

# **GATE 2 INDEPENDENT PROJECT REVIEW**

## ***Muskrat Falls Generation and Island Link Project***



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# Background

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- IPR part of the phase-gate process
- Helps ensure decision-makers understand the completeness and issues associated with the Phase 2 deliverables on which they will base their decision
- IPR Charter defined 35 Focus Areas
- 1 week effort, 4-person team with complementary and relevant backgrounds; primary activities: document reviews, interviews
- Focus on Muskrat Falls Generation, Island Link (incl. SOBI)
- Functions reviewed:
  - ▣ Finance
  - ▣ Project Engineering
  - ▣ E&AA
  - ▣ Commercial Services
  - ▣ Project Services
  - ▣ Communications
  - ▣ Excludes: Maritime link, Commercial, Gull Island Generation

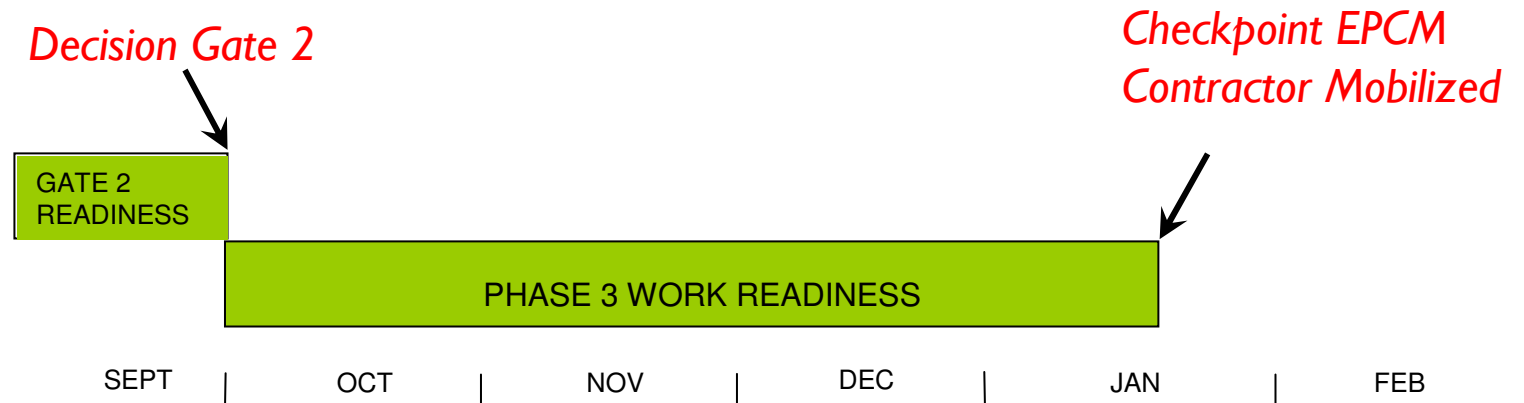
IPR IS: a high-level independent expert assessment

IPR IS NOT: an audit or validation of the work product

## IPR Objectives- Gate 2/Phase 3

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- Gate 2 Decision Readiness addresses the Project readiness of deliverables required to pass through Gate 2.
- Phase 3 Work Readiness addresses the planning and preparation work required to be completed after Gate 2 and before the EPCM contractor is mobilized.



## Summary of Findings- Gate 2 Decision Readiness

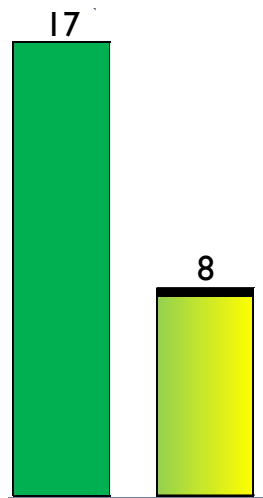
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- Gate 2 Decision Readiness: The quality, quantity and completeness of the work completed in each project function is a sufficient basis for the Gate 2 decision.

*Overall, the project is ready for a Gate 2 Decision.*

- ❖ *Complies with applicable best practice*
- ❖ *Consistent with this project's specifics*

- The Gate 2 Readiness was scored as shown:



*Out of 25 focus areas, 17 were rated as green and a further 8 were marked as green/ yellow. This is particularly impressive in light of the recent strategy change to MF first.*

## Summary of Findings- Phase 3 Work Readiness

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- The Phase 3 work readiness addresses the planning and preparation work required after Gate 2 and prior to the mobilization of the EPCM contractor.
- The Phase 3 work is already underway, significant work has been done, the team has a good understanding of what has to be completed and to augment this the IPR has identified 9 priority focus areas that the Project team shall develop specific plans to address

*Provided the same level of focus is applied timely to these priorities as the Gate 2 readiness deliverables it is expected the project will be ready when it's EPCM Contractor is mobilized.*

- The 9 focus areas are further subdivided into high, medium and low priority as shown on the following slide.

# Summary of Findings- Phase 3 Work Readiness

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| Recommendations                      |          |  |
|--------------------------------------|----------|--|
| <b>Low Priority Action Items</b>     | <b>2</b> | <ul style="list-style-type: none"> <li>• Prepare a detailed work scope &amp; first 90 day plan for EPCM Contractor .</li> <li>• Update Labour Relations strategy and proceed with resourcing plans for Labour Relations .</li> </ul>   |
| <b>Medium Priority Action Items</b>  | <b>3</b> | <ul style="list-style-type: none"> <li>• Hire HSE Manager and incorporate Safety in Design Principles .</li> <li>• Complete the Phase 3 Budget and AFE .</li> <li>• Develop 6 month staffing plan with appropriate project style policies</li> </ul>   |
| <b>Highest Priority Action Items</b> | <b>4</b> | <ul style="list-style-type: none"> <li>• Detailed plan for Phase 3 Engineering Phase required .</li> <li>• Finalize estimate probability /accuracy value.</li> <li>• Mobilization plan for Phase 3 owners team with accountabilities and responsibilities defined .</li> <li>• Governance Model &amp; Project Policies to be updated and completed for Phase 3.</li> </ul> |

## **Spirit of Openness, Cooperation, and Professionalism Throughout**

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IPR Team wishes to thank the LCPMT for extraordinary level of cooperation, openness and professionalism that was displayed by all parties and in all interview sessions.

