



Lower Churchill Project

Project Management Approach (Post-Gate 2) & Contracting Strategy



HYDRO
THE POWER OF
COMMITMENT

21 April '08

Safety Moment

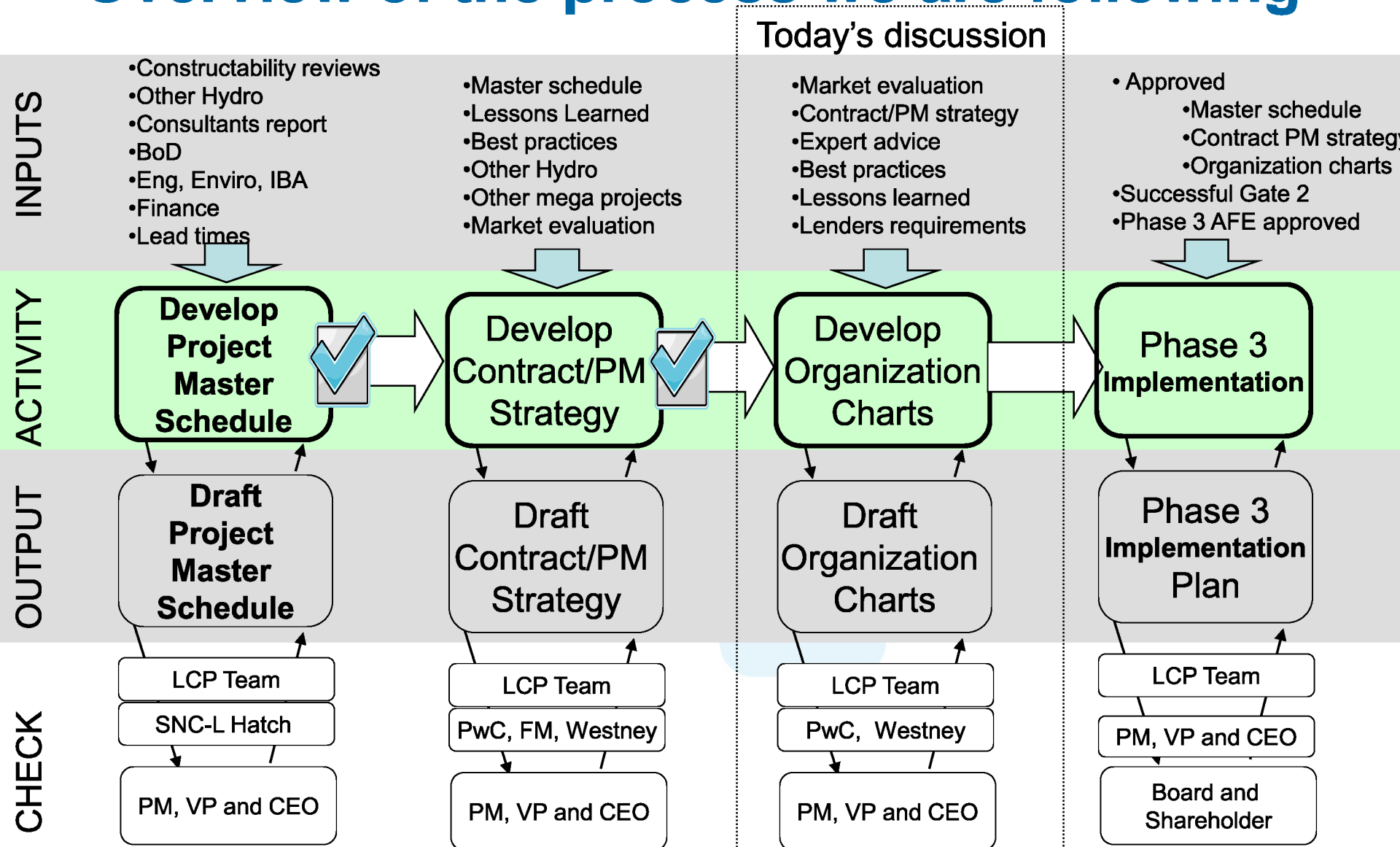
~~ Tyres~~

- Time to switch over from winter to summer tyres
- Check for uneven wear – sign of alignment problems
- Check for damage – side walls and tread area
- Rotate tyres and get balancing done
- Check correct rotation
- Replace worn tyres
- Check air pressure regularly

Purpose

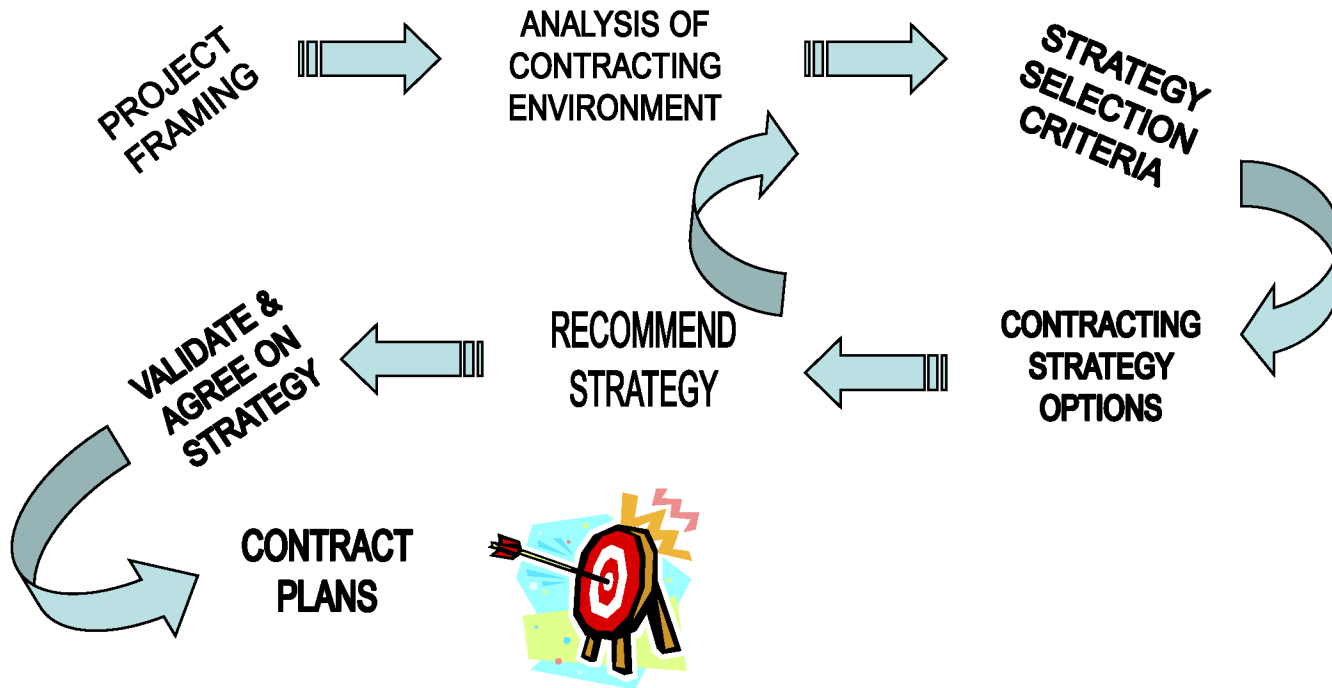
- To review the proposed Post-Gate 2 Project Management Approach and associated Contracting Strategy for the LCP
- To obtain executive management agreement to proceed.
- Review Organizational proposal

