Results of Time-Risk and Strategic-Risk Assessments September 2009

Risk Resolution®

Westney

Consulting Group, Inc.
www.westney.com

General Information

It is important to note that the scope of work for Westney Consulting Group was for Westney to guide and facilitate the Risk Ranging Process, using the consultants' experience to ask the right questions and, where appropriate, challenge the Nalcor participant's thinking. This resulted in an outcome of the analysis that represented the best thinking and efforts of both the Nalcor participants and the consultants from Westney.

Contents

Assessment Summary

Basis of Assessment

Project Components

The Lower Churchill Project is comprised of the following three main components:

1) the Gull Island 2,250 MW plant;
2) the 1,800 MW Island Link with submarine cables; and
3) the 1,000 MW Maritime Link.

Key Master Schedule Dates

Ready to Start Early Works Construction:	16-Jan-2011
Full Commercial Power:	30-Jun-2018

Assessment Results

Financial Exposure above Estimate and Tactical Risk

	P25 (mil)	P75 (mil)
Unmitigated Risk Exposure	$1,351	$1,818
Mitigated Risk Exposure*	$479	$828

*Includes mitigation costs of $80 - $154 mil.
All currency is in C$.

Time-Risk Exposure

	P25	P75
Ready to Start Early Works Construction	26-Apr-11	11-Jul-11
Full Commercial Power	10-Jul-19	12-Feb-20

Time-Risk Assessment

Basis of Assessment

Time-Risk Model

A revision to the 2008 Time-Risk model was developed using Microsoft Project that represents the dates, durations, and key dependencies (including weather modeling) in the current approved Project Master Schedule. The key activities were identified and framed by Nalcor.

Nalcor representatives met with Westney consultants at Westney's Houston office to discuss possible outcomes for each modeled activity. The final ranging was performed by the Nalcor team, but it was vetted and questioned by the Westney participants. The modeling simulation was performed by Westney using the @Risk Monte Carlo technique with 10,000 iterations.

Assessment Results

Time-Risk Results

The modeled results had a predictive range for Full Commercial Power approximately 12 to 20 months after the currently scheduled date of June 30, 2018.

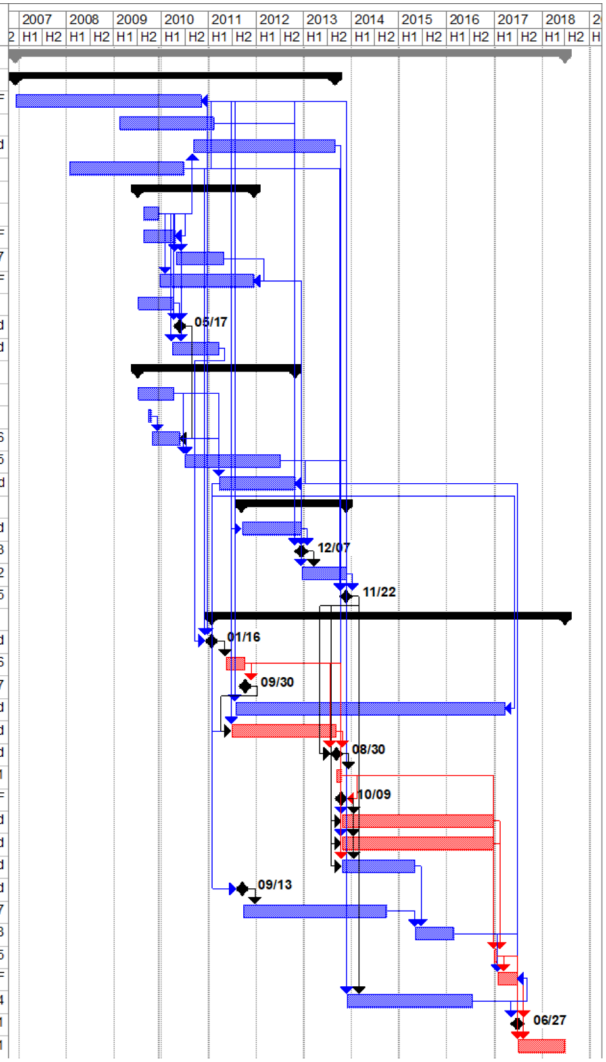
Predictive Range	
P25	P75
10-Jul-2019	12-Feb-2020

These results are driven by modeled delays in several key activities and the inability to complete work within tight weather windows, especially those in Gull Island Construction. The critical path In the simulation included Gull Island Construction activities over 90% of the time.

Time-Risk Model

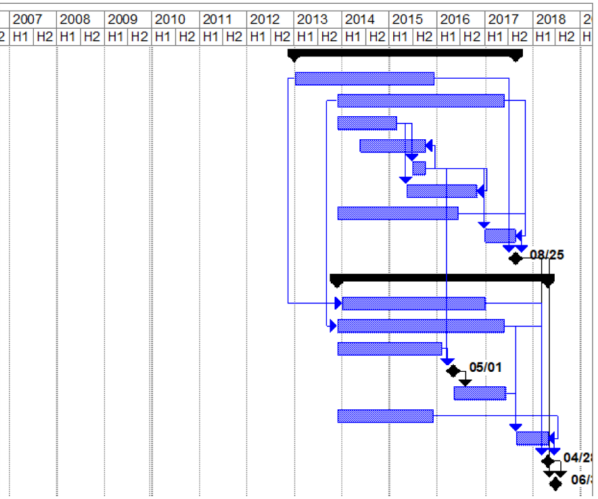
CIMFP Exhibit P-00904

ID	Name	Duration	Start	Finish	Predecessors
0	**Nalcor Energy - Lower Churchill Project**	**4230 d**	**12/01/06**	**06/30/18**	
1	**Environmental Assessment**	**2457 d**	**12/01/06**	**08/22/13**	
2	Generation EA	1432 d	12/01/06	11/01/10	5FF
3	Island Link EA	729 d	02/02/09	01/31/11	
4	Maritime Link EA	1096 d	08/23/10	08/22/13	7FS+261 d
5	Negotiate and Ratify IBA with Innu Nation	889 d	01/15/08	06/21/10	
6	**Power Sales and Market Access**	**887 d**	**07/01/09**	**12/04/11**	
7	Maritime Link Commerical Structure LOI	124 d	08/03/09	12/04/09	
8	LOIs with Anchor Customers - Maritimes	256 d	08/03/09	04/15/10	7FF
9	Negotiate and Execute Ownership Structure for Maritime Link	370 d	04/16/10	04/20/11	8,7
10	Negotiate and Execute PPA with Maritimes	730 d	12/05/09	12/04/11	7,9FF
11	Phase 2 Concept Optimization Studies (SOBI, etc.)	276 d	07/01/09	04/02/10	
12	Gate 2b	0 d	05/17/10	05/17/10	7FS+32 d,8FS+32 d,11FS+32 d
13	Engineering and Procurement for Early Works	365 d	03/17/10	03/16/11	7FS-30 d,8FS-30 d
14	**Engineering and Contracting**	**1209 d**	**07/01/09**	**10/21/12**	
15	Minimum Required Prep for Start of Engineering	276 d	07/01/09	04/02/10	
16	Decision on PM and Contracting Model	31 d	09/15/09	10/15/09	
17	Engineering RFP, Bidding and Award	215 d	10/16/09	05/18/10	12FF,16
18	Engineering & Detailed Design	738 d	06/17/10	06/23/12	17FS+29 d,15
19	Contractors & Vendors Bidding & Negotiations	584 d	03/18/11	10/21/12	18FF+120 d,15FS+273 d,17FS+302 d
20	**Project Financing**	**812 d**	**09/03/11**	**11/22/13**	
21	Finance Market Sounding and RFP	462 d	09/03/11	12/07/12	19FS-415 d
22	Final Disclosure	0 d	12/07/12	12/07/12	21,19,2,3
23	Final Proposal Review and Finalize Lender's Agreement	350 d	12/08/12	11/22/13	10,22
24	Financial Close	0 d	11/22/13	11/22/13	4,23,5
25	**Gull Island Construction**	**2723 d**	**01/16/11**	**06/30/18**	
26	Ready to Commence Early Infrastructure Works	0 d	01/16/11	01/16/11	2FS+42 d,5,13FS-60 d
27	Early Infrastructure Works - Bridge and Access (with weather window)	153 d	05/01/11	09/30/11	26
28	South Side Access Bridge Ready	0 d	09/30/11	09/30/11	27
29	Reservoir Clearing	2079 d	07/15/11	03/23/17	2FS+42 d,19SF-180 d
30	Diversion Inlet, Outlet and Tunnel Construction	800 d	06/23/11	08/30/13	2FS+42 d,28FS-100 d,19SS+90 d
31	Ready to Close River	0 d	08/30/13	08/30/13	30,27,24FS-90 d
32	Cofferdam Closure	40 d	08/31/13	10/09/13	31
33	River Diverted	0 d	10/09/13	10/09/13	32FF
34	Main Dam Construction - In-River (incl. Face Slab)	1170 d	10/10/13	12/22/16	33,19,24FS-90 d
35	Main Civil Structures Excavation and Construction Works Post Diversion	1170 d	10/10/13	12/22/16	33,19,24FS-90 d
36	Powerhouse & Penstocks Excavation and Concreting	570 d	10/10/13	05/02/15	27,33,19,24FS-90 d
37	Award Contract for T/G	0 d	09/13/11	09/13/11	19SS+180 d
38	Eng., Model Test, Manufacture and Deliver T/G Unit 1	1108 d	09/14/11	09/25/14	37
39	Installation of T/G Unit 1 and Services	300 d	05/03/15	02/26/16	36,38
40	Reservoir Impoundment	28 d	12/23/16	01/28/17	32,34,35
41	Commission T/G Unit 1 & Services	150 d	01/29/17	06/27/17	39,40,42FF
42	735kV HVac TL to CF and CF Switchyard Construct	969 d	11/23/13	07/18/16	2FS+42 d,18,19FS+60 d,24
43	First Power	0 d	06/27/17	06/27/17	42,41
44	Complete Installation & Commissioning - Units 2-5	368 d	06/28/17	06/30/18	19,39,40,41



Time-Risk Model (continued)