Documentation was provided timely and efficiently

Support from the organization for logistics, catering etc. was also much appreciated.



## **Gate 2 Readiness: Findings, Observations and Recommendations**

| Summary of Findings by Focus Area - Gate 2 Readiness |                  |                  |   |   |  |
|--|------------------|------------------|---|---|--|
| IPR Focus Area Item                                  | Gate 2 Readiness | Status/ Priority | Focus Area  | Findings & Observations   | Recommendations  |
| 1  | Yes              | g/y              | That the preparation and planning of the project including those prerequisites identified by the Gatekeeper, which may not all be directly controlled by the Project team but are key enablers of the project, have been cleared or are at an advanced or otherwise acceptable state of completion or readiness. These include but are not limited to: Water Management; New Dawn Agreement; Shareholder support; Technological applications; Demonstrated need for the project based on demand; Appropriate timing for the project to proceed based on external factors ; Global financing market and liquidity; Provincial finances and forecast. | No major concerns noted. All key enablers appear to have been adequately defined for Gate 2. Key milestones such as EA release and the Innu ratification vote are externally driven yet critical to Gate 3.<br><i>Progress and current level of alignment is well beyond most projects at this stage and provide considerable level of confidence for the Gate 2 and later decisions.</i> | Develop a project-specific deliverables specification for Gate 3 and use this for planning Phase 3 activities. |
| 2  | Yes              | g                | That there are adequate processes, procedures, tools, and systems in place or planned to be developed to proceed to the next phase.   | <i>The IPR Team observation of the quality and quantity of project - specific documentation of key processes, and the implementation of state of the art systems and tools, were very good. Most were developed for a GI first strategy and will be readily applied to MF.</i>  | none   |

| Summary of Findings by Focus Area - Gate 2 Readiness |                  |                  |  |   |  |
|--|------------------|------------------|--|---|--|
| IPR Focus Area Item                                  | Gate 2 Readiness | Status/ Priority | Focus Area   | Findings & Observations   | Recommendations  |
| 3  | Yes              | g                | That there is an adequate general understanding by the project team of the processes, procedures, tools, systems and drivers of the project.                 | <i>The IPR Team's observation is that all these factors are well understood at this stage. For example, the business drivers seem to be well-recognized and in a consistent way by various discipline leads.</i>  | 1. Ensure that as the NALCOR team expands, and EPCM ramps up, this consistent project-wide understanding of business goals and how they relate to project objectives and trade-offs is maintained. |
| 4  | Yes              | g                | That the quality and completeness of the source data used by Project is suitable.  | The LCP project, both GI and MF as well as SOBI, have been under consideration for many years and extensive source data available. In addition, specialist experts were used whenever current or more in-depth information was required. <i>The IPR Team was very favorably impressed with the extensive and intelligent use of expert consultants.</i> | none   |
| 5  | Yes              | g                | That the processes and methods used for Risk Analysis, Estimating and Economic analysis comply with appropriate standards, best practices or are equivalent. | <i>The IPR Team observed good alignment between the Economics, Estimating and Finance teams.</i>  | none   |

| Summary of Findings by Focus Area - Gate 2 Readiness |                  |                  |   |  |  |
|--|------------------|------------------|---|--|--|
| IPR Focus Area Item                                  | Gate 2 Readiness | Status/ Priority | Focus Area  | Findings & Observations  | Recommendations  |
| 6  | Yes              | g/y              | That the development of the Project Charter and Project Execution Plan was carried out correctly.   | Charter developed in '07, modified for MF. Ok for Gate 2 purposes. <i>We feel Charter is too generic, too long, and contains assumed performance (e.g., milestones) that may not be met. Should be refined, more concise and project-specific and provide clear communication of business goals and project objectives/KSFs to be met.</i> | Develop a succinct, purpose-built Charter prior to kickoff of EPCM |
| 8  | Yes              | g                | That the project contract strategy has incorporated sufficient market intelligence to make it feasible from a legal, insurance and execution perspective. | The information presented to the IPR team indicates that extensive market intelligence and due diligence was performed as part of the contract strategy and selection of bidders that is consistent with best practice and the requirements of the MF project. <i>See note on execution concerns re. phase 3 schedule.</i>                 | none   |
| 10   | Yes              | g                | That the Quality Assurance processes and procedures used comply with the appropriate standards, best practices or equivalent.                             | Adequate processes and procedures appear to be in place as appropriate for Gate 2 as well as plans for Phase 3.  | none   |

| Summary of Findings by Focus Area - Gate 2 Readiness |                  |                  |   |   |   |
|--|------------------|------------------|---|---|---|
| IPR Focus Area Item                                  | Gate 2 Readiness | Status/ Priority | Focus Area  | Findings & Observations   | Recommendations   |
| 12   | Yes              | g/y              | That the development of the Project cost estimates was carried out in accordance with a defined process and that this complies with the industry standard or is equivalent. | While there is no defined estimating process for NALCOR mega-projects, the Gate 2 estimate was planned and carried out in accordance with a project-specific process commensurate with the level of definition in Phase 2. <i>It was noted that, while the change to MF first placed time pressures on estimating process documentation, the IPR team's observation is that the methodology used is consistent with best practice for this type of project at Gate 2.</i> | 1. There remains considerable work to complete the Gate 2 estimating package (e.g., see discussion of AFE, also incorporate latest decision and cost data for SOBI) as well as to move the current estimate into a format suitable for control of EPCM cost and the total project during Phase 3. |