Overview of the process we are following



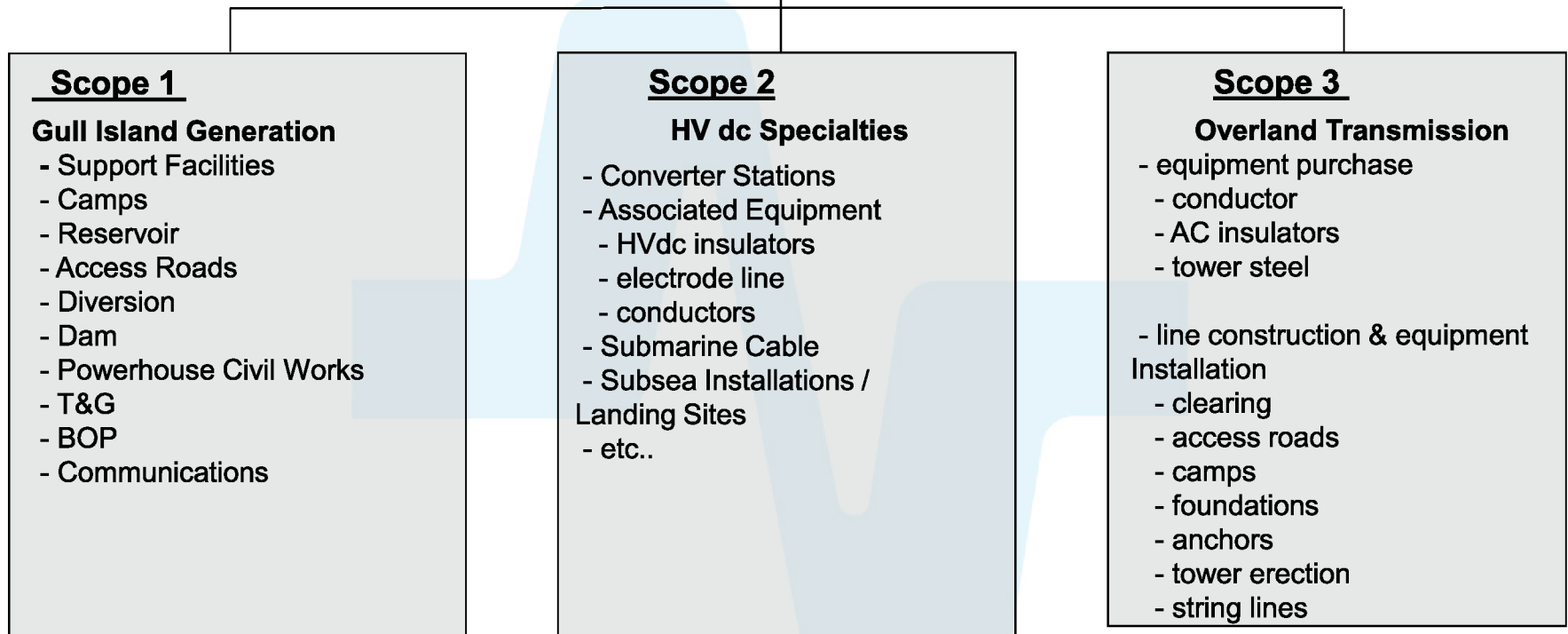
Evaluation Process

STRATEGY EVALUATION PROCESS



Project Framing

Integrated PMT



Notes

1. Includes export to Maritimes (Lingan)
2. No contingency included
3. Shown in CAD 2008
4. IDC not included

Scope 1 - Gull island Generation

- Includes multiple contracts for a diverse range of work scopes
 - ❖ Site preparation and access roads
 - ❖ Early works
 - ❖ Site temporaries
 - ❖ Accommodations and administration
 - ❖ Reservoir clearing
 - ❖ Diversion tunnels
 - ❖ Powerhouse
 - ❖ Intake and penstocks
 - ❖ Main excavation works and dam
 - ❖ Spillway structure
 - ❖ Turbine gens and BOP
 - ❖ Switchyards
 - ❖ Communications
 - ❖ Catering
 - ❖ Site services
 - ❖ HADD
 - ❖ LCP site team
 - ❖ Permits

Scope 2 – HVdc specialities

- Includes EPCC of HVdc systems with one supplier/contractor
 - ❖ Converter stations at Gull, Soldiers Pond and Maritimes end (NS) at appropriate ratings
 - ❖ Sub sea cables across S of Belle Isle and Maritimes (NS)
 - ❖ Switching stations
 - ❖ Communications
 - ❖ Engineering
 - ❖ Project management

Scope 3 – Overland Transmission

- Includes
 - Owner purchase of steel and members for towers, conductors supplied free issue to multiple installation contractors.
 - ❖ AC transmission from Gull Island (GI) to Churchill Falls
 - ❖ DC transmission from GI to Strait of Belle Isle (SOBI)
 - ❖ DC transmission from SOBI to Taylor's Brook (TB)
 - ❖ DC transmission from TB to Soldier's Pond (SP)
 - ❖ DC transmission from TB to Cape Ray (CR)
 - ❖ Electrode lines

Analysis of Mega Project / Contracting Environment

- Steps in process to formulate drivers / criteria for selection of LCP execution strategy included:
 - ❖ Compilation / analysis of knowledge / Lessons Learned relevant to mega projects;
 - ❖ Market conditions (latest market place realities / market intelligence);
 - ❖ Obtaining understanding of Industry trends;
 - ❖ Understanding supply community capability / desires.
 - ❖ Understanding financing requirements

Analysis Cont'd.....

Sources

- LCP staff experience
- The IPA Institute (division of Independent Project Analysis Inc.)
- Other Hydro Companies
- Oil & Gas Projects
- Market Intelligence / visits by LCP staff
- Participation in the Canadian Electrical Utilities Project Management Network Group
- Hatch report “PM009 – FEED Deliverables”

Analysis Cont'd.....

Key Lessons and Industry Trends

- Sufficient Level Owner involvement / direction / control is essential;
- Integrated teams are more successful / Team integration drives predictability;
- Currently tight engineering and contractor supply market with consolidation abound;
- Ensure individual contract size is manageable within contractor capability;
- EPC contracts where appropriate but one single EPC contract for mega projects have significant disadvantage in cost (30% uplift);
- Contractors need to stay within their expertise
- IPA recommends a blend of strategies for distinct and different parts of the project – the one size fits all contract strategy be avoided
- Our financial advisors recommend a situational analysis with appropriate project management and contract strategies applied as appropriate

Drivers / Selection Criteria

Our guiding principles are to deliver a project with cost and schedule considerations as the primary objectives by considering:

1. High FEL / Achievement of Project Definition
2. Cost & Schedule Predictability
3. Alignment with Financial Strategy / Lenders Engineer requirements
4. Optimal Allocation of Risk
5. Alignment with contractor availability / capability (Contractor Appetite for Mega Projects)
6. Benefit Strategy
7. Appropriate degree of Project Management by Owner

Project Management Options

Activity	Option 1	Option 2	Option 3
Oversight / audit	Integrated LCP Team	LCP	LCP
Phase 3 Engineering	<div style="background-color: yellow; padding: 5px; text-align: center;">Eng. Contract</div>	EPCM Contractor	EPC Contractor
Project Management, engineering, procurement, cost/schedule, project services			
Site management, Overall Labour Set Up (work planning, co-ordination, approval, control)			
Labor issues / construction supervision	Construction Contractors	Construction Contractors	
<p><u>Contract Types</u></p> <ul style="list-style-type: none"> - Procure / Construct - Construct - EPC (e.g. T&G) 			

Recommended Strategy – Option 1

- Recommend fully integrated project team consisting of :
 - ❖ Owner/Consultants/Engineering/project support contractor to manage the 3 streams
- Effectively resulting in an Owner's EPCM arrangement with incentives schemes that will be acceptable to Lenders Engineer;
- Actual delivery of some E, P, C, and M functions will be to the degree dictated by each contract package
 - ❖ detailed contract plan will outline individual contracting strategies
 - ❖ e.g. some scopes / packages will lend themselves to EPC arrangements – T&G / HVdc specialties, etc...