ID	Name	Duration	Start	Finish	Predecessors
45	**Island Link Construction**	**1707 d**	**12/23/12**	**08/25/17**	
46	HVdc TL Overland Construction - GI to Soldier's Pond	1080 d	12/23/12	12/07/15	18,19FS+62 d,3FS+44 d,5
47	Soldier's Pond and Gull Island Converter Stations	1280 d	11/23/13	05/25/17	3FS+42 d,24,5,19FS+60 d
48	SOBI Cable Manufacturing	462 d	11/23/13	02/27/15	24,18,19
49	SOBI Cable Landfall and Protection	510 d	05/14/14	10/05/15	3FS+42 d,50FF
50	SOBI Cable Installation (with weather window)	113 d	06/15/15	10/05/15	48,11,18
51	SOBI Cable Protection	368 d	05/01/15	10/31/16	11,18,19,48,50FF+90 d
52	Island System Upgrades and Reinforcements	924 d	11/23/13	06/03/16	3FS+42 d,24,18,19
53	System Testing and Commissioning	246 d	12/23/16	08/25/17	50,52FF+92 d,47FF+92 d,43FF,51
54	Island Link Ready for Power	0 d	08/25/17	08/25/17	46,53
55	**Maritime Link Construction**	**1618 d**	**11/23/13**	**04/28/18**	
56	HVdc TL Construct - TB to CR, Lingan to NB Border	1108 d	12/28/13	01/08/17	4FS+42 d,24,46SS+370 d,5,9,18,19
57	NB Converter Station Supply and Install	1280 d	11/23/13	05/25/17	4FS+42 d,24,47SS,5,19,9,18
58	Cabot Strait Cable Manufacturing	800 d	11/23/13	01/31/16	4,24,5,9,18,19
59	Ready to Install Cabot Strait Cable	0 d	05/01/16	05/01/16	58FS-91 d,4FS+42 d,50FS+16 d,9,18,19
60	Cabot Strait Cable Installation (with weather window)	206 d	05/01/16	06/07/17	59
61	Maritime System Upgrades and Reinforcements	738 d	11/23/13	11/30/15	4FS+42 d,24,9,18,19
62	System Testing and Commissioning	246 d	08/26/17	04/28/18	61FF+90 d,57FS+92 d,60
63	Maritime Link Ready for Power	0 d	04/28/18	04/28/18	57,62,56,54
64	Full Commercial Power	0 d	06/30/18	06/30/18	44,43,54,63



Time-Risk Ranging

Lower Churchill Project Time-Risk Assessment

Ranging Sheet - Base Case

		Time-Risk Model			Risk Ranges (changes in months)	
ID	Task Description	Duration	Start	Finish	Best	Worst
01	**Environmental Assessment**	**2457 d**	**1-Dec-06**	**22-Aug-13**		
02	Generation EA	1432 d	1-Dec-06	1-Nov-10	3	9
03	Island Link EA	729 d	2-Feb-09	31-Jan-11	3	8
04	Maritime Link EA	1096 d	23-Aug-10	22-Aug-13	0	6
05	Negotiate and Ratify IBA with Innu Nation	889 d	15-Jan-08	21-Jun-10	-4	2
06	**Power Sales and Market Access**	**887 d**	**1-Jul-09**	**4-Dec-11**		
07	Maritime Link Commerical Structure LOI	124 d	3-Aug-09	4-Dec-09	0	9
08	LOIs with Anchor Customers - Maritimes	256 d	3-Aug-09	15-Apr-10	-3	6
09	Negotiate and Execute Ownership Structure for Maritime Link	370 d	16-Apr-10	20-Apr-11	-2	6
10	Negotiate and Execute PPA with Maritimes	730 d	5-Dec-09	4-Dec-11	-6	3
11	Phase 2 Concept Optimization Studies (SOBI, etc.)	276 d	1-Jul-09	2-Apr-10	0	4
12	**Gate 2b**	**0 d**	**17-May-10**	**17-May-10**		
13	Engineering and Procurement for Early Works	365 d	17-Mar-10	16-Mar-11	-2	2
14	**Engineering and Contracting**	**1209 d**	**1-Jul-09**	**21-Oct-12**		
15	Minimum Required Prep for Start of Engineering	276 d	1-Jul-09	2-Apr-10	0	4
16	Decision on PM and Contracting Model	31 d	15-Sep-09	15-Oct-09	0.5	2.5
17	Engineering RFP, Bidding and Award	215 d	16-Oct-09	18-May-10	-1	1
18	Engineering & Detailed Design	738 d	17-Jun-10	23-Jun-12	-2	2
19	Contractors & Vendors Bidding & Negotiations	584 d	18-Mar-11	21-Oct-12	-2	2
20	**Project Financing**	**812 d**	**3-Sep-11**	**22-Nov-13**		
21	Finance Market Sounding and RFP	462 d	3-Sep-11	7-Dec-12	-3	0
22	**Final Disclosure**	**0 d**	**7-Dec-12**	**7-Dec-12**		
23	Final Proposal Review and Finalize Lender's Agreement	350 d	8-Dec-12	22-Nov-13	-6	6
24	**Financial Close**	**0 d**	**22-Nov-13**	**22-Nov-13**		

Time-Risk Ranging

Lower Churchill Project Time-Risk Assessment

Ranging Sheet - Base Case

		Time-Risk Model			Risk Ranges (changes in months)	
ID	Task Description	Duration	Start	Finish	Best	Worst
25	**Gull Island Construction**	**2723 d**	**16-Jan-11**	**30-Jun-18**		
26	**Ready to Commence Early Infrastructure Works**	**0 d**	**16-Jan-11**	**16-Jan-11**		
27	Early Infrastructure Works - Bridge and Access (with weather window	153 d	1-May-11	30-Sep-11	0	2
28	**South Side Access Bridge Ready**	**0 d**	**30-Sep-11**	**30-Sep-11**		
29	Reservoir Clearing	2079 d	15-Jul-11	23-Mar-17		
30	Diversion Inlet, Outlet and Tunnel Construction	800 d	23-Jun-11	30-Aug-13	-3	2
31	**Ready to Close River**	**0 d**	**30-Aug-13**	**30-Aug-13**		
32	Cofferdam Closure	40 d	31-Aug-13	9-Oct-13	-1	0
33	**River Diverted**	**0 d**	**9-Oct-13**	**9-Oct-13**		
34	Main Dam Construction - In-River (incl. Face Slab)	1170 d	10-Oct-13	22-Dec-16	-3	6
35	Main Civil Structures Excavation and Construction Works Post Divers	1170 d	10-Oct-13	22-Dec-16	-3.5	10
36	Powerhouse & Penstocks Excavation and Concreting	570 d	10-Oct-13	2-May-15	-2	4
37	**Award Contract for T/G**	**0 d**	**13-Sep-11**	**13-Sep-11**		
38	Eng., Model Test, Manufacture and Deliver T/G Unit 1	1108 d	14-Sep-11	25-Sep-14	-2	6
39	Installation of T/G Unit 1 and Services	300 d	3-May-15	26-Feb-16	-1	4.5
40	Reservoir Impoundment	28 d	23-Dec-16	28-Jan-17	1*	2*
41	Commission T/G Unit 1 & Services	150 d	29-Jan-17	27-Jun-17	-1	4
42	735kV HVac TL to CF and CF Switchyard Construct	969 d	23-Nov-13	18-Jul-16	-8.5	7
43	**First Power**	**0 d**	**27-Jun-17**	**27-Jun-17**		
44	Complete Installation & Commissioning - Units 2-5	368 d	28-Jun-17	30-Jun-18	-2.5	7.5

* Duration for reservoir impoundment in Monte Carlo simulation depends on time of year when activity takes place; a calendar with water flow rates is used to determine activity duration instead of sampling from a probability distribution.