| Summary of Findings by Focus Area - Gate 2 Readiness |                  |                  |  |  |   |
|--|------------------|------------------|--|--|---|
| IPR Focus Area Item                                  | Gate 2 Readiness | Status/ Priority | Focus Area   | Findings & Observations  | Recommendations   |
| 13   | Yes              | g/y              | That the Project Schedule has been developed in accordance to an agreed process and identifies the critical path and the correct sequence of key events. | The schedule documentation indicates a quality of planning and scheduling appropriate for Gate 2. <i>The IPR Team noted a number of schedule concerns such as the duration of Phase 3, the potential delays in EA release, and the June schedule risk analysis indicated a significant level of time-risk exposure. However, the schedule risk mitigation steps the team has taken, such as early turbine model tests and aggressive early construction program are also likely to be effective.</i> | 1. It is recommended that the schedule be reviewed to assess and incorporate the results of the time risk mitigation steps currently in place, as well as updating for latest data and ensuring consistency with the cost estimate and cashflow forecast needed for the Phase 3 AFEs. |

| Summary of Findings by Focus Area - Gate 2 Readiness |                  |                  |  |  |   |
|--|------------------|------------------|--|--|---|
| IPR Focus Area Item                                  | Gate 2 Readiness | Status/ Priority | Focus Area   | Findings & Observations  | Recommendations   |
| 14   | Yes              | g/y              | That the Engineering deliverables required to commence the next phase are available and complete. These include site investigation, model testing and study scope for Gull Island, Muskrat Falls, HVdc and associated HVac transmission. | Engineering progress to date is acceptable for Gate 2. <i>However this validation is with the proviso that the deliverables due by year-end will be completed timely - we have not judged whether this is likely to be the case or not. The collection of engineering baseline data has been well-planned, resulting in timely production professional study reports. High risk areas have been identified and additional data collection programs were initiated to address them. This judicious use of professional expertise to mitigate risk demonstrates a high degree of professionalism and maturity. Our judgment is that, in general, the studies and preliminary engineering completed to date exceeds the requirements for Gate 2 and should assist in accelerating the early Phase 3 engineering work.</i> | 1. Set date for completion of data collection for Long Range Mountain xmsn line load studies; after which progress the design based on expert judgment. 2. Clarify engineering deliverables and degree of engineering completion required for Gate 3, and develop detailed plans accordingly. |

| Summary of Findings by Focus Area - Gate 2 Readiness |                  |                  |  |   |   |
|--|------------------|------------------|--|---|---|
| IPR Focus Area Item                                  | Gate 2 Readiness | Status/ Priority | Focus Area   | Findings & Observations   | Recommendations   |
| 15   | Yes              | sg               | That financing options are advanced to an acceptable state, that no showstoppers are apparent and that there is a plan to finalize the financing required within an acceptable timeframe that is acceptable to the Gatekeeper.               | Latest developments indicate that, with the MF first strategy, there are several financing options available to the project and sufficient interest from the financial community to provide a more than adequate level of confidence at Gate 2. | none  |
| 16   | Yes              | sg               | That arrangements for power sales are advanced to an acceptable state, that no showstoppers are apparent and that there is a plan to finalize the arrangements required within an acceptable timeframe that is acceptable to the Gatekeeper. | LCP must negotiate a PPA with Hydro. <i>This is unlikely to be a problem.</i>   | none  |
| 18   | Yes              | sg               | That the negotiations and consultations with aboriginal groups are well advanced and proceeding in accordance with a plan, which has been endorsed by the Gatekeeper, including negotiation of any Impact and Benefits Agreements.           | The progress of the negotiations, Benefit Agreements etc. appears to be well advanced and sufficient for Gate 2 decision. <i>This is one of several areas that are nearing resolution but not in time for Gate 2.</i>                           | Recognize the uncertainties associated with the current status of the aboriginal agreement program. |



| Summary of Findings by Focus Area - Gate 2 Readiness |                  |                  |   |  |  |
|--|------------------|------------------|---|--|--|
| IPR Focus Area Item                                  | Gate 2 Readiness | Status/ Priority | Focus Area  | Findings & Observations  | Recommendations  |
| 23   | Yes              |                  | That there is a strategy and plan in place to have Operations and Maintenance representation in the Project and that a high level Operations philosophy has been developed which includes responsibilities during handover and a "Ready for Operations" philosophy aligned with corporate operating philosophy. | John Mallam is transitioning to this position. Draft Project Completion and Ready For Operations Procedures have been prepared. Lead engineers typically have extensive NLH operations experience at UC indicating engineering already reflects O&M considerations.<br><br><i>Although there is not a detail plan for integrating O&amp;M (John) into the EPCM design process, working as an integral part of the Engineering team we believe the plan as informally agreed will be effective.</i> | 1. Ensure that communication with the existing O&M organization is frequent and incorporated into key design reviews and decisions as the EPCM's phase 3 design work progresses. |

| Summary of Findings by Focus Area - Gate 2 Readiness |                  |                  |  |   |   |
|--|------------------|------------------|--|---|---|
| IPR Focus Area Item                                  | Gate 2 Readiness | Status/ Priority | Focus Area   | Findings & Observations   | Recommendations   |
| 24   | Yes              | g/y              | That the Environmental Assessment process is underway, on schedule, that no showstoppers are apparent and that there is a plan to finalize the environmental activities leading up to a final decision to meet the Project schedule. | EA process is being worked hard and professionally, plans in place adequate for Gate 2. <i>While there are no obvious show-stoppers at this time for GEN, it is clear that this remains an area of significant risk &amp; uncertainty the resolution of which must continue to be progressed aggressively through Phase 3. Concern that JRP does not know of switch to MF first and there is no apparent plan in place to rectify this. IL requires only EIS but this work has not started and there are no guidelines currently in place; this is planned for 1Q11, so we cannot judge the progress.</i> | 1. Ensure messaging of pivot to MF first is conducted effectively. This requires careful analysis to determine optimum timing to ensure there is no disruption to the ongoing EA process. |