Overview of relative distribution of Project Capital Costs

CIMFP Exhibit P-02095

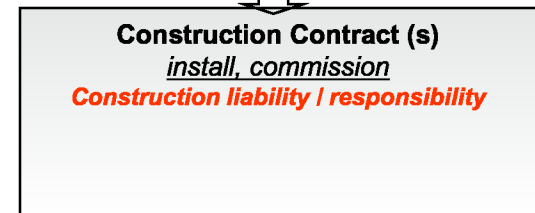
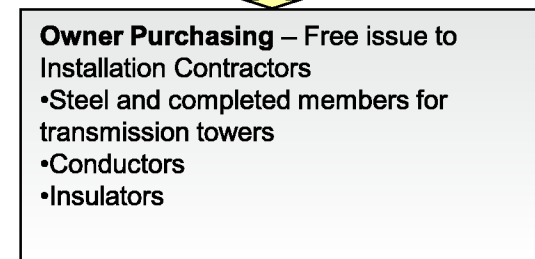
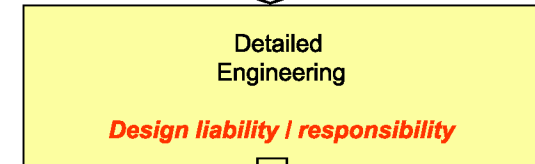
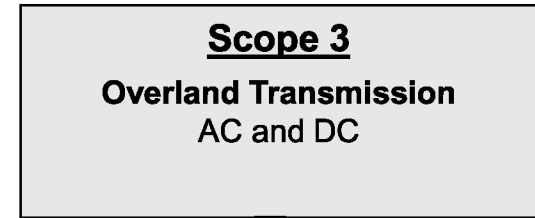
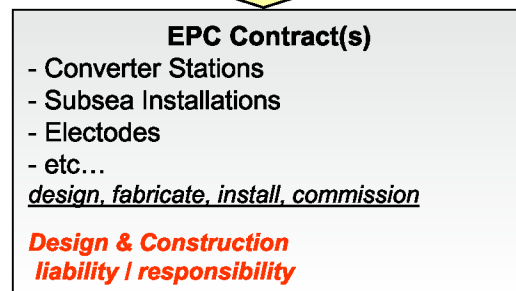
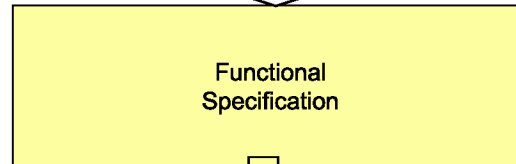
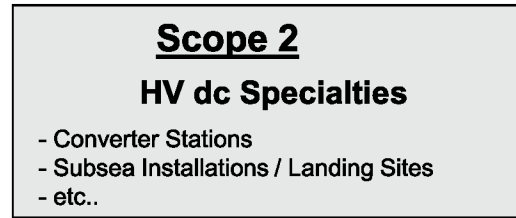
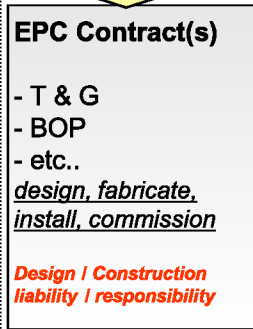
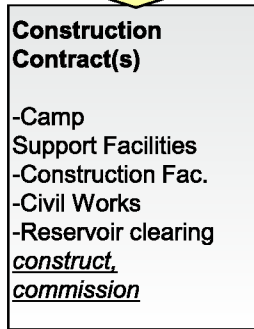
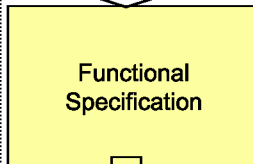
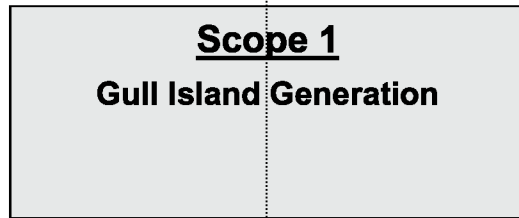
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Mix of Lump sum and unit rate

Primarily EPC Lump Sum

Primarily EPC Lump Sum

Primarily Lump Sum
Materials free issue by Owner



Construction liability / responsibility

Cap Costs
~14% of Unit Rate
~10% Lump sum

~20% of Cap Cost

Scope 1 ~44% of Cap Cost

Scope 2 ~31% of Cap Cost

Scope 3 ~25% of Cap Cost

Lenders perspective (summary of PwC advice)

- **The single EPC approach is not a requirement – complex projects require more appropriate solutions**
- **Lump sum and EPC type contracts are viewed as providing price certainty**
- **Incentives are viewed as positive and help to gain price certainty – e.g. completion bonuses, LD's**
- **Creditworthy contractors and suppliers are essential**
- **Project Management team (integrator) must have aligned incentives to finish the project on time and on cost targets**
- **Engineering, Project Management and Construction Contractors must be experienced and have a solid reputation and name**
- **Lenders can be convinced of non conventional project delivery methods but need to have lenders engineer buy in**
- **Lenders do not like to have changes sprung on them too late so at financial sounding introduce the approach that will be taken and stick to that approach**

How Would Price Certainty Be Viewed

■ Price Certainty

- ❖ 60 to 75% of Project Capital Costs would be EPC and/or Lump sum type with 10 to 15% Owner supplied material and remainder unit rate type
- ❖ EPC and Lump Sum contracts would have LD clauses
- ❖ Firm quantities for unit rate contracts would be determined by financial close
- ❖ Creditworthiness of Contractors and Suppliers would be part of the contract evaluation process
- ❖ Comprehensive QA program to be in place
- ❖ Only tried, tested and proven technology to be used
- ❖ Risks are identified, mitigated and assigned
- ❖ Rigorous cost and schedule controls to be in place
- ❖ Comprehensive Change management processes
- ❖ Lessons learned and Best in class processes to be employed

How Would Credibility Be Viewed

- Credibility

- ❖ We have to recognize that ECNL has no history of successful major project execution – so we must focus on the NL experience and the quality of our people, suppliers and contractors
- ❖ All positions shall have defined role descriptions with qualifications and experience required, all key roles will be hand picked and some senior positions will be from international sources
- ❖ Engineering and PM Contractors would be with internationally recognized companies e.g. Hatch, SNC-L, MWH
- ❖ Suppliers would be internationally recognized and leaders in their fields of business e.g. ABB, Voith Siemens, Areva, Alstom
- ❖ Civil Contractors would be major hydro/civil contractors e.g. PKS, PCL, Imbregilo, Skanska
- ❖ Specialist advisors include PwC, Westney, IPA, Landsvirkjun, Statnett
- ❖ PM contracts would include incentives to achieve cost and schedule targets to gain alignment and commitment of integrated team

Our Approach to Phase 3 Organization Design

- In phase 2, issue RFP to pre qualified engineering consultants for Scope 1, 2 and 3. We expect to move forward with two major consulting groups in an integrated team.
- We have learnt from recent experience that the hands off approach does not work we must manage the consultants and be co-located to be successful
- The consultants would produce the engineering deliverables as shown previously with design integrity checking of drawings and specifications by LCP engineering (B Barnes and team)
- Procurement and contracting would be carried out by LCP (L Clarke and team)
- The organization charts for Phase 3 (colour coded to show parent organization) have been developed with role descriptions for key personnel
- Senior Construction personnel will be required during Phase 3
- The numbers and disciplines of personnel on the charts have been benchmarked against other hydro projects by the LCP teams