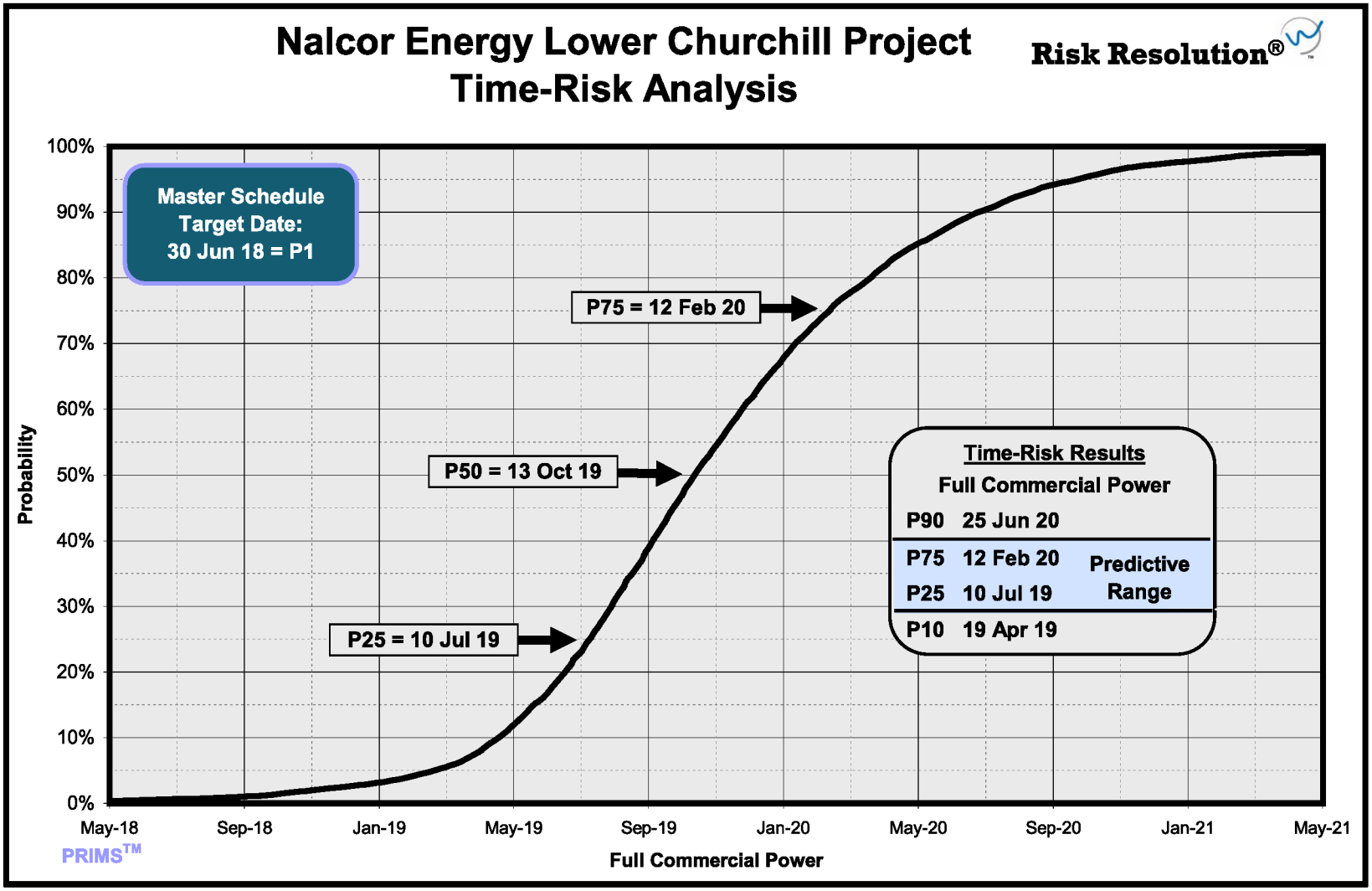
Time-Risk Ranging

Lower Churchill Project Time-Risk Assessment

Ranging Sheet - Base Case

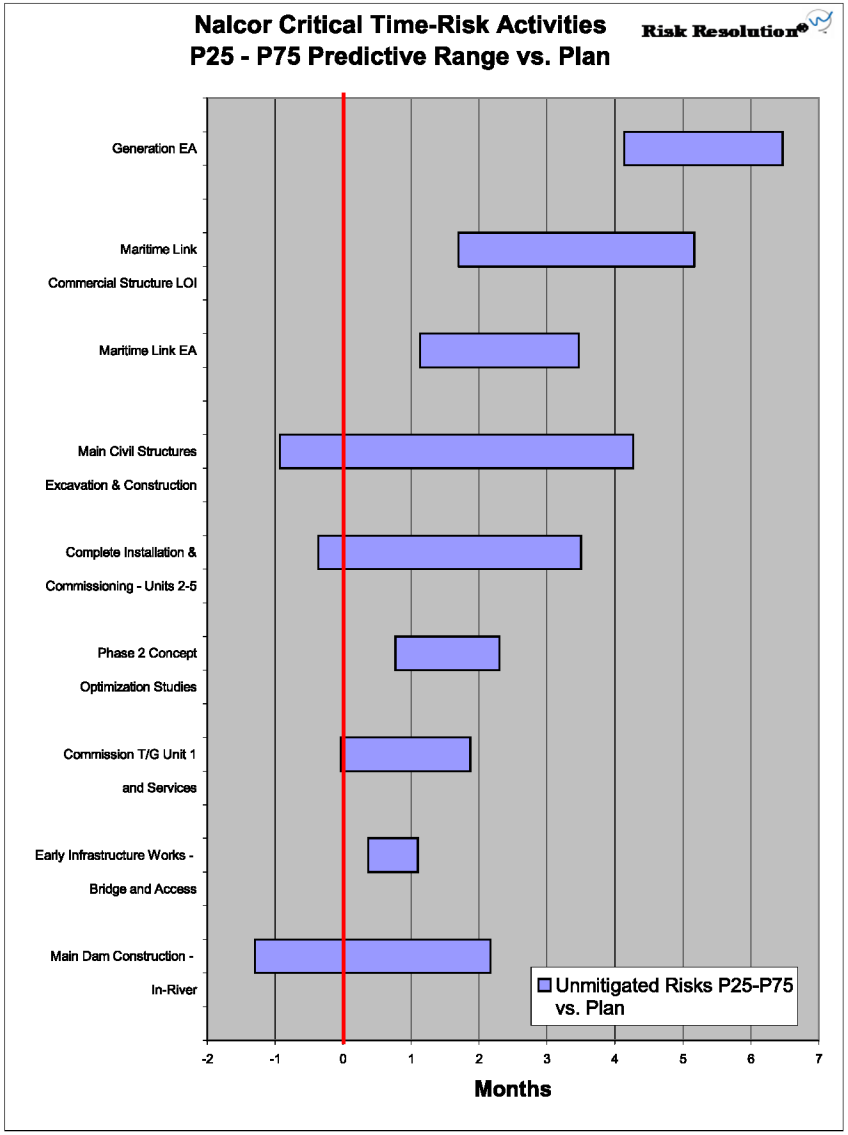
		Time-Risk Model			Risk Ranges (changes in months)	
ID	Task Description	Duration	Start	Finish	Best	Worst
45	**Island Link Construction**	**1707 d**	**23-Dec-12**	**25-Aug-17**		
46	HVdc TL Overland Construction - GI to Soldier's Pond	1080 d	23-Dec-12	7-Dec-15	-4	12
47	Soldier's Pond and Gull Island Converter Stations	1280 d	23-Nov-13	25-May-17	-6	5.5
48	SOBI Cable Manufacturing	462 d	23-Nov-13	27-Feb-15	-3	4.5
49	SOBI Cable Landfall and Protection	510 d	14-May-14	5-Oct-15	-1	8
50	SOBI Cable Installation (with weather window)	113 d	15-Jun-15	5-Oct-15	-1	1.5
51	SOBI Cable Protection	368 d	1-May-15	31-Oct-16	-2.5	4.5
52	Island System Upgrades and Reinforcements	924 d	23-Nov-13	3-Jun-16	-12	3
53	System Testing and Commissioning	246 d	23-Dec-16	25-Aug-17	-2	6
54	**Island Link Ready for Power**	**0 d**	**25-Aug-17**	**25-Aug-17**		
55	**Maritime Link Construction**	**1618 d**	**23-Nov-13**	**28-Apr-18**		
56	HVdc TL Construct - TB to CR, Lingan to NB Border	1108 d	28-Dec-13	8-Jan-17	-6	3
57	NB Converter Station Supply and Install	1280 d	23-Nov-13	25-May-17	-9.5	2
58	Cabot Strait Cable Manufacturing	800 d	23-Nov-13	31-Jan-16	-1	3
59	**Ready to Install Cabot Strait Cable**	**0 d**	**1-May-16**	**1-May-16**		
60	Cabot Strait Cable Installation (with weather window)	206 d	1-May-16	7-Jun-17	-1.5	2
61	Maritime System Upgrades and Reinforcements	738 d	23-Nov-13	30-Nov-15	-12	3
62	System Testing and Commissioning	246 d	26-Aug-17	28-Apr-18	-2	6
63	**Maritime Link Ready for Power**	**0 d**	**28-Apr-18**	**28-Apr-18**		
64	**Full Commercial Power**	**0 d**	**30-Jun-18**	**30-Jun-18**		
	Last Line					

Time-Risk Assessment Results



Time-Risk Tornado Chart

CIMFP Exhibit P-00904



Predictive Range vs. Schedule (Months)

Schedule Activities with Significant Time Risk

The analysis shows that these seven activities have the greatest impact on project timing and, therefore, should receive considerable attention.

	Months P25*	Months P75*
≈ Phase 2 Concept Optimization Studies	1	2.5
≈ Generation EA	4	6.5
≈ Maritime Link Comm. Struct. LOI	1.5	5
≈ Maritime Link EA	1	3.5
≈ Main Civil Str. Excav. & Con.	-1	4.5
≈ Complete Install. & Comm.	-0.5	3.5
≈ Comm. T/G Unit 1 & Serv.	0	2

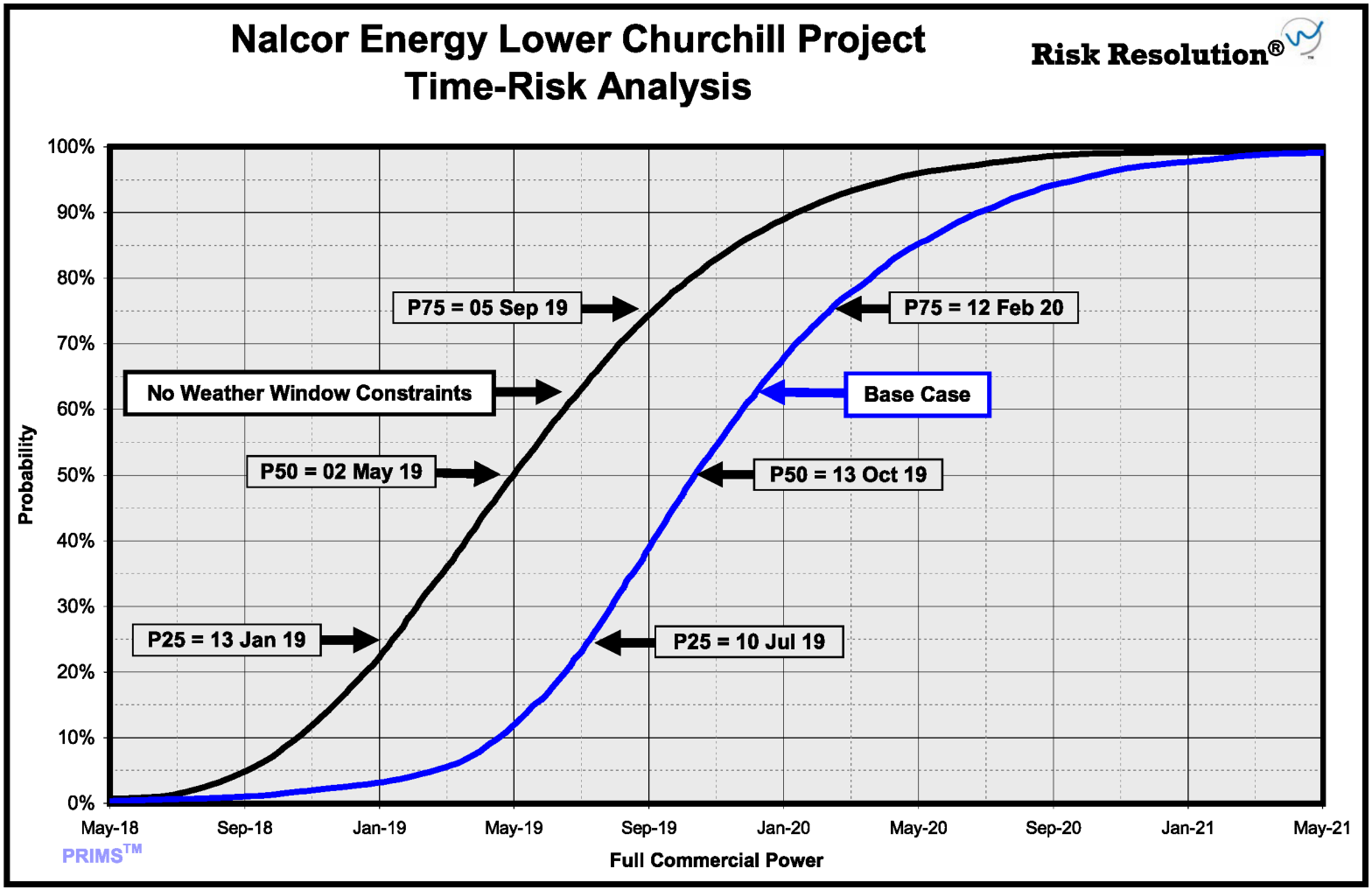
Additional Impact of Weather Window Constraints