| Summary of Findings by Focus Area - Gate 2 Readiness |                  |                  |   |  |   |
|--|------------------|------------------|---|--|---|
| IPR Focus Area Item                                  | Gate 2 Readiness | Status/ Priority | Focus Area  | Findings & Observations  | Recommendations   |
| 25   | Yes              | g/y              | That the strategic and tactical project risks are understood and a risk management plan is in-place and being actively pursued. | Risk Management Plan indicates good level of understanding of the primary strategic risks and drivers. The extent of Risk Management work on this project is very consistent with best practice and exceeds the progress most projects have achieved at this stage. There is a noticeable risk-aware culture across the project team of risk drivers and many activities are risk-driven (e.g., early engagement of Aon). Although a recent Risk Analysis was done based on MF, the Risk Frames used for Risk Management activities have not yet been updated. <i>The Risk Management Program in terms of both process documentation and implementation is among the best the IPR Team has seen.</i> | 1. Update the Risk Frames to reflect the MF first strategy and latest risk assessments. This should be a requirement for Gate 2.2. Ensure that supporting work processes such as trend identification, variance analysis and cost/time forecasting are developed to meet Phase 3 & 4 requirements and integrate with EPCM.3. Ensure risk culture is continued through Phases 3 and 4, and throughout the EPCM organization. |
| 26   | Yes              | g                | That the project execution approach is clearly defined, validated and endorsed by management.                                   | Execution approach is clearly defined and understood by all. <i>We agree with the thought process and conclusions that led to the EPCM approach. Strategy developed for GI applicable to MF as well.</i>   | none  |

| Summary of Findings by Focus Area - Gate 2 Readiness |                  |                  |   |  |  |
|--|------------------|------------------|---|--|--|
| IPR Focus Area Item                                  | Gate 2 Readiness | Status/ Priority | Focus Area  | Findings & Observations  | Recommendations  |
| 28   | Yes              | g                | That the project's stakeholders are identified, an engagement plan is in-place and an appropriate level of engagement underway.   | IPR team concurs on all points.  | none   |
| 29   | Yes              | g/y              | That the project management system structure is developed and implementation underway.  | Structure is developed but implementation is partially complete at this time (Hierarchy chart contains many "TBA"s indicating incomplete or non-existent procedures and work processes. <i>We suggest this is to be expected at Gate 2, but it is important that the implementation be driven to timely completion in accordance with the timing of the EPCM selection and mobilization. The effort to do this should not be underestimated. The PMS structure developed for GI applies as well to MF.</i> | 1. Continue build-out of the PMS and complete by end 2010 prior to mobilization of EPCM. |
| 30   | Yes              | g                | That investment analysis process has been used to select the optimum development alternative, scheme and sequence and that such a process is commensurate with the level of decision. | Nalcor has used PWC to support the Investment Evaluation Group and ensure a consistent approach over time and across alternatives. The modeling tools continue to evolve with the project and numerous alternatives have been evaluated.   | none   |
| 31   | Yes              | g                | That Benefits obligations are understood and clearly communicated.  | IPR team concurs on all points.  | none   |

| Summary of Findings by Focus Area - Gate 2 Readiness |                  |                     |  |  |                 |
|--|------------------|---------------------|--|--|-----------------|
| IPR Focus Area Item                                  | Gate 2 Readiness | Status/<br>Priority | Focus Area   | Findings & Observations  | Recommendations |
| 33   | Yes              | High                | That Shareholder requirements for equity and supporting debt have been communicated.   | IPR team concurs on all points.  | none            |
| 34   | Yes              | High                | That an information management plan is in place and communicated.  | Finance Minister has been closely involved throughout and there is strong support at all levels.   |                 |
| 35   | Yes              | High                | That the optimization potential for the Muskrat Falls and HVdc Island Link project phase has been evaluated and the economic and technical feasibility analysis has been carried out with an appropriate plan in place for realization of any further potential as a result of the optimization. | <u>Generation</u> : MF has been optimized within the overall development plan of the river.<br><u>XMSN</u> : the available options have been studied (e.g., xmsn to the island, xmsn thru Quebec to US, xmsn thru Newfoundland to the Maritimes), the optimum option (xmsn to the island) selected and the design configuration optimized. | none            |

## **Phase 3 Work Readiness: Findings, Observations and Recommendations**

| Summary of Findings by Focus Area- Phase 3 Readiness |                  |                  |   |  |  |
|--|------------------|------------------|---|--|--|
| IPR Focus Area Item                                  | Gate 2 Readiness | Status/ Priority | Focus Area  | Findings & Observations  | Recommendations  |
| 7  | No               | High Priority    | That the development of the Project Contracting Strategy was carried out in accordance with a defined process and that this complies with the appropriate standards, best practices or equivalent and the contracting plan. | The process by which the EPCM strategy was developed (from the EOI) and has been implemented with regard to the RFP and bid evaluation process is consistent with best practice and very appropriate for a Gate 2 decision. <i>We are concerned about the reality of the schedule: assuming contract award Dec 2010 (which could slip given the number of options to be evaluated), and a mobilization period of Jan - Mar 2011, and the requirement for local office and staffing (consistent with the Benefit Agreement), sanction is scheduled for Oct. 2011 at which time 60 -70% of engineering is to be complete. Experience suggests it is unlikely this can be achieved; if it is not, the implementation of the contract strategy gets off to a bad start based on a pattern of unrealistic objectives.</i> | 1. Develop a detailed plan and scope for Phase 3 engineering based on an agreement with the Gatekeeper as to the amount of engineering that must be completed to meet the Gate 3 requirements. |