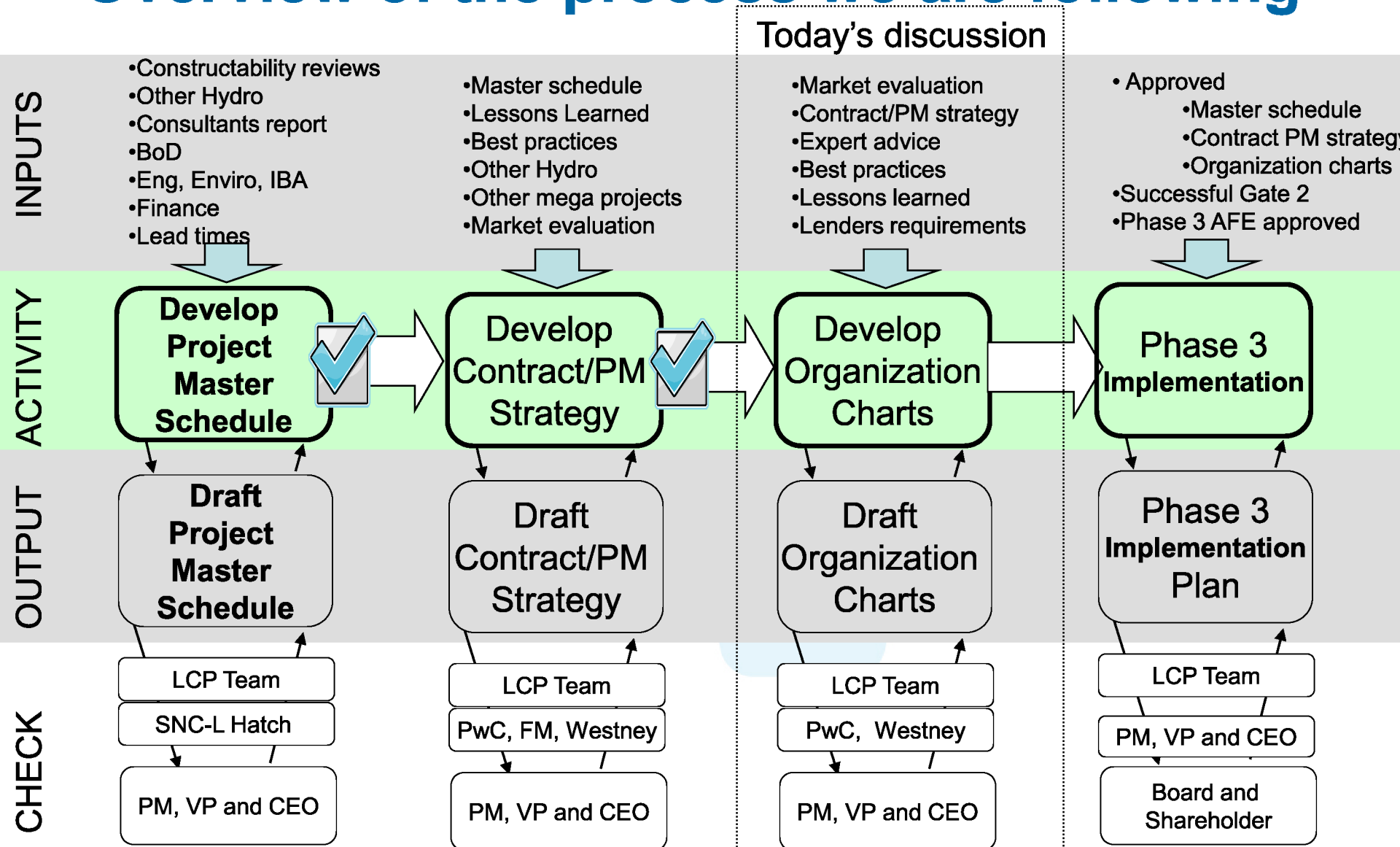
Our Approach to Phase 4 Organization Design

- **As demonstrated successfully on other mega projects, the model is to have a Home Office team which has the overall responsibility for HSE, Cost, Schedule, Risk, Planning, Engineering changes and Project Management with satellite site teams at major construction sites, primarily at Gull Island**
- **The Site Managers and their teams are responsible for construction, MC and commissioning to the required quality standard and to deliver the completed systems at site and handover these to the Operations Team- there will be a Site Team Manual developed to describe all site team functions and protocols**
- **The organization charts for Phase 4 have been developed – it is too early to identify parent organization, this will be done later, the intent will be to migrate personnel from the Phase 3 organizations into Phase 4, key role descriptions have been developed**
- **Construction Management with personnel possessing extensive major hydro/civil construction experience will dominate the site team organizations**
- **The numbers and disciplines of personnel on the charts have been benchmarked against other hydro projects by the LCP teams**

Next Steps

- Seek senior NLH approval of recommendation;
- Continue discussion with PWC & Faskens to ensure alignment
- Develop document (RFP) to issue to potential PSC contractors;
- Receive, review and negotiate contracts based on proposal submissions.
- In order to meet schedule:
 - ❖ Phase 3 Engineering contract(s) needs to be awarded by mid 08 so that process can start for other Contracts and Equipment PO's such as:
 - ◆ Camp, Reservoir Clearing, Construction Bridge, Diversions, Early civil, TG sets, Cable, etc.
 - ❖ Suitable office location to be identified for occupation after Gate 2 is achieved

Overview of the process we are following





Construction Management

- Integrated team (Owner, Consultants, Project Support Contractor personnel)
- Appropriate construction contracts to be awarded
 - ❖ Manage labour provide under SPA
 - ❖ Execution & supervision
- Overall coordination by LCP Team
 - ❖ Site coordination and oversight
 - ❖ Overseeing and coordinating contractors
 - ❖ Managing interfaces between contractors & engineers



Project Support Contract(s)

Project Support Contract(s)

- Project Support Contracts will be put in place to:
 - ❖ Provide engineering function for the 3 main LCP scope streams
 - ❖ Provide staff to supplement Owner's staff in all team functional areas
- The selected Project Support Contract personnel will be integrated into the LCP team on a reimbursable contract basis.
- “Best person for the job” approach to be used in approving PSC personnel.

Project Support Contract(s)

Primary early focus for the Project Support Contract will be the provision of engineering services as follows:

- Engineering Deliverables Management **with design responsibility**
 - ❖ Engineering design
 - ❖ Drawing and drafting
 - ❖ Technical specifications
 - ❖ Engineering “package” engineering

Project Support Contract (Cont'd.)

The Project Support Contract will bolster / complement the other team functions:

- Project Management
- Project Controls
- Contracts & Procurement
- Construction Management / Constructability expertise
- Information Management inc'l Document Mgmt.
- Benefits Monitoring
- Office Management
- Quality Mgmt / QA/QC
- Safety Mgmt.
- Environment Mgmt.
- Risk Mgmt.
- Labour Relations
- HR

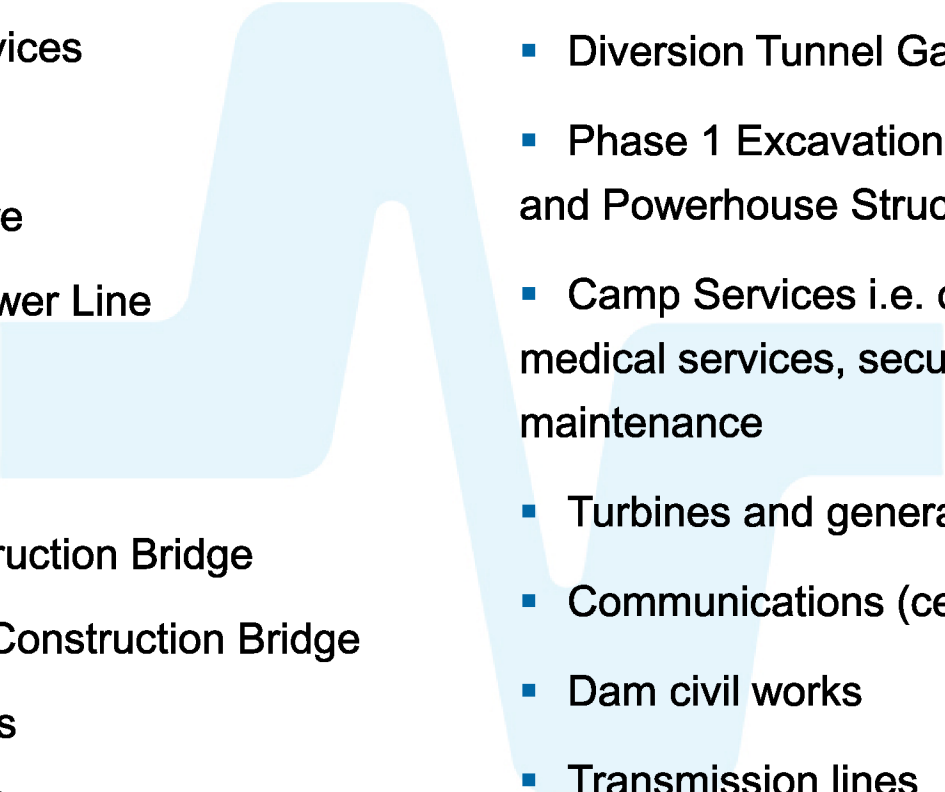


Detailed Contracting Plan

PO / Contract Approach

- Utilize intelligently sized, competitively bid fabrication / construction contracts (e.g. mixed model):
 - ❖ Best cost and schedule performance in today's market;
 - ❖ Best from a claims frequency perspective;
 - ❖ Construction related risks allocated to contractors;
 - ❖ Intelligent sizing can enable shared risk (i.e smaller contracts could be used).
- Limited contractors available with the required resources for very large scopes;
- Ensure contract size is manageable and does not exceed contractor capability;
- Contractors will not accept the risk associated with large EPC contracts.