≈ Weather Window	5.5	6

Base Case Predictive Range vs. Plan:
P25 = 12.5 months and P75 = 19.5 months

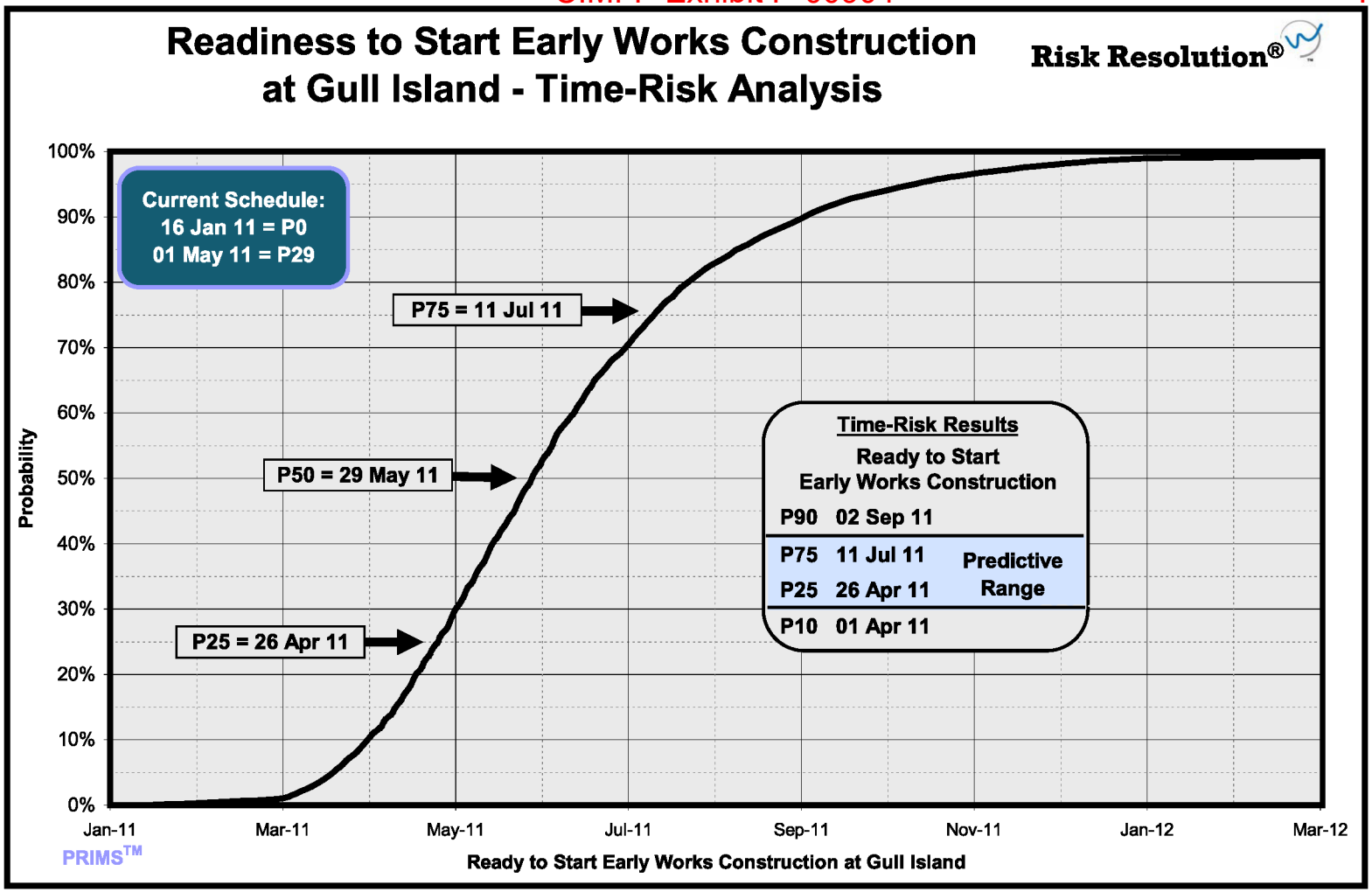
***Values may not be added to give total exposure.**

Effect of Weather Window Constraints



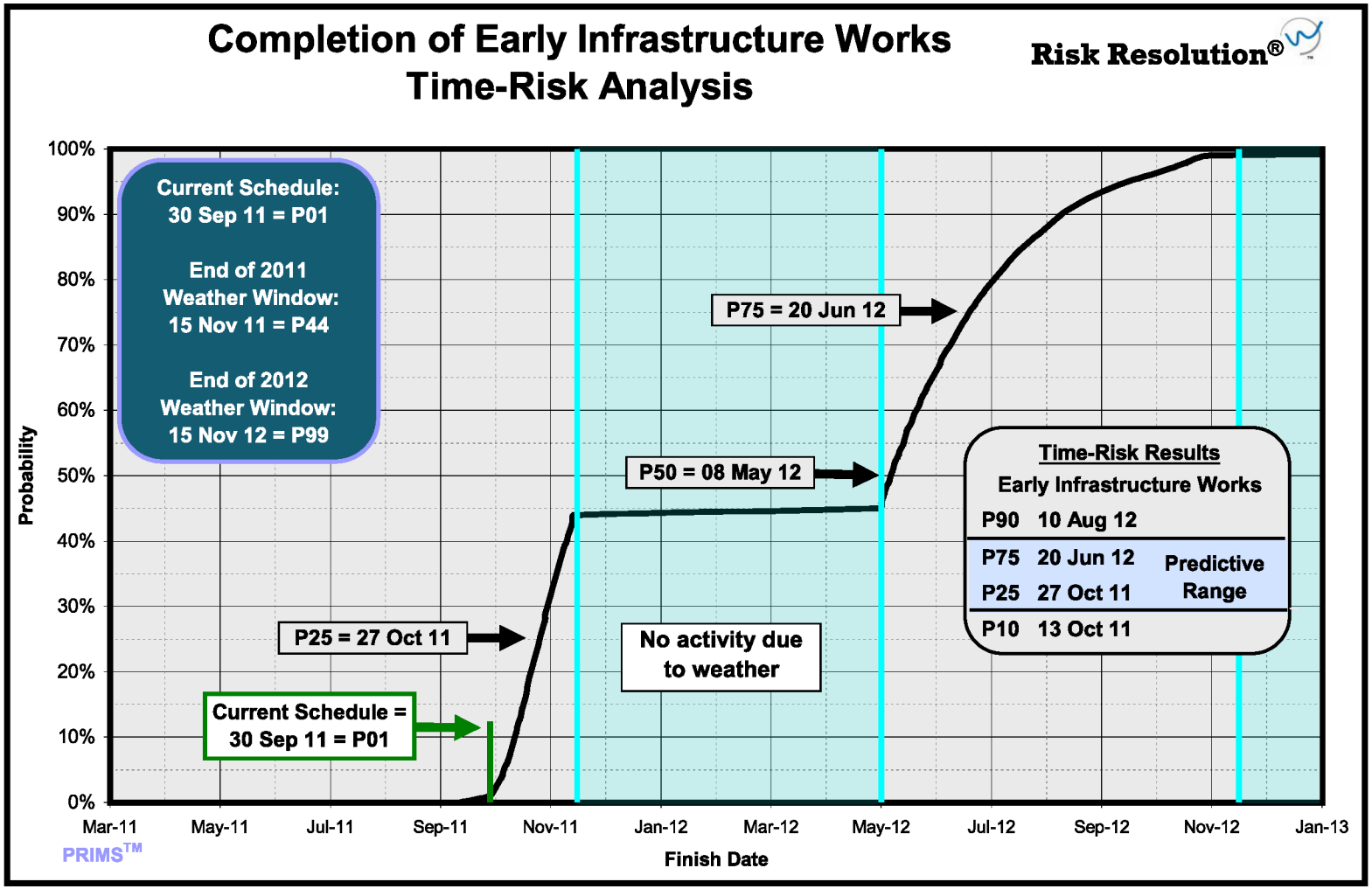
Even without weather constraints, the analysis suggests that the probability of having full commercial power by the Master Schedule target date of June 30, 2018, is less than 5%.

Gull Island Early Works Construction



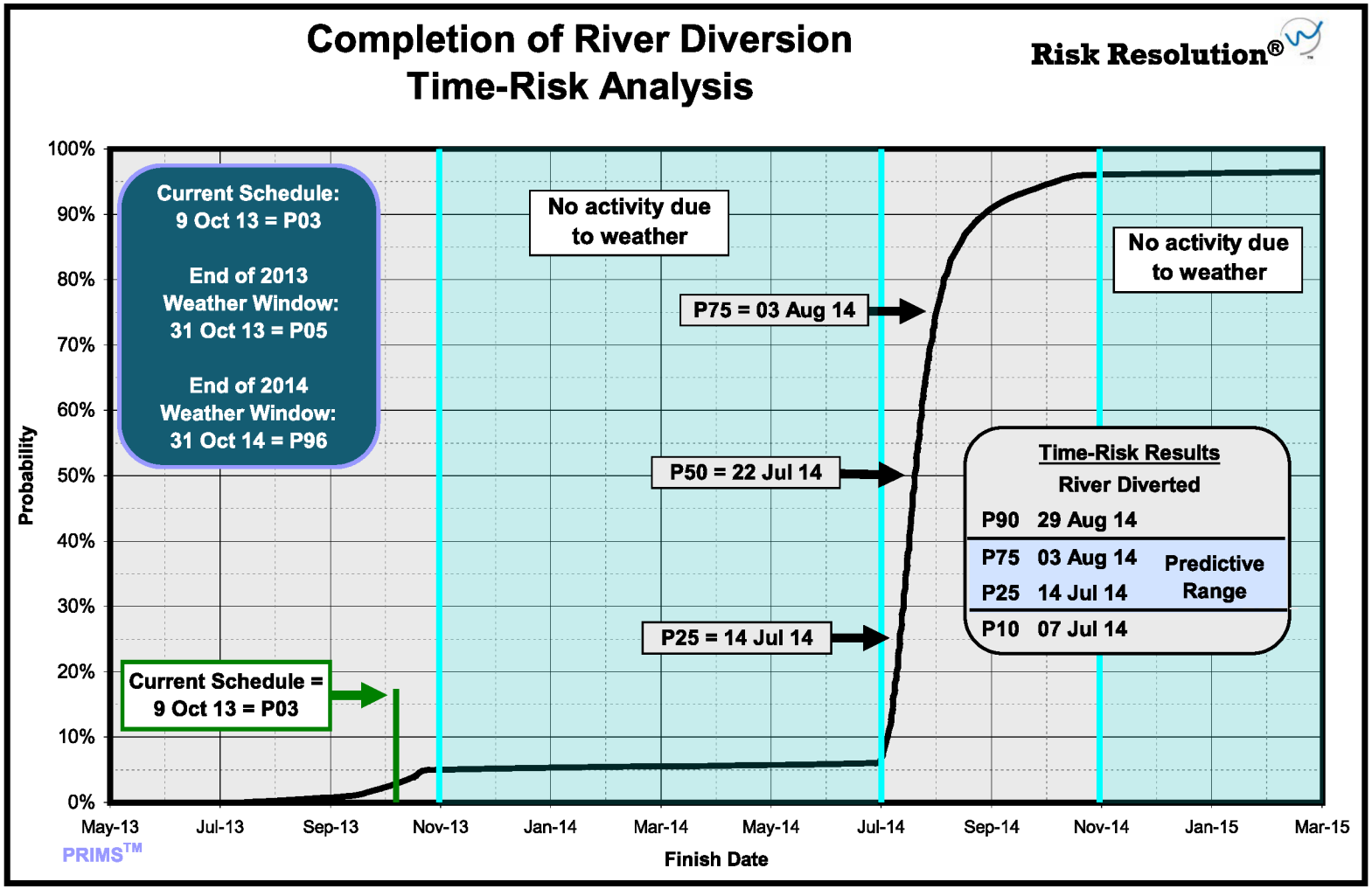
In this analysis, the timing of the milestone Ready to Commence Early Infrastructure Works is largely driven by the predecessor activities Generation EA Approval and the Completion of Engineering and Procurement Required for Early Works.

