Nor does it address design questions identified during the construction phase of any scope of work which are to be managed through use of the Site Query Procedure (Reference LCP-PT-MD-0000-CS-PR-0001-01).

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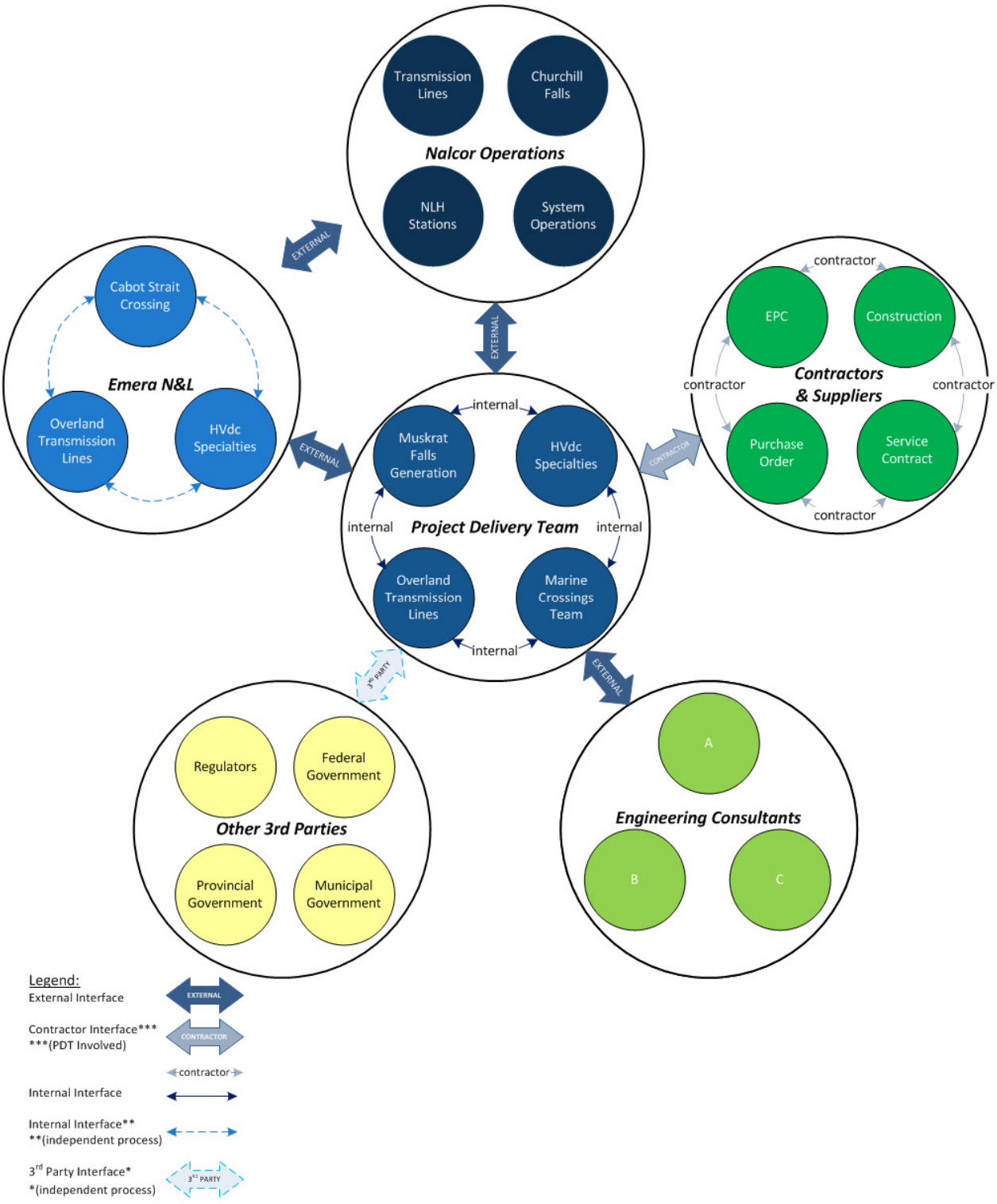

Figure 1 - Lower Churchill Project Technical Interface Information Flow

3.0 DEFINITIONS

For a complete set of terms and definitions please refer to LCP-PT-MD-0000-PM-LS-0001-01 for Project Dictionary, Acronyms and Abbreviations List.