Contract Plan – (Preliminary)

- 
- Engineering services
 - Camp
 - Site Infrastructure
 - Construction Power Line
 - Site Clearing
 - Access Roads
 - Purchase Construction Bridge
 - Construction of Construction Bridge
 - Barge & Services
 - Diversion Tunnel
 - Diversion Tunnel Gates and Guides
 - Phase 1 Excavation of Spillway, Intake and Powerhouse Structure
 - Camp Services i.e. catering, janitorial, medical services, security, transportation, maintenance
 - Turbines and generators
 - Communications (cell towers etc.)
 - Dam civil works
 - Transmission lines
 - HVdc specialties

Drivers for Start of Contracting Activities

- Best practical project definition & design basis in place;
- Identify contract & procurement packages;
- Develop contract strategies & contract plans with schedule to accommodate financial close requirements (Financial Close may require most contracts to be complete by project sanction);
- Identify package teams & support disciplines required to execute strategies;
- Need to stagger start of contracting activities to ensure schedule is maintained & workload distribution;
- Level of engineering required to support these activities;
- Financial Close may require most contracts to be complete.

Drivers for Start of Contracting Activities

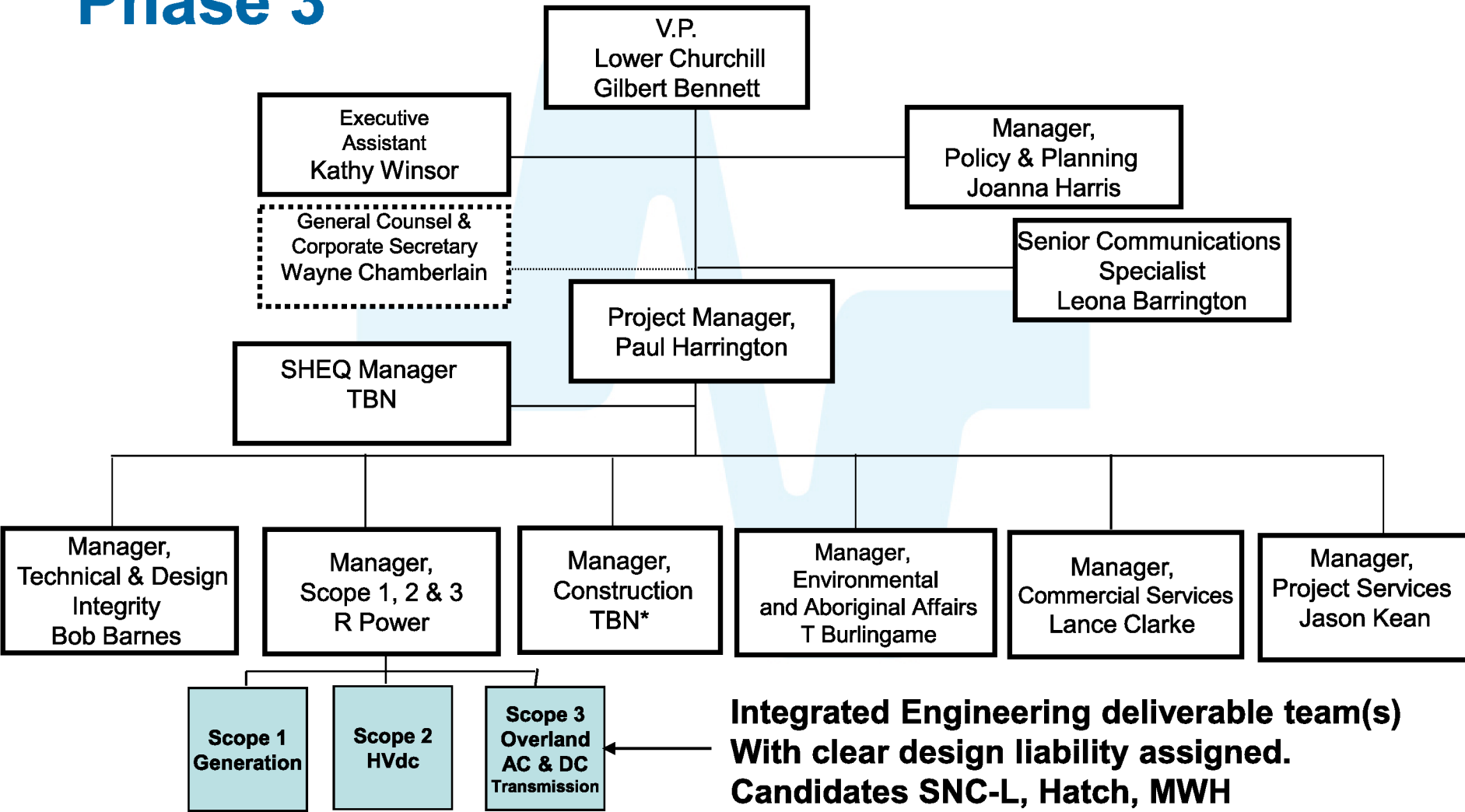
- Market Intelligence required
 - ❖ Identify potential contractors / vendors;
 - ❖ Vigorously sell / market the project (road shows);
 - ❖ Acquire delivery information;
 - ❖ Acquire information in support of estimate.
- Perform risk sharing analysis in support of contract packaging;
- Support other project activities i.e. study work;
- Upfront planning of activities;
- Develop logistics, expediting and inspection strategies.

Organization & office space

Organization - drivers

- NLH to manage the Project
- Need to engage engineering and support companies with strong reputations to give us the “name recognition”
- Integrated team with engineering liabilities clearly assigned
- Strong focus on cost, schedule, risk and quality
- FEL concept applied
- Must be focussed on deliverables – mainly PO’s and Contracts in Phase 3

Proposed Leadership Organization for Phase 3



Scope teams

Approx 40 to 60 People

**Scope 1
Generation**

**Lead
Discipline
& Package
engineers**

**Discipline Engineers
Technologists, drafting
Plus support ,
Admin staff**

Approx 10 to 20 People

**Scope 2
HVdc
Converter stations
Subsea**

**Lead
Discipline
& Package
engineers**

**Small team of
Discipline/package
engineers
Plus support ,
Admin staff**

Approx 40 to 60 People

**Scope 3
Overland
Transmission
AC & DC**

**Lead
Discipline
& Package
engineers**

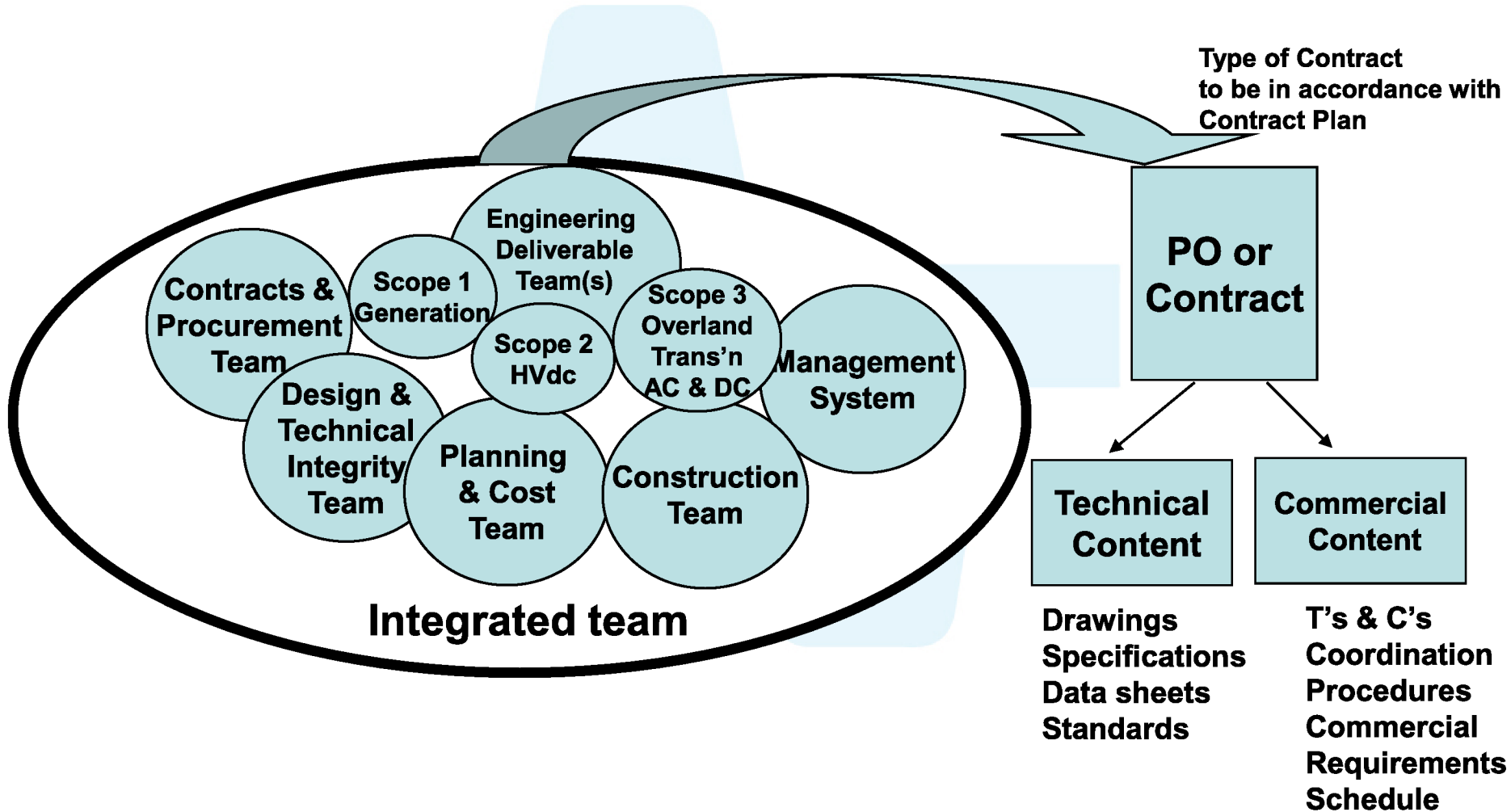
**Team of
Discipline/package
engineers
Plus support ,
Admin staff**