Gull Island Construction



In this analysis, the weather window constraint has a significant impact on the timing of the Completion of Early Infrastructure Works.

Gull Island River Diversion



For the purpose of this analysis, the milestone River Diversion is constrained by Financial Close.

Strategic-Risk Assessment

Basis of Assessment

The Strategic-Risk Assessment does not consider the impact of tactical risks (i.e., estimate contingency) on the costs of the Lower Churchill Project. This assessment dealt solely with Capex issues; revenue and Opex issues were noted for the economic model.

The strategic risks were identified and framed by the Nalcor team and verified with the LCP Risk Resolution Team. Nalcor representatives met with Westney consultants at Westney's Houston office to discuss possible outcomes for both the Unmitigated and Mitigated cases. The final ranging was by the Nalcor team, but it was vetted and questioned by the Westney participants. The Monte Carlo simulation was performed by Westney.

Assessment Results

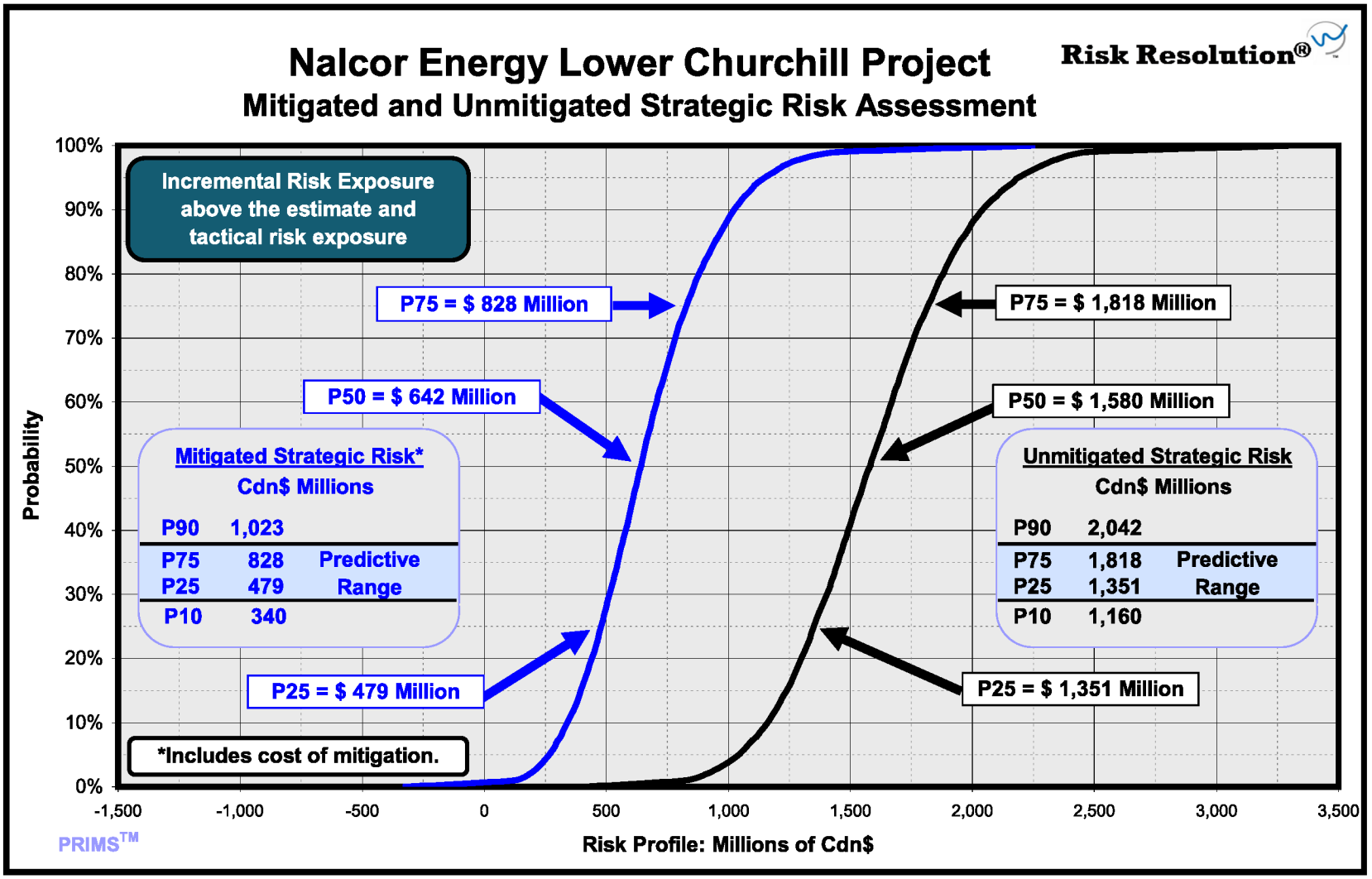
Strategic Risk Exposure

The Strategic Risk Exposure is the range of the costs that might be incurred that currently would not be incorporated into the estimate. A decision will be required as to whether these risks become costs in the estimate or remain as Risk Exposure above the estimate.

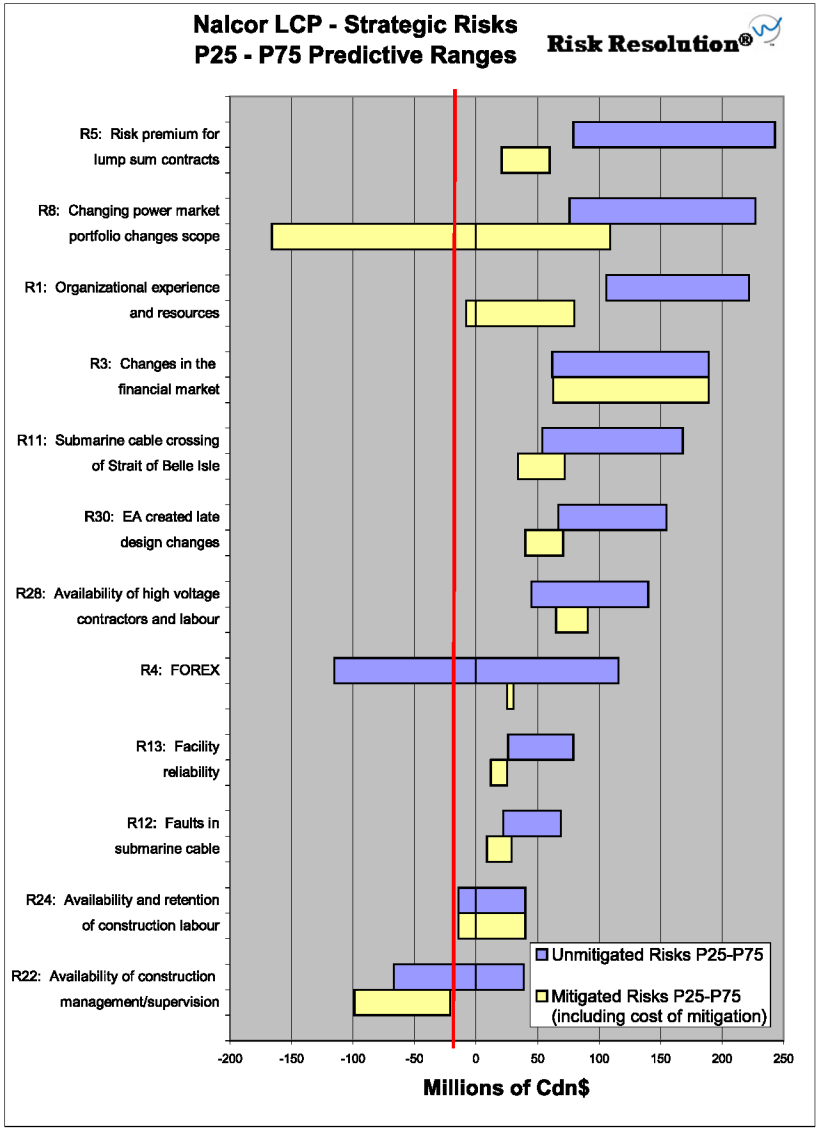
	Predictive Range	
	P25 (mil)	P75 (mil)
Unmitigated Risk Exposure	$1,351	$1,818
Mitigated Risk Exposure*	$479	$828

*Includes mitigation costs of $80 - $154 mil.
All currency is in C$.