A list of the most common terms specific to this procedure with a short description follows:

Hard Interface	A Hard Interface defines how two physical areas / items meet or fit together (e.g. size, material, location or other physical parameters). Many Hard Interfaces will be identifiable early in the design and can be registered in the system in advance of the need to resolve them.
Informal Communication	This is a form of communication that includes conversation, e-mails, telephone calls, that may provide clarity or be used to preface more formal means of exchange.
Request for Information (RFI)	A Request for Information is a formal request for a document or data set used internally by the Company, its partners, or affiliates to formalise and manage such requests between these parties. A Request for Information is not used by Contractors.
Soft Interface	A Soft Interface is a technical interface that does not pertain directly to the meeting or connection of two separate physical components. It will require the exchange of technical information but may relate to characteristics rather than physical dimensions such as in the case of environmental data, maintenance requirements, or flow rates for example.
Technical Interface	Any technical item of engineering, design, construction, supply, installation, commissioning, or operations which is the responsibility of one organization / Project scope but which affects the work of one or more other organizations / Project scopes is a Technical Interface.
Technical Interface – Contractor (TIC)	A technical interface that exists between the scopes of two Contractors / Suppliers is a Contractor Technical Interface. See also Figure 1.
Technical Interface – External (TIE)	A technical interface that exists between two separate organizations or the Project Delivery Team and another organization or Nalcor business unit is an External Technical Interface. Contractor Technical Interface are by definition External Technical Interfaces but are classified separately. See also Figure 1.

Technical Interface – Internal (TII)

A technical interface that exists between two Commitment Packages within the design scope of the Project Delivery Team is known as an internal interface. Such interfaces are indicated as such within the tracking system. See also Figure 1.

Technical Interface Management System

This is the system embodied by the Project Technical Interface Management Plan, its register, associated forms and documents, and those responsible for its implementation.

Technical Interface Register

The Interface Register is a tool used to record, track, and report on the status of interfaces. LCP will maintain a register (*LCP Interface Mgmt*)using the Aconex software tool that has been configured to monitor Interfaces through the use of fields aligned with those found on the interface forms. Completed Technical Interface forms are attached to records in the Technical Interface Register.

Technical Query (TQ)

A Technical Query is a formal mechanism used internally by the Company, its partners, or affiliates for one party to ask a technical question of another party. It is used to address those technical inquiries that do not fall under the definition of Technical Interface and that occur during the design phase. A Technical Query is not used by Contractors nor is it to be used for construction site matters.

4.0 RESPONSIBILITIES

Deputy Project Manager

Deputy Project Managers (DPMs) are responsible for providing direction and leadership within their respective components on the fundamentals of this plan. The DPM also provides direction and supervision to their component Technical Interface Engineer.

Interface Manager

Where identified as a requirement Contractors shall appoint an Interface Manager. This individual shall ensure awareness and understanding of this procedure within their group or organization and will be the single point of contact for all Technical Interface matters and have the same responsibilities as the Project Delivery Team's Technical Interface Engineer. The Contractor may include the Interface Coordinator responsibilities in this role or may appoint this separately.

Scope / Project Manager

The manager in this role is responsible for ensuring that technical interfaces emanating from their scope / area are valid, technically accurate, and adequately described prior to authorizing their submission into the system. The Scope / Project Manager is also responsible for ensuring

	that technical interfaces being responded to and originating from their scope / area are fully understood and acceptable requests prior to endorsing their agreement and progression to resolution. The manager shall also take responsibility for understanding and authorizing the deliverables prior to their delivery. Confirmation of successful resolution by managers of both the Requesting and Responding groups is required by the respective Interface Engineers prior to closing out a technical interface. As appropriate some of these responsibilities may be delegated to the respective Area Manager or Package Leader.
Technical Interface Coordinator	This individual shall ensure awareness and understanding of this plan within their group or organization. The Technical Interface Coordinator is responsible for managing the Technical Interface records and updating the Interface Register.
Technical Interface Engineer	The Interface Engineer shall represent their component or scope in support of their Project Manager. This individual shall organise workshops and meetings to assist in the identification of technical interfaces as well as provide guidance and support to their team on the overall process. Interface Engineers shall also fill the role of Interface Coordinator to facilitate the raising, completion, monitoring, and closure of technical interfaces.
Technical Interface Management Lead	The Technical Interface Management Lead is responsible for the maintenance and implementation of this plan. This includes ensuring that the plan reflects the current requirements of the Project as needs evolve, that the systems and processes associated with Technical Interface Management are clearly understood, managed, and executed by the Technical Interface Engineers, the Technical Interface Coordinators, and the Interface Managers. This individual is also responsible for representing the interests of the Project on interface issues such as participation on interface stakeholder groups as appropriate. Although the technical content of the interface management system is not the responsibility of the Interface Management Lead, the tools required to administer and report on the status of all technical interfaces is.

