

1 Q. Further to the response to MHI-Nalcor-2, please provide the individual CPW results
2 for each of the Interconnected Scenario and the Isolated Island Scenario.

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5 A. The CPW value for Interconnected Island truncated in 2041 is \$5,601 million
6 (\$2010) while the CPW value for the Isolated Island truncated in 2041 is \$6,659
7 million (\$2010). The CPW preference for Interconnected Island is the difference of
8 these two CPW values, or \$1,058 million (\$2010) as reported in MHI-Nalcor-2.

1 Q. The response to MHI-Nalcor-3 states that the option of accessing Churchill Falls
2 power in 2041 was screened out as a viable option due to a number of issues
3 including security of supply and reliability. It is stated on p. 1 in lines 19-22 that it is
4 difficult to determine the environmental and policy frameworks that will be in place
5 in 2041 and that there are other issues surrounding the Churchill Falls asset with
6 respect to Hydro Quebec. The response to MHI-Nalcor-99 confirms that in the
7 analysis for the power purchased expense for the Infeed Option, energy was
8 assumed to be sourced from Churchill Falls for the period 2057 to 2067 while the
9 response to MHI-Nalcor-49.2 provides that the price for such energy during that
10 period is the price paid by Hydro Quebec under the Power Contract with CF(L)Co. In
11 the response to MHI-Nalcor-3, p. 2 lines 18-19 it is stated that the risks and
12 uncertainties associated with the option of accessing Churchill Falls power in 2041
13 are not present in the Interconnected scenario.

14

15 These responses appear to provide conflicting information. Explain how the issues
16 of security and reliability referred to in the response to MHI-Nalcor-3 do not apply
17 to accessing Churchill Falls power in the period 2057 to 2067 and how the
18 statement on lines 18-19 on p. 2 of the MHI-Nalcor-3 is correct.

19

20

21 A. The energy that Nalcor assumed to be available from Churchill Falls starting in 2057
22 and continuing through 2067 represents incremental requirements for the Island in
23 this period. It is not a material consideration in terms of quantity or cost and Nalcor
24 made this simplifying supply assumption with that knowledge. The average annual
25 energy required for the distant period is 278 GWh per year. The present value of
26 the total energy required from 2057 to 2067 is about 50 GWh.

27

1 By contrast, assuming that there is unencumbered supply available from Churchill
2 Falls for the Island commencing in 2042 is material. The average annual energy
3 required for 2042 to 2067 is 4,471 GWh per year. The present value of the total
4 energy required from 2042 to 2067 is about 4,500 GWh.

5

6 This assumption will be revisited during DG3 analysis.

1 Q. The response to MHI-Nalcor-3 states that the option of accessing Churchill Falls
2 power in 2041 was screened out as a viable option due to a number of issues
3 including security of supply and reliability. It is stated on p. 1 in lines 19-22 that it is
4 difficult to determine the environmental and policy frameworks that will be in place
5 in 2041 and that there are other issues surrounding the Churchill Falls asset with
6 respect to Hydro Quebec. The response to MHI-Nalcor-99 confirms that in the
7 analysis for the power purchased expense for the Infeed Option, energy was
8 assumed to be sourced from Churchill Falls for the period 2057 to 2067 while the
9 response to MHI-Nalcor-49.2 provides that the price for such energy during that
10 period is the price paid by Hydro Quebec under the Power Contract with CF(L)Co. In
11 the response to MHI-Nalcor-3, p. 2 lines 18-19 it is stated that the risks and
12 uncertainties associated with the option of accessing Churchill Falls power in 2041
13 are not present in the Interconnected scenario.

14

15 These responses appear to provide conflicting information. Explain how the issues
16 of security and reliability referred to in the response to MHI-Nalcor-3 do not apply
17 to accessing Churchill Falls power in the period 2057 to 2067 and how the
18 statement on lines 18-19 on p. 2 of the MHI-Nalcor-3 is correct.

19

20

21 A. The energy that Nalcor assumed to be available from Churchill Falls starting in 2057
22 and continuing through 2067 represents incremental requirements for the Island in
23 this period. In Nalcor's view, this is not a material consideration in terms of quantity
24 or cost and Nalcor made this simplifying supply assumption with that knowledge.
25 The average annual energy required for the distant period is 278 GWh per year. The
26 CPW for this energy valued at \$2 /MWh is \$0.1 million (\$2010) and \$12.2 million
27 (\$2010) if valued at New York market prices.

1 By contrast, Nalcor views the assumption of an unencumbered supply being made
2 available from Churchill Falls for the Island commencing in 2042 as material. The
3 average annual energy required for 2042 to 2067 is 4,741 GWh per year. The CPW
4 for this energy valued at \$2 /MWh is \$9.0 million (\$2010) and \$878.3 million
5 (\$2010) if valued at New York market prices.