| Summary of Findings by Focus Area- Phase 3 Readiness |                  |                  |  |  |  |
|--|------------------|------------------|--|--|--|
| IPR Focus Area Item                                  | Gate 2 Readiness | Status/ Priority | Focus Area   | Findings & Observations  | Recommendations  |
| 9  | No               | Medium Priority  | That the Health, Safety and Environment processes and procedures used comply with the appropriate standards, best practices or equivalent. | <p>1. <u>Environment</u>: NALCOR processes and procedures for compliance are well-established and will be applied to MF. Enviro. is well-integrated with Engineering to ensure regulatory requirements are properly reflected in the design from the start as well as to facilitate permitting. Interaction with regulators has been early and ongoing; expert advisors (e.g, Norway) used when needed. Interaction with NGOs well controlled. <i>We note the importance of continuing this integrated approach during Phase 3 to facilitate a socially &amp; environmentally sound design.</i></p> <p>2. <u>Health&amp; Safety</u>: Procedure development has been progressed satisfactorily for Gate 2. Greatest risk to project safety is transient, semi-skilled workers and east-coast safety culture. Project currently has no Safety Manager and this appears to have hindered progress in this function. <i>Filling this position is a high priority and the person holding it must have the competencies and authority NALCOR's commitment to Safety requires. It is not apparent to the IPR team that Safety in Design principles will be incorporated in the Phase 3 engineering.</i></p> | <p>EnvironmentNone - we rate this as GREEN<br/>Safety - we rate this as YELLOW to RED<br/>1. Ensure that a highly qualified Safety Manager is recruited as soon as possible<br/>2. Incorporate Safety in Design principles in the EPCM's Phase 3 work (e.g., include in Coordination Procedure and ensure a member of the Nalcor team has the capability and responsibility to lead this best practice.)</p> |



| Summary of Findings by Focus Area- Phase 3 Readiness |                  |                 |   |  |  |
|--|------------------|-----------------|---|--|--|
| IPR Focus Area Item                                  | Gate 2 Readiness | Status/Priority | Focus Area  | Findings & Observations  | Recommendations  |
| 11   | No               | Medium Priority | That the Project recommendation and AFE has been prepared in accordance with a defined process and that this process complies with the appropriate standards, best practices or equivalent. | The Capital Budget Process is in progress (this is expected to be challenging) but there is currently no process governing the preparation of the Gate 2 Project Recommendation or AFE. An Appropriation Plan tied to key schedule milestones is due to be complete 9/24. Project will have 2 AFEs - EPCM and summer 2011 early construction. There is no clear plan for how the Gate 3 Project Recommendation and Budget will be prepared so all three projects (GEN, IL, SOBI) are sanction-quality. <i>We believe this is a serious concern that must be addressed as part of the Gate 2 decision process. While it clearly is impractical to have these plans complete by Gate 2, there should be an agreement on the financial discipline principles involved and a plan for developing these, working backward from project-specific Gate 3 sanction requirements for predictability and AFE planning. Without a good understanding of Gate 3 sanction requirements it is impossible to understand scope of Phase 3.</i> | 1. Complete preparation of the project's Capital Budget Process.<br>2. Prepare process for developing the Gate 3 Project Recommendation and Budget, based on clear understanding and agreement of the accuracy of the cost estimate and cash-flow projections required for the Final Investment Decision as well as a streamlined AFE process for project execution. |

| Summary of Findings by Focus Area- Phase 3 Readiness |                  |                  |   |  |  |
|--|------------------|------------------|---|--|--|
| IPR Focus Area Item                                  | Gate 2 Readiness | Status/ Priority | Focus Area  | Findings & Observations  | Recommendations  |
| 19   | No               | Low Priority     | That the scope of work for Phase 3 is defined and that there is a process available for bidding, review and contract award and that this complies with best practice standards or equivalent. | The Basis of Design for MF is largely complete and fixed (no revisiting or further optimization planned) with the exception of such areas as approach hydraulics, SOBI crossing, spillway gate type, and icing loads on the xmsn lines (Long Range Mtns.) While we have not reviewed a document for this, the review process for contract evaluation and award, as explained, was consistent with best practice. The review of the bid package indicates the EPCM Phase 3 deliverables are defined in accordance with best practice and this project's requirements. <i>This is based on confidence that all the studies currently underway on these outstanding design topics will be complete end 2010 and fully documented so EPCM has complete BOD from which to start work. We are concerned that the workload associated with bid evaluation during this same period may jeopardize the timely completion of these studies. We are not sure that the owner's deliverables for Gate 3 (see notes on AFE focus area and the limited time available to complete prep of all Gate 3 deliverables) have been updated for the current project configuration (MF) and financing scheme (100% equity).</i> | 1. Prepare detailed work-scope and plan for first 90 days of EPCM to assure efficacy of early phase 3 engineering.   |
| 20   | No               | High Priority    | That a project cost and schedule estimate in the appropriate range of accuracy is available.  | The IPR Team was not provided with a definitive probability ("P") value for the cost estimate nor its level of accuracy. <i>There appears to be some ambiguity around the appropriate P-value to be used for the Gate 2 decision, as well as the correct way to utilize the latest Risk Analysis to determine accuracy.</i>  | 1. Prepare a current analysis of estimate probability value and accuracy and include this in the Gate 2 deliverables. 2. Prepare a current analysis of schedule probability value and accuracy and include in Gate 2 deliverables. |

| Summary of Findings by Focus Area- Phase 3 Readiness |                  |                  |   |  |   |
|--|------------------|------------------|---|--|---|
| IPR Focus Area Item                                  | Gate 2 Readiness | Status/ Priority | Focus Area  | Findings & Observations  | Recommendations   |
| 21   | No               | Medium Priority  | That an organization, mobilization and office plan has been developed and the organization is adequate to enter into the next phase.      | This is addressed in the Project Execution Plan and provides a level of completeness regarding roles and "LACTI" responsibilities that is commensurate with Gate 2. The proposed organization chart for Phase 3 (including Home Office and Project Team(s) appears to provide an adequate number of resources (although the final assessment of EPCM capabilities will be a major factor). <i>There does not appear to be a transition plan indicating the source of resources in key roles and how the current organization &amp; staffing will be transitioned into Phase 3. There does not appear to be a detailed plan that addresses the critical staffing issues such as relocation, compensation, contract vs salary, and retention, consistent with the tight schedule requirements if Phase 3 is to ramp up promptly.</i> | 1. Specific, short-term (6 months) staffing and recruiting plan must be developed and address transition of current staff, policy and use of salary vs. contract staff, Project Policy with regard to compensation, travel, relocation, temporary living & housing. |
| 22   | No               | High Priority    | That the organization staffing and design is commensurate with the complexity of the project and is both well represented and functional. | See above. <i>It is essential that the mindsets and behaviors of the NALCOR Phase 3 team be appropriate for the Owner role in oversight and guidance of work by the EPCM (many owner teams have difficulty "letting go" of the actual engineering work thereby rendering the contractor ineffective). The proposed organization, consisting of Home Office and Project Teams, must function as a matrix with all the well-known challenges that implies. There remain important strategic decisions as to exactly how this will work (e.g., "strong" vs "weak" matrix) and these should be taken seriously.</i>  | 1. Coordinated with the short term staffing plan above, the planned Phase 3 Home Office and Project organizations need to be fully defined in terms of manpower, competencies required, and allocations of responsibility and accountability.                       |