Strategic-Risk Exposure



Strategic-Risk Tornado Chart



Strategic-Risk Exposure

All Values in C$ Millions

Mitigated Strategic Risks with Significant Impact

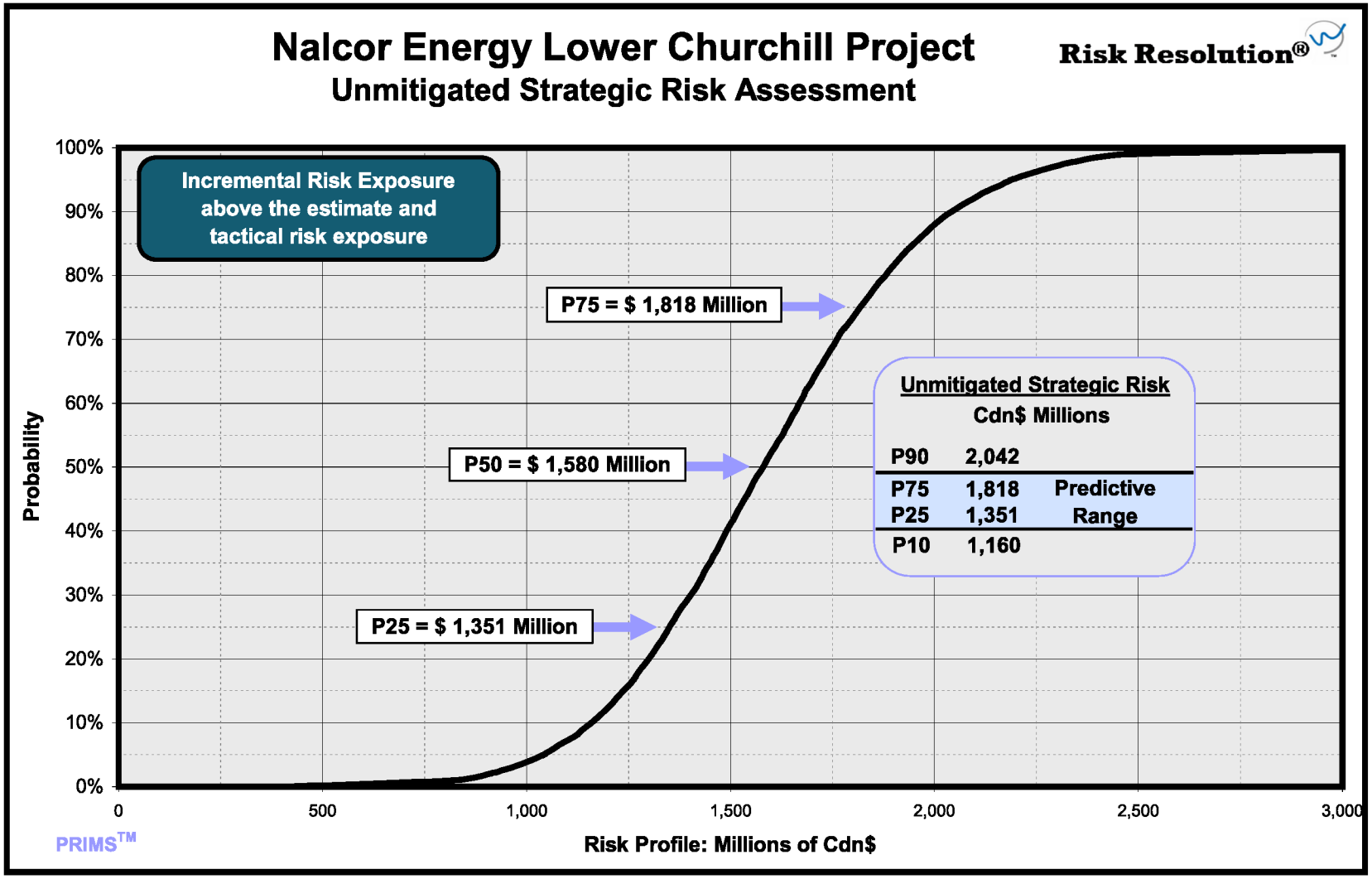
Mitigated Predictive Range (P25 to P75)

	P25*	P75*
≈ Changes in Financial Market	63	189
≈ Power Market Required Changes	-166	109
≈ Transmission Workforce	65	91
≈ Organizational Capacity	-8	80
≈ Strait of Belle Isle Crossing	34	72
≈ EA's cause design changes	40	71
≈ Lump Sum Risk Premiums	21	60

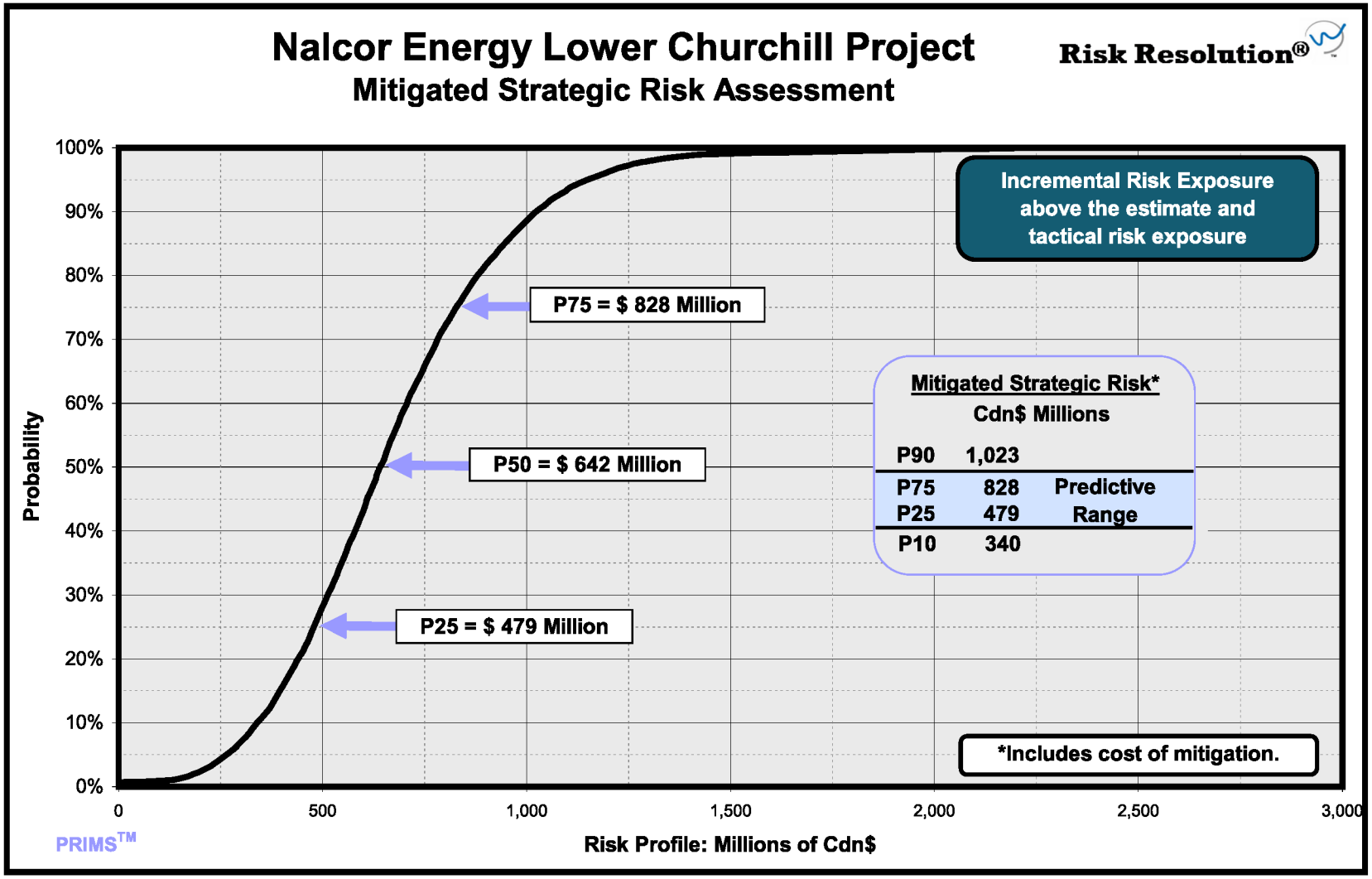
Project Mitigated Risk Exposure
Predictive Range: P25 = $479 to P75 = $828

***Values may not be added to give total exposure.**

Unmitigated Risk Exposure



Mitigated Risk Exposure



Strategic Risks Considered in Analysis

Key Risks / Potential Benefits

Bold Comments are Mitigations

Impact (Millions)
Unmitigated
Mitigated
Cost of Mitigation

Organizational Risks

1 Organizational experience and resources for a project of this size

- Processes, Resources, and Governance
- Specific experience of large hydro project
- **Mitigation represents early and aggressive effort to address each issue**
  - **Recruiting experienced people**
  - **Installing best of practice processes and governance**
  - **Plans to secure experienced consultants and contractors**

$50 to $350
-$50 to $175
$0

Interface Risks

2 Time required under Crown Corporation rules to gain approval

- Delayed decisions leading to schedule slippage and cost increases
- Loss of vendor and contractor interest
- Loss of team morale
- **Mitigation - Communicate impact of issue to stakeholders and proactively work at executive level**

$18 to $48
$9 to $24
$0

Financial Risks

3 Changes in the financial market

- Increased interest rate spreads
- Preferred financing instruments may not be available in quantities or on terms and conditions projected
- **Little mitigation possible**

$0 to $330
$0 to $330
$0

Strategic Risks Considered in Analysis

Key Risks / Potential Benefits

Bold Comments are Mitigations

Impact (Millions)
Unmitigated
Mitigated
Cost of Mitigation

Financial Risks

4 Foreign currency exchange risk

- Approximately $2.8 B of estimate is in non-CAD $ expenditures (e.g., U.S., Kroner, Euro)
- Potential for 10% swing in exchange rates
- **Mitigated Case assumes hedging of all currency risks**

-$280 to $280
$0
$28

5 Risk Premium for obtaining lump sum contracts

- Market shifting from seller's market to buyer's market for contractors and vendors
- Contractor and vendor creditworthiness continues to be a concern for potential financiers
- **Reduce exposure by using independent risk brokering to improve risk allocation and/or increase equity contribution**

$0 to $420
$0 to $100
$2

Commercial Risks

6 Extra year required to secure long-term PPA's

- Concern about time to secure agreements to support financial close
- **Mitigate potential exposure by awarding engineering contract at Gate 2b only when clarity on market access is available**
- **Risk is not entirely within Nalcor's control, thus some acceptance of this risk is required**

$24 to $54
$0 to $24
$5

Strategic Risks Considered in Analysis

Key Risks / Potential Benefits

Bold Comments are Mitigations

Impact (Millions)
Unmitigated
Mitigated
Cost of Mitigation

Commercial Risks

7 Federal government support for generation and transmission projects

- Federal government visible support of the project in any form would benefit the confidence in the market that the project will proceed
- **Active pursuit of support by executive management**

Not quantified in analysis

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8 Changing power market portfolio requires changes in project scope

- The power market for this project could influence new routes and capacities for power sales
- **Mitigate by engaging counterparties and validating project scope assumptions ASAP and maximizing Front-End Loading prior to sanction**

$0 to $400
-$300 to $400
$2

HSE Risks

9 Good HSE record is critical for project success

- Remote and difficult site
- Multiple work faces
- Potential for contamination of river
- **Mitigation includes early and proactive program to promote and secure commitment to best practices**
- **Engage and retain contractors who are leaders in safety performance**

$0 to $100
$5 to $25
$15

Strategic Risks Considered in Analysis

Key Risks / Potential Benefits

Bold Comments are Mitigations

Impact (Millions)
Unmitigated
Mitigated
Cost of Mitigation

Engineering / Technical Risks

10 Availability of resources to achieve a quality design

- Limited capacity within NL for hydro, resulting in need to mobilize resources outside the Province
- Hydro design market level of demand not seen since 1988
- Many reductions in hydro engineering resources in last decade
- **Mitigations include:**
  - **Taking early and aggressive action to secure required engineering competencies and resources**
  - **Scheduling sufficient time for engineering completion prior to start of construction**
  - **Implementing a project-wide Quality Management System and embed QA requirements in all contracts**

$20 to $70
-$10 to $10
$0

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11 Submarine cable crossing of Strait of Belle Isle

- Many firsts:
  - Buried shore approaches due to icebergs
  - Weather window very short
  - Sea currents at 5 to 7 knots will be very challenging
  - Viability of trenching technology is questionable
  - Limited capacity of installation vessels
- **Mitigations include:**
  - **Evaluate all available opportunities as soon as possible**
  - **Engage best consultants for subsurface conditions**
  - **Additional studies, particularly on trenching technology**