6

7 This assumption will be revisited during DG3 analysis.

- 1 Q. Explain why accessing Churchill Falls power for the period 2057-2067, as evidenced
2 in the responses to MHI-Nalcor-49.2 and MHI-Nalcor-99, is a valid assumption for
3 the Infeed scenario but it is not appropriate to use Churchill Falls power from 2041
4 as stated in the response to MHI-Nalcor-3 due to security and reliability issues as a
5 viable option for the supply of power for the Isolated Island scenario.
6
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8 A. Please see the response to PUB-Nalcor-92.

1 Q. The response to MHI-Nalcor-9 states that in the Isolated Island Option no analysis
2 has been done related to the operation of the Holyrood Thermal Plant and the
3 response to MHI-Nalcor-3 states that there are risks associated with life extension
4 measures for the Plant. If no analysis has been completed on the life extension
5 measures and costs associated with the Plant what is the support for the statement
6 that there are risks associated with life extension?

7

8

9 A. Nalcor's Isolated Island expansion plan contemplates replacement of Holyrood's
10 two oldest units with combined cycle combustion turbines in the 2033 timeframe
11 and replacement of unit 3 in 2036.

12

13 The scenario presented in MHI-Nalcor-3 contemplates the Holyrood facility
14 continuing operation to 2041. While the facility could be rebuilt to achieve this
15 extended service life, Nalcor's Island Interconnected plan for Holyrood only sees a
16 small portion of the plant continuing in service – the generators and electrical
17 systems supporting synchronous condenser operation. No analysis to support the
18 continued use of Holyrood's fuel handling, boilers, turbines, and auxiliary systems
19 to 2041 has been completed and this assumption therefore carries a level of risk
20 with it.

21

22 In considering emissions, the Government of Canada has also published its
23 proposed greenhouse gas (GHG) regulations for coal fired generating facilities, and
24 has proposed a 45 year design life for coal fired facilities. These have been filed as
25 Exhibit 107.

26

1 Since the GHG intensity of heavy fuel oil is 77% that of coal and 2.2 times that of
2 natural gas, Nalcor expects the Government of Canada to impose limitations on
3 heavy fuel oil fired generating facilities that are similar to those proposed for coal
4 fired generation.

5

6 Under the proposed regulations, existing facilities (commissioned prior to July 1,
7 2015) that have reached the end of their 45 year design life may receive an
8 exemption to continue operation until 2025, provided they incorporate carbon
9 capture and storage (CCS) technology to reduce their emissions intensity to that of
10 a natural gas fired generating facility. New facilities (commissioned on or after July
11 1, 2015) that incorporate CCS technology can apply for a deferral of application of
12 the standard to 2025.

13

14 Nalcor has not completed any studies to consider the implementation of CCS at
15 Holyrood, but notes that SaskPower has initiated a \$1.2 billion project to refurbish
16 and implement CCS on Unit 3 of SaskPower's Boundary Dam thermal facility. After
17 the project is completed, the unit will have an output of 110 MW. Further
18 information on this project is provided in Exhibit 110.

19

20 Based on these considerations Nalcor believes there is a risk that Holyrood will not
21 be permitted to operate in its current manner for the next 30 years until 2041.

1 Q. In the responses to MHI-Nalcor-3, p.3, it is stated that the option of accessing
2 Churchill Falls power in 2041 introduces other economic disadvantages as value is
3 lost through the deferral of monetization of the Province’s energy warehouse and
4 the economic and employment benefits from energy construction projects are
5 foregone for decades. Is it correct that this assumes that there will be no other
6 Lower Churchill developments for sales of power and energy outside the Province
7 prior to 2041?

8
9

10 A. Nalcor’s statement in MHI-Nalcor-3 was not predicated on whether other lower
11 Churchill developments take place prior to 2041. Nalcor’s project plans foresee a
12 construction start of Muskrat Falls in 2012, so a deferral of Muskrat Falls
13 construction to some later date after 2012 represents a loss of value and benefits to
14 the Province.

15

16 With a deferral of construction of the Labrador Island Transmission Link until the
17 years immediately preceding 2041, economic and employment benefits associated
18 with the link are deferred for decades – from 2012 to a year close to 2041.

1 Q. When was Navigant engaged by Nalcor to complete this review?

2

3

4 A. Navigant submitted a proposal to Nalcor on May 20, 2011 to undertake the
5 Independent Supply Decision Review. The contract between Nalcor and Navigant
6 was executed June 30, 2011.