Approx 60 to 70 People

**Procurement, expediting, contracts
Planning /cost, DCC support**

Total Approx 150 to 200 People

Main Interactions and Interfaces of Integrated Team to Produce PO's and Contract's



Project Eng/Support Contractor(s) Scope Definition and Interfaces

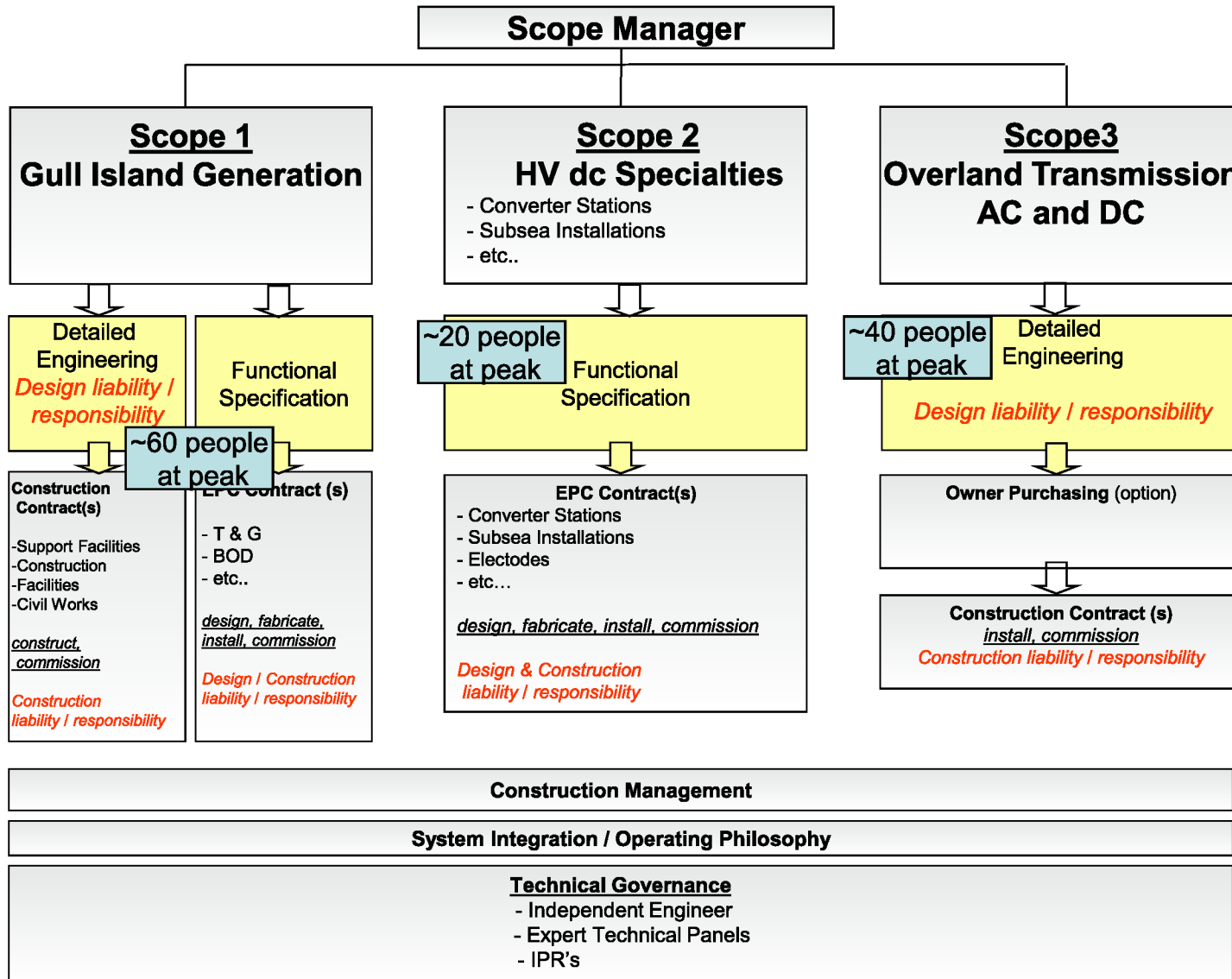
~200-250 people
at peak

"Best Person for the Job"

PSC(s) to supply staff in the following functions within the LCP team as required. Liabilities lie with Owner with regard to these functions.

- Project Controls
- Contracts
- Info. Management
- Benefits Monitoring
- Office Management
- Quality
- Safety
- Environmental
- Risk Management
- Labour Relations
- HR
- Construction Mgmt.
- Other ...

~70 people
at peak



Offices

- **The NLH team is ~ 60 people and the 5th floor is full, that will increase to ~ 90 by the Q3/4 2008**
- **We will soon not be able to house the LCP team on 5th and will need to find ~ 20 places**
- **The Scope teams from SNC-L and Hatch will be a further ~150 to 200 people at peak with ~ 60% in St John's**
- **A project office for ~ 200 people at peak will be required by mid/late 2008**
- **Project office would have to be an existing modified building**
- **We need to allow at 6 to 8 months to carryout office space modifications**

Checkpoint

- Organization and Offices
 - ❖ Are we aligned on Phase 3 integrated organization?
 - ❖ Do we have approval to engage SNC-L, Hatch and MWH to commence negotiations for potential phase 3 support?
 - ❖ Do we have approval to proceed with project office plans but not make commitments until we get the OK?

Lessons Learned

- Iceland – Owner’s construction mgmt. contractor (M&M) did not work – Owner ended up doing the work
- Iceland – engineering contractor was JV arrangement – Owner had issues with this arrangement
- Iceland – execution approach was to use many contracts of manageable size
- BC Hydro manage most construction – poor experience with construction management company
- MBH uses integrated team with KGS Acres - site team is mostly MBH staff
- Voisey’s Bay – risk shared among owner, consultants and contractors