| Summary of Findings by Focus Area- Phase 3 Readiness |                  |                  |  |   |   |
|--|------------------|------------------|--|---|---|
| IPR Focus Area Item                                  | Gate 2 Readiness | Status/ Priority | Focus Area   | Findings & Observations   | Recommendations   |
| 27   | No               | High Priority    | That the governance structures are established and clearly communicated for current and subsequent project phases. | Governance structures appear to be not well established nor clearly communicated for upcoming phases. The team's Risk Analysis identifies "the necessary changes in governance and devolution of financial authorities and decision-making" as an important risk factor. <i>We consider this a major issue that should be resolved in principal as part of the Gate 2 decision process. <u>Inadequate or unclear governance issues:</u> Governance must be clarified around who "owns" key PM functions such as risk management, who makes what kind of decision etc. This is key to effectively managing the EPCM. <u>Overly-restrictive governance issues:</u> PMT ability to recruit, relocate, and retain key owner staff has been/will be severely restricted unless a "loose-tight" model is implemented.Grants of spending authority must be increased consistent with project's need to move quickly and by end 2010.</i> | 1. Prepare a specific, detailed specification of the governance model required for the project to be able to recruit the right resources and enable them to be effective. This <b>Project Policy</b> will likely require addressing potential conflicts between corporate governance standards (of a regulated operating company) and the relative autonomy and high grants of authority a major project requires. This must be implemented immediately following Gate 2. |
| 32   | No               | Low Priority     | That a Labour Relations Plan is in-place and clearly communicated.   | The current strategy is an amalgam of the project's work and studies from expert consultants. <i>There is a need for documentation of the overall strategy and the short term activities needed to achieve a Labour Agreement. Given the importance of Labour Relations, consideration should be given to strengthening this role in the planned Phase 3 organization(note D. Clark recommendation that a Labour Relations negotiator with major project experience be brought on board and appropriately placed within the organization consistent with the importance and level of decisions.)</i>  | 1. Update the Labour Relations Strategy to incorporate latest report from D. Clark and his timeline for near-term activities associated with setting up the process to reaching a Labour Agreement. Ideally, this would be a Gate 2 deliverable.2. Incorporate a high level Labour Relations position in the Phase 3 organization.  |



# **IPR Interview Schedule**

**IPR Schedule- September 13- September 17, 2010**

Revision 4

| Date                 | Time  | Focus Area   | Interviewees                              | Interviewers | Location                                    |
|----------------------|-------|--|---|--------------|---|
| Monday<br>13/09/2010 | 8:30  | Introductions / Safety Moment  | All involved members                      | All          | Level 1<br>Conference<br>1- Bay<br>D'Espoir |
|                      | 8:45  | Project Overview   | All involved members                      | All          | Level 1<br>Conference<br>1- Bay<br>D'Espoir |
|                      | 10:00 | Break/ Regroup   |   |              |   |
|                      | 10:15 | IPR Team Meeting   |   |              |   |
|                      | 12:15 | Lunch/ Regroup   |   |              |   |
|                      | 1:00  | 1) That the preparation and planning of the project including those prerequisites identified by the Gatekeeper, which may not all be directly controlled by the Project team but are key enablers of the project, have been cleared or are at an advanced or otherwise acceptable state of completion or readiness. These include but are not limited to: Water Management; New Dawn Agreement; Shareholder support; Technological applications; Demonstrated need for the project based on demand; Appropriate timing for the project to proceed based on external factors ; Global financing market and liquidity; Provincial finances and forecast. | Jason Kean, Paul Harrington, Lance Clarke | All          | Level 2<br>Conference<br>1                  |

|                           |      |  |  |                |                            |
|---------------------------|------|--|--|----------------|----------------------------|
|                           | 1:30 | 26 & 29) That the project execution approach is clearly defined, validated and endorsed by management. That the project management system structure is developed and implementation underway.  | Paul Harrington, Jason Kean, Ron Power, Bob Barnes, Pat Hussey               | All            | Level 2<br>Conference<br>1 |
|                           | 2:00 | 6) That the development of the Project Charter and Project Execution Plan was carried out correctly.   | Jason Kean, Paul Harrington, Lance Clarke, Ron Power, Bob Barnes, Pat Hussey | Richard/ Derek | Level 2<br>Conference<br>1 |
|                           | 2:30 | Break/ Regroup   |  |                |                            |
|                           | 3:00 | groups are well advanced and proceeding in accordance with a plan, which has been endorsed by the Gatekeeper, including negotiation of any Impact and Benefits Agreements.   | Todd Burlingame, Paul Harrington   | Richard/ Derek | Level 2<br>Conference<br>1 |
|                           | 3:30 | 24) That the Environmental Assessment process is underway, on schedule, that no showstoppers are apparent and that there is a plan to finalize the environmental activities leading up to a final decision to meet the Project schedule. | Todd Burlingame, Paul Harrington   | Bernie/ John   | Level 2<br>Conference<br>1 |
|                           | 4:00 | 27) That the governance structures are established and clearly communicated for current and subsequent project phases.   | Jason Kean, Paul Harrington, Lance Clarke                                    | Richard/ Derek | Level 2<br>Conference<br>1 |
|                           | 4:45 | Debrief  |  |                |                            |
| Tuesday<br>14/09/201<br>0 | 8:30 | 11) That the Project recommendation and AFE has been prepared in accordance with a defined process and that this process complies with the appropriate standards, best practices or equivalent.  | Jason Kean, Charles Cook, Paul Harrington, Dave Parly                        | All            | Level 2<br>Conference<br>1 |