1 Q. Please identify the key personnel by focus area who conducted the review by
2 Navigant and provide their CVs.

3

4

5 A. The key personnel assigned to the project and their focus areas are presented
6 below:

7

8 Todd Williams – Project Manager

9 Dawei Zhou – Transmission

10 Jim Peterson – Engineering and Costing

11 Frank Stern – Demand, Renewables and Strategist

12 Ralph Zarumba – Revenue Requirements and Rate Impact

13

14 The CVs are filed as Exhibit-104.

1 Q. Please provide the total person hours spent by the key Navigant personnel in
2 completing its review and provide a breakdown of the hours spent by each key
3 person.

4

5

6 A. Please see the table below showing the person hours spent by key Navigant
7 personnel in completing its review:

8

Team Member	Position	Hours
Todd Williams	Managing Director	141
Jim Peterson	Director	168
Frank Stern	Director	111
Ralph Zarumba	Director	52
Dawei Zhou	Associate Director	61
Total		533

9

10 Please refer to PUB-Nalcor-97 for further information on team members.

1 Q. Describe the process followed by Navigant in completing Exhibit 101 and include in
2 the reply the total hours spent by Navigant in each of: (i) reviewing Nalcor produced
3 documentation; (ii) meetings or interviews with Nalcor personnel and (iii)
4 completing its own analysis

5
6

7 A. Navigant's review process included each of the three activities listed in the
8 question, generally starting with a review of Nalcor produced documentation and
9 then a combination of completing its own analysis and meetings or interviews with
10 Nalcor personnel.

11

12 Navigant did not track its time according to these three activities so the requested
13 breakdown is not available.

14

15 Navigant has estimated that approximately 25% of time was spent reviewing Nalcor
16 produced documentation; 20% of time was spent in meetings or interviews with
17 Nalcor personnel and 55% of time was spent completing its own analysis.

1 Q. Did Navigant perform any other work or analysis for Nalcor or any of its subsidiaries
2 or associated companies prior to its engagement for the Independent Supply
3 Decision Review? If yes, provide details.

4

5

6 A. The listing of various assignments undertaken for Nalcor and its subsidiaries or
7 associated companies by Navigant and its predecessor company, Reed Consulting,
8 since the late 1990s is provided below.

9

10 As can be observed in the table below, Navigant has completed a number of
11 assignments for Nalcor on a variety of electricity market related matters.

12

13

Date	Description: Navigant Assignments (Toronto Office)
September 2011	Independent supply decision review (DG2) prepared for Nalcor Energy
May 2011	Lower Churchill Ontario Market Update and Strategy Advice Report
September 2010	Support for Joint Review Panel Hearings and Preparations
May - June 2010	Advice and assessment of market potential in Eastern Canada & North Eastern US
December 2008 – present	Provide ongoing advice related to the ON electricity market in support of negotiations with OPA
March 2008 – September 2008	Estimate of Ontario’s avoided capital and operating expenses during the 2015-2035 time frame under various LCP import scenarios
November 2007 – October 2008	Advice on pricing elements and principles for long-term PPAs with OPA, NSPI and NB Power
February 2008	Eastern Market Assessment Report
May - August 2007	Eastern Canadian market report and update
October 2006	Ontario Capacity Prices
August 2006	2006 Ontario Wholesale Power Market Assessment (Multi-Client Study)
July 2006	US Northeast Market Plan for Lower Churchill Project
June 2006	Review of ON Supply Mix Directive

Date	Description: Navigant Assignments (Toronto Office)
April 2006	Review of New England Ph1/11 HVDC facilities and identification of parties holding transmission rights
March 2006	Ontario Market Developments Report – March 2006 update
2006	Review of IESO Reliability report
March 2006	Review of OPA Supply Mix Report
February 2006	Eastern Canadian Market Assessment Report
November 2005	Quebec Transmission issues
June 2004	Overview of Ontario, Quebec and Maritime Electricity markets
December 2002	Gull Island Contract Analysis
October 2002	Ontario summer 2002 wholesale market assessment and market price forecast
January 2002	Summary of Northeast Transmission Projects
December 2001	Presentation for LCP on export market assessment
December 2001	Ontario wholesale market assessment
December 2001	Overview of New England Power Market
February – March 2000	Reference Pricing Issues : Review of Reference Pricing , Hedging and Market Influence Issues
October 1999	Labrador Hydro Project export market price forecast update

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Date	Description: Reed Consulting Assignments (Boston Office)
May 1999	Average pricing forecast
October 1998 - January 1999	Assessment of market pricing mechanisms for LCP
May 1998	Churchill River Project export market study