$0 to $290
$0 to $100
$15

Strategic Risks Considered in Analysis

Key Risks / Potential Benefits

Bold Comments are Mitigations

		Impact (Millions) Unmitigated / Mitigated / Cost of Mitigation
Engineering / Technical Risks		
12 **Faults in submarine cable during commissioning and post installation**	– Recent installations in Europe experiencing faults – Faults in buried Belle Isle section expensive to repair – **Mitigations include using a conservative, robust design** – **Using lessons learned from recent installations** – **Evaluating insurance coverage**	**$0 to $120** **$0 to $50** $0
13 **System reliability during commissioning and start-up**	– Many hydro projects have had reliability issues in recent years – **Engage experienced engineering contractors** – **Conduct system studies** – **Consider commercial insurance products**	**$0 to $140** **$0 to $35** $5
Environmental Approvals & Permitting Risks		
14 **Securing generation project release from Environmental Assessment**	– Highly problematic • Regulators decision-making process • Use of process to protest project • Alternatives requested – **Bolster team resources to allow for efficient management and support of the EA process** – **Step up consultation efforts, esp. w/ aboriginal groups**	**$30 to $58** **$0** $2 to $10

Strategic Risks Considered in Analysis

Key Risks / Potential Benefits

Bold Comments are Mitigations

Impact (Millions)
Unmitigated
Mitigated
Cost of Mitigation

Environmental Approvals and Permitting Risks

15 Environmental process impact on design

- Design changes may be required as a result of environmental concessions
- **Work to understand issues and accommodate realistic solutions early in design process to minimize downstream effects on procurement and construction**

$20 to $50
$20 to $50
$0

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16 Unanticipated design changes impact environmental process

- Due to changes, the design may no longer be consistent with concepts previously submitted for regulatory approval
- **Screen for issues early and try to work acceptable solutions that avoid schedule impact**
- **Include EA Manager in approval process for design changes**

$0 to $60
$0 to $18
$0

Stakeholder Risks

17 Schedule impact due to delay in ratification of IBA by Labrador Innu Nation

- Ratification delay due to non-alignment within the Innu community
- **Maintain close ties with aboriginal leaders and be responsive to the needs of various aboriginal groups**

$0 to $24
$0
$0 to $20

Strategic Risks Considered in Analysis

Key Risks / Potential Benefits

Bold Comments are Mitigations

Impact (Millions)
Unmitigated
Mitigated
Cost of Mitigation

Stakeholder Risks

18 **Lack of support from other aboriginal groups**	– Other aboriginal groups may claim a lack of consultation during the project EA process which may result in the EA process being stayed – **Aggressively engage and consult all potentially impacted aboriginal groups**	$5 to $35 $3 to $18 $2
19 **Non-governmental organization / stakeholder protest**	– Protest could come at critical stage of construction or during the EA process – **Implement a stakeholder communication plan** – **Focus on getting Nalcor's message out on the benefits of the project**	$0 to $25 $0 to $10 $0

Gull Island Construction Risks

20 **Availability of experienced hydro contractors**	– Industry consolidation and lack of hydro activity for 20 years has limited available and viable contractors – Contractor market improving due to weakening demand – **Engage worldwide market and "sell the project" to stimulate interest** – **Use innovative contracting strategy to make project attractive to contractors with risk / benefit balance**	$0 to $100 $0 to $10 $0

Strategic Risks Considered in Analysis

Key Risks / Potential Benefits

Bold Comments are Mitigations

Impact (Millions)
Unmitigated
Mitigated
Cost of Mitigation

Gull Island Construction Risks

21 **Ability to use Newfoundland & Labrador contractors due to lack of creditworthiness**	– Conditions of project finance will demand contractors be creditworthy for value of scope – **Proactive program to educate contractors on issue** – **Work with contractors to find suitable partners or underwriters** – **Consider this risk in the contract package definition**	**$10 to $50** **$0 to $25** $0
22 **Availability of qualified construction management / supervision**	– Worldwide construction at historic high with peak early next decade; however, due to recession, there is a forecasted slowdown for the short to medium term – **Establish benefit/reward relationships with contractors** – **Actively recruit Newfoundlanders home**	**-$180 to $90** **-$180 to $0** $0 to $15
23 **Site conditions worse than geotechnical baseline**	– Contractors will not take unknown geotechnical risks without prohibitive risk premiums – **Maximize geotechnical investigations to determine conditions as well as possible before bidding**	**$0 to $75** **$0 to $75** $0

Strategic Risks Considered in Analysis

Key Risks / Potential Benefits

Bold Comments are Mitigations

Impact (Millions)
Unmitigated
Mitigated
Cost of Mitigation

Gull Island Construction Risks

24 **Availability and retention of skilled construction labour**	– Current worldwide peak construction over Q2 2011	-$40 to $100
	– **Actively recruit Newfoundlanders home**	-$40 to $100
	– **Recruit supervision that works well with Newfoundlanders**	$0
	– **Negotiate a labor agreement that supports trade flexibility**	
25 **Availability of unskilled construction labour**	– Remote jobsite and less desirable work	$0
	– **Promote opportunity for training and advancement**	$0
	– **Leverage underutilized labour pools**	$0
	– **Provide competitive opportunities for locals**	

Hydro Turbine Supplier Risks

26 **Limited number of creditworthy hydro turbine suppliers**	– "Seller's market" worldwide - order books full for 2010	$0 to $50
	– North America declining in importance as market	$0 to $50
	– **Actively engage the two existing "bankable" suppliers**	$0
	– **Explore contracting model and risk allocation strategy**	
	– **Decide early on strategy and selection of supplier**	

Strategic Risks Considered in Analysis

Key Risks / Potential Benefits

Bold Comments are Mitigations

Impact (Millions)
Unmitigated
Mitigated
Cost of Mitigation

De-escalation / Inflation Risks

27	**De-escalation / hyper-inflation risks**	– Driven by global demand with future difficult to predict – Need to consider hyperinflation due to significant barriers to entry in the specialty supply marketplace – **Monitor market and understand supply / demand balances for goods and materials**	**$0** **$0** $0

Transmission Risks

28	**Availability of experienced high-voltage contractors and skilled labour**	– Limited number of qualified transmission contractors – Resource requirements very large compared to supply – **Actively pursue potential suppliers worldwide** – **Phase the transmission build in order to flatten resource demands** – **Actively support training of linespersons**	**$0 to $240** **$50 to $100** $2 to $20
29	**Limited number of HVdc specialties suppliers and installers**	– Basically two suppliers and installers of subsea cable – Location (especially Strait of Belle Isle) challenging – Tight weather window for installation – **Optimize packaging strategy of HVdc specialties equipment and services to entice key players** – **Select and engage early to ensure availability**	**$0 to $50** **$0 to $25** $2 to $10

Strategic Risks Considered in Analysis

Key Risks / Potential Benefits

Bold Comments are Mitigations

Impact (Millions)
Unmitigated
Mitigated
Cost of Mitigation

Transmission Risks

30 Island Link and Maritime Link EA's result in late design changes

- Sea-return electrodes faced challenges in other jurisdictions
- Significant public concerns raised regarding access routes
- Habitat destruction in the SOBI due to submarine cable
- **Work to understand environmental issues and promote realistic solutions early in the design process**
- **Complete early concept desktop studies on potential design changes that the EA could recommend**

$25 to $250
$25 to $100
$0 to $5

Shareholder Risks

31 Unwillingness of Shareholder to fund early construction on equity defers construction

- Current engineering and construction schedule assumes $2-3 B of equity injection prior to financial close in 2013
- Major go/no-go decision regarding equity spend is in late 2011 – concurrent with the next provincial election when there could be an unwillingness to commit to spending
- **Ensure early and ongoing alignment with the Shareholder on all aspects of the project**
- **Seek early commitment and release of capital for 2010 activities**

$0 to $96
$0 to $48
$0

Strategic Risks Considered in Analysis

Key Risks / Potential Benefits

Bold Comments are Mitigations

Impact (Millions)
Unmitigated
Mitigated
Cost of Mitigation

Environmental Assessment Risks

32 Delay in the release of the Island Link from EA

- Federal government decisions on type and level of federal EA required have not yet been made
- Uncertainty re: type and location of electrodes
- Uncertainty re: conduit or subsea option for SOBI
- **Make a strategic decision to go with a Comprehensive Review rather than a Screening Study to avoid recycle and schedule slippage**
- **Increase stakeholder consultation activities**

$0
$0
$0

Enterprise Risks

33 Uncertainty on commercial structure for transmission

- Ownership philosophy for the Maritime Link and Island Link not yet determined; Emera and NB Power are potential equity partners
- Uncertainty also exists as to whether this will be a merchant or regulated asset
- **Identify and evaluate all plausible options and develop recommendation based on alignment with Nalcor's and the Province's strategic objectives**
- **Aggressively engage Emera and NB Power**

$24 to $48
$0 to $24
$0

Supplemental Information

Predictive Range

Predictive Range: The term predictive range is used throughout this report when describing the results of Monte Carlo simulations for both Time-Risk and Strategic-Risk assessments. Specifically, the predictive range refers to the P25 to P75 band of results for a given assessment. Because the predictive range is comprised of the middle 50% of the results, it is usually thought to be the most relevant indicator of future outcomes when assessing a modeled situation.