5.0 REFERENCES

LCP-PT-MD-0000-PM-PR-0004-01	Technical Interface Management Procedure
LCP-PT-MD-0000-PM-PR-0001-01	Gateway Process (LCP)
LCP-PT-MD-0000-CS-PR-0001-01	Site Query Procedure

6.0 PLAN

Technical Interface Management requires the support of the Project Management Team, the participation of the Project Delivery Team, and full engagement of those principal players described in the Responsibilities section. Success is reliant upon an understanding of the process and specific responsibilities (the system) as well as the identification of the Technical Interfaces that exist within the Project. The Technical Interface Management Lead must ensure that this has been addressed. It is also critical that the technical interface process and responsibilities are maintained in order to be current with the demands of the Project as it evolves.

The Project requirement for management of Technical Interfaces includes the provision of a procedure that addresses the scope of the Project Delivery Team. The procedure shall describe the system to be used to identify, evaluate, approve, document, monitor, and close all Technical Interfaces including internal, external, Technical Queries, and Requests for Information. The forms to be utilised, the details required, the responsibilities of those involved, and the means for reporting and stewarding effective closure shall be described in this procedure.

In order to ensure that the identification and maintenance of all Technical Interfaces is carried out in a thorough manner, a strategy for this must be in place. The Project strategy for identification of technical interfaces includes several techniques including interviews with representatives of the commitment packages to assemble a summary list, workshops between commitment packages to review and validate interfaces, engagement with planning representatives to confirm critical interfaces are captured in Project schedules, meetings between Project components and Area Managers to address Technical Interface challenges, and empowerment of the Interface Engineers to lead and facilitate the identification, registration, and as required review of Technical Interfaces within their areas of responsibility.

Each Contractor shall also be responsible for complying with the guidelines provided in this plan. They shall have their own internal procedure for managing their internal technical interfaces. For those contracts, such as the Engineering, Procurement, and Construction (EPC) type, that will have technical interfaces with other scopes / contracts there will be a requirement to not only comply with this plan but to use the associated procedure to manage their Contractor Technical Interfaces. Specifically, as per the requirements of the contract, “Contractor shall manage external interfaces with other organizations involved in the LCP, including Company Representative, Company's Other Contractors and their subcontractor(s) and vendor(s) of every tier, Authorities and other entities associated with the Work.”

Just as important to the success of technical interface management is the identification and management of Project Technical Interfaces with existing Nalcor Operations and assets. This includes awareness of the impact of the Project on Operations, the need to understand Operations requirements from the Project, compliance with standards, maintaining an effective relationship with activities and changes in Operations’ own plans, and in general, recognising that the Project is a deliverable to existing Nalcor Operations and must therefore accommodate the currently existing assets. In order to achieve

this it will be necessary for Project team members to establish functional relationships with key stakeholders within the Operations team to identify, monitor, and provide timely feedback on this aspect of technical interface management.

The Maritime Link is an element of the Lower Churchill Project that is being managed by another organisation, Emera Newfoundland and Labrador (ENL). It is important to recognise that although the principles of this plan apply to Technical Interfaces between the rest of the Project and Maritime Link, ENL has its own procedure to address its particular interface issues within its scope and with other parties.

Finally, there may be additional third party interests that require consideration from a Technical Interface perspective. Included in this group are government bodies at municipal, provincial, or federal levels and other utilities that may either provide or require technical input that would impact the Project. This group may be more difficult to define and may require additional support from the Project to manage inputs on their behalf. It may also require more diligence to identify such interfaces as the parties involved will not be familiar with the Project's requirements and certainly not the processes we have in place to address these requirements. With this in mind the system used by the Project Delivery Team may not be appropriate for managing these third party Technical Interfaces and there may be a requirement to be more creative to ensure they are neither over-looked nor properly managed. It will not always be practical to establish an Interface Coordinator within another organisation to facilitate the process.

7.0 RECORDS

None

8.0 ATTACHMENTS/APPENDICES/FORMS/TEMPLATES

None