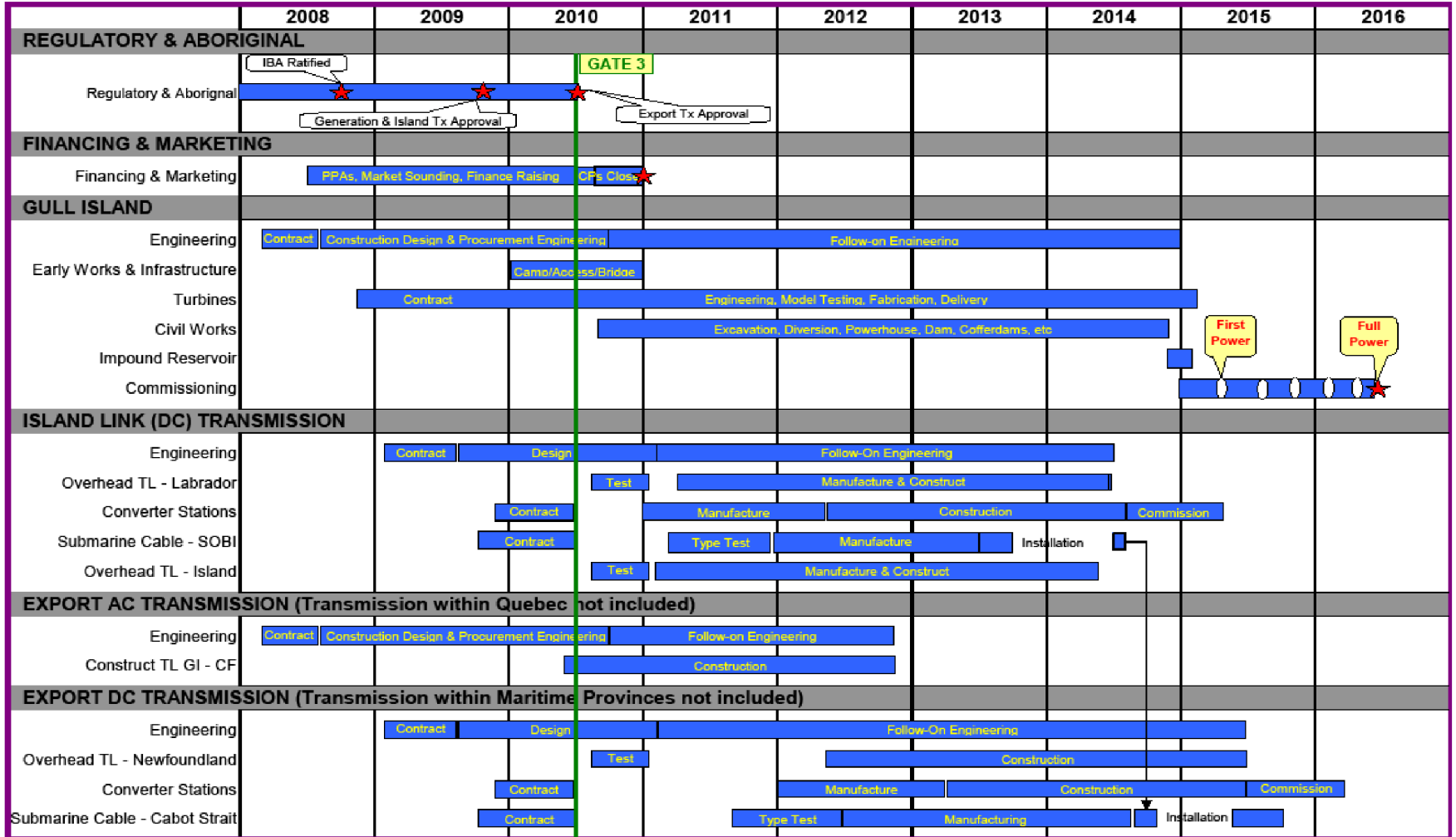
PC's LL's

- Engineering Quality key driver of project success.
- Establish early and maintain strong operator representation
- Centralize engineering early and avoid relocating – decision making authority is then “in-house” – more effective change management
- Recruit and retain local expertise
- Incorporate operability and maintainability in the design
- Define the project

Lessons Learned

- In last 5-10 years, mega hydro projects NOT fully managed by engineering companies (such as SNC) using traditional EPCM approach – rather companies such as SNC provide selected areas of expertise with Owner's integrated teams providing overall direction and control (at least it is not clear from the information we have).

Lower Churchill Project Master Plan



File: GEN-PJ-002 Level 0 Schedule

Doc. No. GEN-PJ-002, Rev A1, March 2008

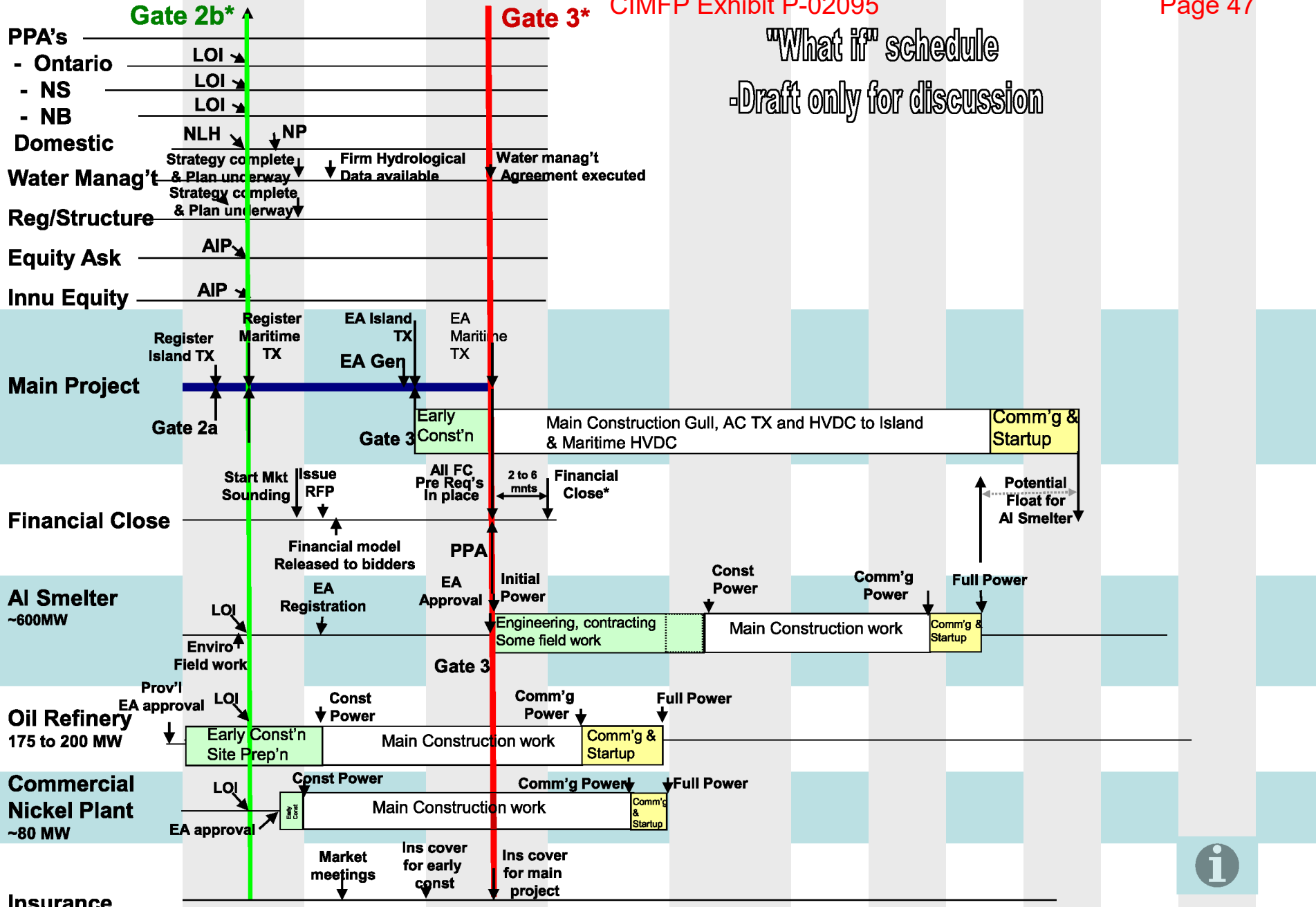
Line of Sight Master Schedule Gull Island, HVDC to Island and Maritimes

2008 2009 2010 2011 2012 2013 2014 2015 2016 2017 2018 2019

CIMFP Exhibit P-02095

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"What if" schedule
 - Draft only for discussion





Challenges

Challenges

■ Environment

- ❖ **EA Generation** already significantly delayed and could get dragged out even more
- ❖ **EA HVDC to island** - registration must be made by May 2008 to meet schedule
- ❖ **EA HVDC to export** – registration must be made by mid 2008 to meet a mid 2010 gate 3b
- ❖ **Government agencies** are not responsive to schedule concerns
- ❖ **Unreasonable demands** from some agencies e.g. DFO and HADD

Challenges

■ Engineering

- ❖ **Progress** is slow and some consultants not performing
- ❖ **Resource problems** with all Consultants
- ❖ **Need to get support contracts** with consultants in place to allow for:
 - ◆ **Establishing a Project office** and co locate as much as possible- i.e. shorten the communication lines
 - ◆ **Distribution of the work** into 3 streams Generation, HVDC, Transmission and possibly 3 Consultants
 - ◆ **Implementing the organizational design**