Weather Windows for Time-Risk Activities

The following weather windows are used in the Time-Risk analysis:

1) Task 27: Early Infrastructure Works – Bridge and Access
May 1 – November 15

2) Task 32: Cofferdam Closure
July 1 – October 31

3) Task 50: SOBI Cable Installation
June 15 – October 15

4) Task 51: SOBI Cable Protection
May 1 – October 31

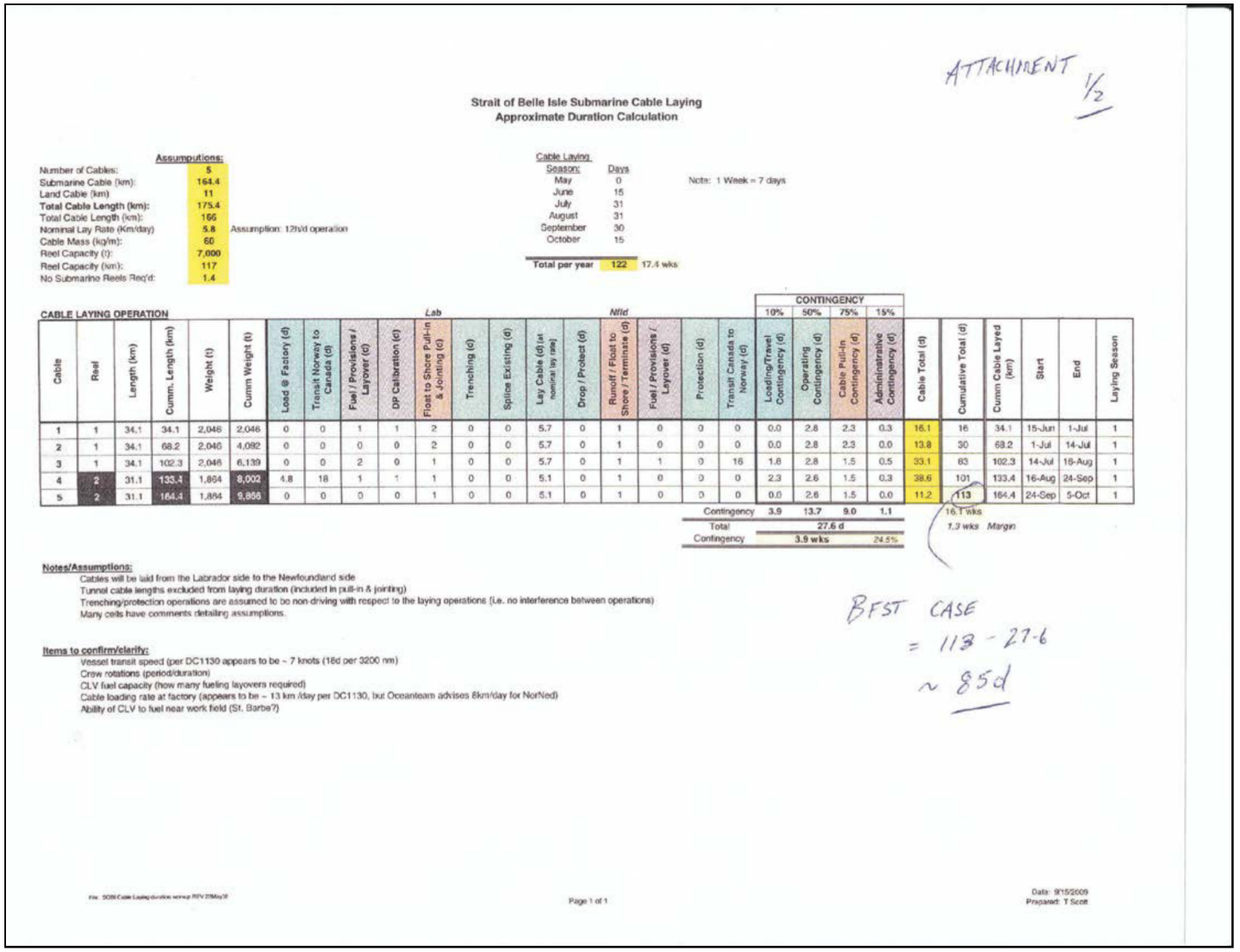
5) Task 60: Cabot Strait Cable Installation
May 1 – October 15

Reservoir Impoundment

Reservoir Impoundment Rates		
Month	**Average Flow (cubic m/sec.)**	**Number of Days to Fill**
Jan	1,820	40
Feb	1,818	41
Mar	1,697	45
Apr	1,498	54
May	2,368	28
Jun	2,056	34
Jul	1,607	48
Aug	1,487	54
Sep	1,422	58
Oct	1,592	49
Nov	1,708	44
Dec	1,768	42

Strait of Belle Isle Submarine Cable Laying Duration

CIMFP Exhibit P-00904



ATTACHMENT 1/2

Strait of Belle Isle Submarine Cable Laying
Approximate Duration Calculation

Assumptions:

Number of Cables:	5
Submarine Cable (km):	164.4
Land Cable (km)	11
Total Cable Length (km):	175.4
Total Cable Length (km):	166
Nominal Lay Rate (Km/day)	5.8
Cable Mass (kg/m):	60
Reel Capacity (t):	7,000
Reel Capacity (km):	117
No Submarine Reels Req'd:	1.4

Assumption: 12h/d operation

Cable Laying Season:	Days
May	0
June	15
July	31
August	31
September	30
October	15
Total per year	**122** 17.4 wks

Note: 1 Week = 7 days

CABLE LAYING OPERATION

Cable	Reel	Length (km)	Cumm. Length (km)	Weight (t)	Cumm Weight (t)	Load @ Factory (d)	Transit Norway to Canada (d)	Fuel / Provisions / Layover (d)	DP Calibration (d)	Float to Shore Pull-in & Jointing (d)	Trenching (d)	Splice Existing (d)	Lay Cable (d) (at nominal lay rate)	Drop / Protect (d)	Runoff / Float to Shore / Terminate (d)	Fuel / Provisions / Layover (d)	Protection (d)	Transit Canada to Norway (d)	CONTINGENCY 10% Loading/Travel Contingency (d)	CONTINGENCY 50% Operating Contingency (d)	CONTINGENCY 75% Cable Pull-in Contingency (d)	CONTINGENCY 15% Administrative Contingency (d)	Cable Total (d)	Cumulative Total (d)	Cumm Cable Layed (km)	Start	End	Laying Season
						Lab									*Nfld*												
1	1	34.1	34.1	2,046	2,046	0	0	1	1	2	0	0	5.7	0	1	0	0	0	0.0	2.8	2.3	0.3	16.1	16	34.1	15-Jun	1-Jul	1
2	1	34.1	68.2	2,046	4,092	0	0	0	0	2	0	0	5.7	0	1	0	0	0	0.0	2.8	2.3	0.0	13.8	30	68.2	1-Jul	14-Jul	1
3	1	34.1	102.3	2,046	6,139	0	0	2	0	1	0	0	5.7	0	1	1	0	16	1.6	2.8	1.5	0.5	33.1	63	102.3	14-Jul	16-Aug	1
4	2	31.1	133.4	1,864	8,002	4.8	18	1	1	1	0	0	5.1	0	1	0	0	0	2.3	2.6	1.5	0.3	38.6	101	133.4	16-Aug	24-Sep	1
5	2	31.1	164.4	1,864	9,866	0	0	0	0	1	0	0	5.1	0	1	0	0	0	0.0	2.6	1.5	0.0	11.2	113	164.4	24-Sep	5-Oct	1
																		Contingency	3.9	13.7	9.0	1.1	16.1 wks				
																		Total	27.6 d				1.3 wks Margin				
																		Contingency	3.9 wks			24.5%					

Notes/Assumptions:

Cables will be laid from the Labrador side to the Newfoundland side
Tunnel cable lengths excluded from laying duration (included in pull-in & jointing)
Trenching/protection operations are assumed to be non-driving with respect to the laying operations (i.e. no interference between operations)
Many cells have comments detailing assumptions.

Items to confirm/clarify:

Vessel transit speed (per DC1130 appears to be ~ 7 knots (18d per 3200 nm)
Crew rotations (period/duration)
CLV fuel capacity (how many fueling layovers required)
Cable loading rate at factory (appears to be ~ 13 km /day per DC1130, but Oceanteam advises 8km/day for NorNed)
Ability of CLV to fuel near work field (St. Barbe?)

BEST CASE
= 113 - 27.6
~ 85d

Page 1 of 1

Date: 9/15/2009
Prepared: T Scott

Cabot Strait Submarine Cable Laying Duration

CIMFP Exhibit P-00904

ATTACHMENT 2
2/2

Cabot Strait Submarine Cable Laying
Approximate Duration Calculation

Assumptions:

Number of Cables:	2
Submarine Cable (km):	365
Land Cable (km)	6.4
Total Cable Length (km):	372
Nominal Lay Rate (Km/day)	5.8
Cable Mass (kg/m):	44
Reel Capacity (t):	7,000
Reel Capacity (km):	159
No Submarine Reels Req'd:	2.3

Assumption: 12h/d operation

Cable Laying Season:

	Days
May	31
June	30
July	31
August	31
September	30
October	15
Total per year	168 (24.0 wks)

Note: 1 Week = 7 days

CABLE LAYING OPERATION

Cable	Reel	Length (km)	Cumm. Length (km)	Weight (t)	Cumm Weight (t)	Load @ Factory (d)	Transit Norway to Canada (d)	Fuel / Provisions / Layover (d)	DP Calibration (d)	Float to Shore Pull-In & Jointing (d)	Trenching (d)	Splice Existing (d)	Lay Cable (d) [at nominal lay rate]	Drop / Protect (d)	Runoff / Float to Shore / Terminate (d)	Fuel / Provisions / Layover (d)	Protection (d)	Transit Canada to Norway (d)	CONTINGENCY 10% Loading/Travel Contingency (d)	CONTINGENCY 50% Operating Contingency (d)	CONTINGENCY 75% Cable Pull-In Contingency (d)	CONTINGENCY 15% Administrative Contingency (d)	Cable Total (d)	Cumulative Total (d)	Cumm Cable Layed (km)	Start	End	Laying Season
								Nfld								N.S.												
1	1	158.9	158.9	6,993	6,993	0	0	1	1	2	0	0	27.0	1	0	1	0	18	1.8	14.0	1.5	0.5	68.8	69	158.9	1-May	8-Jul	1
1	2	26.1	185.0	1,149	8,141	11.9	20	1	1	0	0	2	4.0	0	1	0	0	0	3.2	3.0	0.8	0.3	48.1	117	185.0	8-Jul	25-Aug	1
2	2	128.5	313.5	5,653	13,794	0	0	1	0	2	0	0	21.7	2	0	1	0	0	0.0	11.9	1.5	0.3	41.4	158	313.5	25-Aug	6-Oct	1
2	3	62.2	375.7	2,735	16,530	4.8	18	1	1	0	0	2	10.2	0	1	0	0	0	2.3	6.1	0.8	0.3	47.5	206	375.7	1-May	17-Jun	2
			375.7	0	16,530	0	0	0	0	0	0	0	0.0	0	0	0	0	0	0.0	0.0	0.0	0.0	0.0	206	375.7	17-Jun	17-Jun	2
																		Contingency	7.3	35.0	4.5	1.4	29.4 wks				
																		Total		48.1 d			-5.4 wks Margin					
																		Contingency		6.9 wks		23.4%						

Notes/Assumptions:

Cables will run from MacDougall's Gulch, NL to Lingan, NS
Cables will be laid from theNewfoundland side to the Nova Scotia side
Trenching/protection operations are assumed to be non-driving with respect to the laying operations (i.e. no interference between operations)
Many cells have comments detailing assumptions.
Draft DC1140 report indicates potential to work later in the year, but May - Oct. is considered optimal

Season 1 158 d
Season 2 47 d
206 d

Items to confirm/clarify:

Vessel transit speed (per DC1130 appears to be ~ 7 knots (18d per 3200 nm)
Crew rotations (period/duration)
CLV fuel capacity (how many fueling layovers required)
Cable loading rate at factory (appears to be ~ 13 km /day per DC1130)
Requirement of CLV to refuel during laying operation

BEST CASE
206 - 48
= 158 d

File: Cabot Strait Cable Laying Spreadsheet - 15Jun09

Page 1 of 1

Date: 9/15/2009
Prepared: T Scott