|       |   |   |                |                            |
|-------|---|---|----------------|----------------------------|
| 9:00  | 7) That the development of the Project Contracting Strategy was carried out in accordance with a defined process and that this complies with the appropriate standards, best practices or equivalent and the contracting plan.  | Pat Hussey, Lance Clarke, Ron Power, Bob Barnes             | All            | Level 2<br>Conference<br>1 |
| 9:30  | 19) That the scope of work for Phase 3 is defined and that there is a process available for bidding, review and contract award and that this complies with best practice standards or equivalent.   | Ron Power, Pat Hussey, Bob Barnes, Lance Clarke             | All            | Level 2<br>Conference<br>1 |
| 10:00 | Break/ Regroup  |   |                |                            |
| 10:30 | 8) That the project contract strategy has incorporated sufficient market intelligence to make it feasible from a legal, insurance and execution perspective.  | Pat Hussey, Lance Clarke                                    | All            | Level 2<br>Conference<br>1 |
| 11:00 | 14) That the Engineering deliverables required to commence the next phase are available and complete. These include site investigation, model testing and study scope for Gull Island, Muskrat Falls, HVdc and associated HVac transmission.  | Bob Barnes, Ron Power, Dave Brown, Raj Kaushik, Kyle Tucker | Bernie/ John   | Level 2<br>Conference<br>1 |
| 12:00 | Lunch/ Regroup  |   |                |                            |
| 1:00  | 23) That there is a strategy and plan in place to have Operations and Maintenance representation in the Project and that a high level Operations philosophy has been developed which includes responsibilities during handover and a "Ready for Operations" philosophy aligned with corporate operating philosophy. | Bob Barnes, Paul Harrington, Ron Power                      | Bernie/ John   | Level 2<br>Conference<br>1 |
| 1:30  | 9) That the Health, Safety and Environment processes and procedures used comply with the appropriate standards, best practices or equivalent.   | Jason Kean, Marion Organ                                    | Richard/ Derek | Level 2<br>Conference<br>1 |



|                        |       |  |   |                |                      |
|------------------------|-------|--|---|----------------|----------------------|
|                        | 2:00  | 10) That the Quality Assurance processes and procedures used comply with the appropriate standards, best practices or equivalent.  | Ron Power, Mark Peddle                    | Richard/ Derek | Level 2 Conference 1 |
|                        | 2:30  | Break/ Regroup   |   |                |                      |
|                        | 3:00  | 28) That the project's stakeholders are identified, an engagement plan is in-place and an appropriate level of engagement underway.  | Leona Barrington                          | Richard/ Derek | Level 2 Conference 1 |
|                        | 3:30  | 25) That the strategic and tactical project risks are understood and a risk management plan is in-place and being actively pursued.  | Lance Clarke, Jason Kean, Paul Harrington | All            | Level 2 Conference 1 |
|                        | 4:00  | Review of Monthly Report Session   | Lance Clarke, Jason Kean, Paul Harrington | All            | Level 2 Conference   |
|                        | 4:30  | Debrief  |   |                |                      |
|                        |       |  |   |                |                      |
| Wednesday<br>15/09/201 | 8:30  |  |   |                |                      |
|                        | 9:00  | 15) That financing options are advanced to an acceptable state, that no showstoppers are apparent and that there is a plan to finalize the financing required within an acceptable timeframe that is acceptable to the Gatekeeper. | Derrick Sturge, Rob Hull, Mark Bradbury   | All            | Level 2 Conference 1 |
|                        | 9:30  | 30) That investment analysis process has been used to select the optimum development alternative, scheme and sequence and that such a process is commensurate with the level of decision.  | Derrick Sturge, Rob Hull, Mark Bradbury   | All            | Level 2 Conference 1 |
|                        | 10:00 | 33) That Shareholder requirements for equity and supporting debt have been communicated.   | Derrick Sturge, Rob Hull, Mark Bradbury   | Richard/ Derek |                      |

|  |       |  |  |     |                      |
|--|-------|--|--|-----|----------------------|
|  | 10:30 | Review of Monthly Report Session   | Jason Kean, Paul Harrington, Lance Clarke  | All | Level 2 Conference 1 |
|  | 11:00 | Break/ Regroup   |  |     |                      |
|  | 11:15 | 22) That the organization staffing and design is commensurate with the complexity of the project and is both well represented and functional.  | Jason Kean, Paul Harrington, Lance Clarke, Ron Power, Bob Barnes                               | All | Level 2 Conference 1 |
|  | 11:45 | 21) That an organization, mobilization and office plan has been developed and the organization is adequate to enter into the next phase.   | Jason Kean, Paul Harrington, Lance Clarke, Ron Power, Bob Barnes                               | All | Level 2 Conference 1 |
|  | 12:15 | Lunch/ Regroup   |  |     |                      |
|  | 1:00  | 12) That the development of the Project cost estimates was carried out in accordance with a defined process and that this complies with the industry standard or is equivalent.<br>5) That the processes and methods used for Risk Analysis, Estimating and Economic analysis comply with appropriate standards, best practices or are equivalent. | Doug Maloney, Dave Parody, Jason Kean, Tony Scott, Steve Goulding, Steve Goudie, Mark Bradbury | All | Level 2 Conference 1 |
|  | 1:30  | 13) That the Project Schedule has been developed in accordance to an agreed process and identifies the critical path and the correct sequence of key events.   | Doug Maloney, Dave Parody, Jason Kean, Tony Scott  | All | Level 2 Conference 1 |
|  | 2:00  | 20) That a project cost and schedule estimate in the appropriate range of accuracy is available.   | Doug Maloney, Dave Parody, Jason Kean, Tony Scott  | All | Level 2 Conference 1 |
|  | 2:30  | Break/ Regroup   |  |     |                      |