Challenges

■ Aboriginal

- ❖ **IBA progress** being made with IN at a slow pace
- ❖ **Other Aboriginal groups** are becoming involved e.g. Quebec Innu, LMN, Innuit and as proponent, there is no clear Government position to follow
- ❖ **Equity discussions** with Innu not leading to clear commitments
- ❖ **Community Consultations** are being led by IN

Challenges

■ Commercial

- ❖ **PTA exemption** is required this summer
- ❖ **Financing demands and long lead delivery times** have caused an acceleration of PO and Contracting with most contracts needed between late 2009 and Mid 2010.
- ❖ **Support Contractors** needed by mid 2008
- ❖ **Project office space** for 100 to 200 persons needed by mid 2008
- ❖ **Additional resources** from support contractors are needed urgently
- ❖ **Limited availability** of reliable consultants and consolidation of suppliers and contractors means we have to sell our project and start that urgently

Challenges

■ Project Services

- ❖ **Lack of robust corporate systems**, procedures and tools for mega project execution
- ❖ **Engineering and Environmental consultants** are poor at overall management, cost control , planning and scheduling and OH&S

Contracting Approaches

Project Execution / Contracting Approaches

The main contracting approaches used for large infrastructure projects (including hydroelectric) generally include:

- ❖ EPCM – Engineering, Procurement, Construction Management
- ❖ EPC – Engineer, Procurement, Construction
- ❖ Alliances
- ❖ Reimbursable
- ❖ variations of the above

EPCM

- EPCM – Engineering, Procurement, Construction Management
 - ❖ Multiple contracts are awarded and the co-ordination between the contracts is undertaken by an Engineering-Procurement-Construction Management team.
 - ❖ For optimal efficiency, the engineering group is incorporated into the team.
 - ❖ EPCM team could be Owner’s Agent (e.g. “engineering” company such as SNC who themselves would perform the engineering / technical requirements within the EPCM as well as PCM).
 - ❖ Some of the major equipment contracts are often awarded under a “detailed design, fabrication, delivery, installation, commissioning” arrangement) with intense involvement of EPCM team.

EPCM (cont'd.)

- EPCM, with varying levels of Owner participation, has been the traditional model of implementing many hydro projects in Canada, including NLH, with some deviations.
- In the last 10 years or so, other project execution approaches have been utilized, but hydro development is drifting back to the traditional EPCM approach.
- EPCM approach requires strong project management system / project controls (planning, cost control, procurement, value engineering).
- In more recent years, to reflect market reality that engineering companies do not now have the wherewithal for full EPCM services (most personnel utilized by eng. companies are project hires / consultants or JV partners), trend is for the Owner organization to become more of an EPCM organization for mega (including hydro) projects.

EPC

- EPC – Engineer, Procure, Construct (sometimes referred to as Turnkey or Design-Build)
 - ❖ Involves contracting all work (engineering, construction, supply and installation activities) for implementation of the entire project to EPC Contractor.
 - ❖ Owner provides only a conceptual layout of the project and the minimum requirements leaving the optimization and subsequent detailed design to the EPC contractor.
- EPC approach transfers risk to the EPC contractor

Alliances / Reimbursable

- Alliances – consortium of contractors working on reimbursable basis with umbrella incentive schemes
- Reimbursable - with or without incentive schemes

These arrangements have had poor cost and schedule performance and will not be considered for the LCP.

Driver Alignment Details

Alignment with Drivers

1. Project Management by Owner / Integrated Team Approach

- ❖ By its nature the Owner led integrated team will ensure FULL Owner involvement / control;
- ❖ Absolutely clear business and project objectives improve cost and schedule performance - best achieved with Owner driven Integrated Team which would provide clear understanding of what we are trying to achieve;
- ❖ Improved ability to include experienced plant (operations) personnel in the picture at all times – inclusion of Operations deemed “best value added”;
- ❖ Engineering within team increases management visibility;
- ❖ Owner will manage staffing - adequately staffed teams, in all functional areas, are successful / are predictable / lead to better project definition and good level of FEL;
- ❖ Promotes controlled integration of NLH staff into Project team – development of Project Management capability for future opportunities (hydropower and other areas);
- ❖ Better allows for NL engineers / other professionals to participate and to assume more key positions over time – less turnover of staff / continuity.

Alignment with Drivers (cont'd.)

3. Cost & Schedule Predictability

- ❖ Strong Owner-led Project Controls organization is essential for “real-time” cost and schedule control / predictability (recent stats indicate LS EPC arrangements tend to overrun considerably removing the predictability once perceived to be inherent in them).
- ❖ Improved cost performance is best achieved with Owner driven Integrated Team.
- ❖ Integrated team estimates can be vetted and estimate assurance built into the process rather than depending on external consultants, thus increasing comfort levels.

Alignment with Drivers (cont'd.)

4. High FEL / Achievement of Project Definition

- ❖ Strategy allows LCP team (rather than handing over this decision making to others) to set the schedule and define the level of definition that best fits:
 - ◆ moving through each gate
 - ◆ Contracting strategy for each package
- ❖ Integrated team facilitates construction / constructability reviews early - improves cost and schedule predictability.

Alignment with Drivers (cont'd.)

5. Optimal Allocation of Risk

- ❖ Strategy results in balanced / optimal allocation of risk and liability
 - ◆ realistic in today's market
 - ◆ forcing contractors to assume all financial risks / liabilities will preclude them bidding - in today's market environment not fully realistic or achievable.
- ❖ Design liability will be with engineering contractors
- ❖ Owner to accept much of the execution cost and schedule risk for engineering and construction management in EPCm anyway
- ❖ Risks can be mitigated with Independent Engineer / Expert Review Panels
- ❖ Risks for actual construction / fabrication will be with contractors.
- ❖ Integrated team approach better facilitates dynamic Owner driven Risk management process and techniques with full team involvement. Better enables culture that supports proactive risk management, particularly identification and management of opportunities.
- ❖ Integrated teams are less likely to experience claims.

Alignment with Drivers (cont'd.)

5. Optimal Allocation of Risk (cont'd.)

- ❖ Methods to assume risk (IPA)
 - ◆ Owner leads / performs risk id / analysis / methods;
 - ◆ Strong Owner project controls;
 - ◆ Detailed Owner cost estimate;
 - ◆ Interface management is led by Owner;
 - ◆ Active Owner involvement in planning for labour planning / sourcing.
- ❖ Mixed strategy is most cost effective.
- ❖ Owners pay a significant premium to transfer risk to EPC contracts – Contractors' financials cannot support the types of risks that Owners often ask them to carry.
- ❖ Careful contractor evaluation and selection mitigates the risk of contracting problems.
- ❖ Effective controls mitigate the risk of poor contractor performance.

Alignment with Drivers (cont'd.)

6. Alignment with contractor availability / capability (Contractor Appetite for Mega Projects)

- ❖ Strategy allows for “intelligent” sized contract packages given that there is major consolidation resulting in limited contractors and equipment suppliers
- ❖ Package sizing allows competitive bidding, thereby ensuring best value for the Owner from a quality, cost and schedule perspective.
- ❖ Owner control supports selling of the project through workshops, ads, etc.
- ❖ Major engineering contractors stretched thin – Creditworthiness and issue
- ❖ In more recent years, to reflect market reality that engineering companies do not now have the wherewithal for full EPCM services (most personnel utilized by eng. companies are project hires / consultants or JV partners), trend is for the Owner organization to become more of an EPCM organization for mega (including hydro) projects.

Alignment with Drivers (cont'd.)

Alignment with Provincial Policies / IBA Agreement

- ❖ Recommended strategy allows for best opportunity for achievement of benefits commitments as the Owner is part of the team developing the execution strategy.
- ❖ On the professional side, the strategy promotes opportunity for LCP to better avail of existing NL expertise and capability to further embellish the team (ref. offshore industry as an example wherein NL capability is now world-class).
- ❖ Provides opportunity to ensure maximum benefits for Aboriginal groups

Alignment with Drivers (cont'd.)

Flexibility to accept / manage change (e.g. alternate concepts)

- ❖ Model allows flexibility in early design stages.
- ❖ No serious contractual impacts to changes until construction contracts are entered into.