|                       |        |  |   |                |                      |
|-----------------------|--------|--|---|----------------|----------------------|
|                       | 3:00   | 31) That Benefits obligations are understood and clearly communicated. | Maria Moran, Lance Clarke   | All            | Level 2 Conference 1 |
|                       | 3:30   | 34) That an information management plan is in place and communicated.  | Judy Ludlow, Lance Clarke   | All            | Level 2 Conference 1 |
|                       | 4:00-A | Strait Of Belle Isle Task Force  | Ron Power, Brian Bugden, Greg Fleming, Mark Peddle, Tim Ralph, Bernard Madden | Bernie/ John   | Level 2 Conference 1 |
|                       | 4:00-B | 32) That a Labour Relations Plan is in-place and clearly communicated. | Debbie Molloy, Lance Clarke   | Richard/ Derek | TBA                  |
|                       | 4:30   | Debrief  |   |                |                      |
|                       |        |  |   |                |                      |
| Thursday<br>16/09/201 | 8:30   |  |   |                |                      |
|                       | 9:00   |  |   |                |                      |
|                       | 9:30   |  |   |                |                      |
|                       | 10:00  | Break/ Regroup   |   |                |                      |

|  |       |   |                 |     |                            |
|--|-------|---|-----------------|-----|----------------------------|
|  | 10:30 | Interview- Ed Martin  | Ed Martin       | All | Ed's Meeting Room- Level 6 |
|  | 11:00 | Interview- Ed Martin  | Ed Martin       | All | Ed's Meeting Room- Level 6 |
|  | 11:30 |   |                 |     |                            |
|  | 12:00 | Lunch/ Regroup  |                 |     |                            |
|  | 1:00  |   |                 |     |                            |
|  | 1:30  |   |                 |     |                            |
|  | 2:00  | Interview- Gilbert Bennett (Gilbert booked 2:00-4:00)-<br>Unfortunately due to urgent commitments, the interview between Gilbert Bennett and the IPR team didn't occur. | Gilbert Bennett | All | Level 2 Conference 1       |
|  | 2:30  |   |                 |     | Level 2 Conference 1       |
|  | 3:00  |   |                 |     | Level 2 Conference 1       |
|  | 3:30  |   |                 |     | Level 2 Conference 1       |
|  | 4:00  |   |                 |     |                            |
|  | 4:30  |   |                 |     |                            |
|  |       |   |                 |     |                            |

|                     |       |              |  |     |   |
|---------------------|-------|--------------|--|-----|---|
| Friday<br>17/09/201 | 8:30  |              |  |     |   |
|                     | 9:00  | IPR Findings |  | All | Level 1<br>Conference<br>1- Bay<br>D'Espoir |
|                     | 9:30  | IPR Findings |  | All | Level 1<br>Conference<br>1- Bay<br>D'Espoir |
|                     | 10:00 | IPR Findings |  | All | Level 1<br>Conference<br>1- Bay<br>D'Espoir |
|                     | 10:30 | IPR Findings |  | All | Level 1<br>Conference<br>1- Bay<br>D'Espoir |
|                     | 11:00 | IPR Findings |  | All | Level 1<br>Conference<br>1- Bay<br>D'Espoir |
|                     | 11:30 | IPR Findings |  | All | Level 1<br>Conference<br>1- Bay<br>D'Espoir |
|                     | 12:00 |              |  |     |   |

## **IPR Team Biographies**

## IPR Team- Biographical Information

### **Richard Westney- *Westney Consulting Group***



Richard's consulting focus is on Program Strategies and Strategic Risk Management, as well as Executive Learning.

Author of 5 books on project management, Richard Westney is internationally recognized as a source of interesting and powerful techniques for planning and executing projects. He has served as visiting faculty for executive programs at the University of Texas, Texas A&M and Stanford Universities, as well as at The Norwegian University of Science and Technology in Trondheim, Norway.

He founded Westney Consulting Group in 1978 after working on international production, refining, and chemical manufacturing projects for Exxon. A licensed Professional Engineer, he is also a certified Project Management Professional. Richard is a Fellow and Past-President of AACE International (The Association for the Advancement of Cost Engineering), and a recipient of AACE's highest honor, The Award of Merit. He holds a BS in Mechanical Engineering from the City College of New York, an MS in Management Science from Rensselaer Polytechnic Institute, and is also a graduate of the 3-year Owner/President Management Program at Harvard Business School.

### **Bernie J. Osiowy- *Independent Consultant***

Mr. Osiowy has over forty years of experience in the planning, design, construction and commissioning of hydraulic generating stations. During his time with Manitoba Hydro, he was part of the Hydro Power Planning Department which was responsible for the engineering portion of the planning associated with the development of new sources of hydraulic generation. He has a BS – Engineering, from the University of Saskatchewan and is a registered professional engineer, and also a member of the Professional Engineering Association of Manitoba.

**Derek Owen- RDO Consulting Limited**



Derek has over 40 years experience in project management of oil and gas projects with major EPC contractors and from 1981 to 2002 with Mobil, ExxonMobil where as Project Manager and Manager for East Coast Projects Canada he was responsible for execution of large onshore and offshore projects. As the management committee representative for ExxonMobil he was responsible for Terra Nova, Hebron, and Sable Tier 2 projects.

In 2002 Derek retired from ExxonMobil to set up RDO Consulting Limited to provide Project Management services to the petroleum industry such as, project gate reviews and IPR's, project team alignment workshops and development of project execution strategies, etc. His clients include all the majors involved in projects in Newfoundland and Nova Scotia and major operators in Alberta oil sands projects. His experience with east coast Canada projects covers a period of 20 years.

Derek holds a B.Sc from Nottingham University UK in mechanical engineering, is a Life Member of the Association of Professional Engineers of Nova Scotia, Fellow of the Institution of Mechanical Engineers UK and Chartered Engineer UK.

**John Mallam- Nalcor Energy**



John was appointed to the leadership team as Hydro's Vice President of Engineering Services in March 2006. He joined the Newfoundland and Labrador Power Corporation in 1975 and has been involved in the design, construction, commissioning and modification of most of Hydro's generating facilities.

He has been involved in research and development through the Canadian Electrical Association for over 25 years. He holds a Bachelor of Engineering degree from Memorial University of Newfoundland and is a member of Professional Engineers and Geoscientists of Newfoundland and Labrador.