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BY COURIER

March 12, 2008

Mr. David MacIntosh
Case Manager
Energy Probe Research Foundation
225 Brunswick Ave
Toronto ON M5S 2M6

Dear Mr. MacIntosh:

EB-2007-0050 – Hydro One Networks' Section 92 Bruce - Milton Transmission Reinforcement Application – Hydro One Networks' Response to Interrogatory Questions from Energy Probe List 1

I am attaching an electronic copy and a paper copy of the responses to the interrogatory questions of Energy Probe list 1.

Intervenors and the OEB are being provided electronic copies. CDs are available on request.

Sincerely,

ORIGINAL SIGNED BY ANDREW SKALSKI FOR SUSAN FRANK

Susan Frank

c. Kirsten Walli, Ontario Energy Board
EB-2007-0050 Intervenors (by email)
M. Heinz, Ontario Power Authority (by email)

Energy Probe INTERROGATORY #1 List 1

Interrogatory

Issue Number: 1.1
Issue: Has the need for the proposed project been established?

Ref B/Tab 6/Sch 5/Appendix 5

Please provide a breakdown of load carrying capacity of each 500 kV circuit and each 230 kV circuit referenced on page 43 of Appendix 5 along with the actual loading of each circuit on the winter and summer peak day for the past 10 years.

Response

The load carrying capacity of each of the identified 230 kV and 500 kV circuits is set out in the Bruce to Milton System Impact Assessment Report [Exh. B, T/6. S/2, Table 1, Pg. 6, and Diagram 4].

As noted in Hydro One's earlier correspondence dated February 26, 2008 to the Board and parties, data prior to market opening is not available. The IESO is only able to provide data for the actual winter and summer peak day loading of each of the identified circuits for the last five years. The information is as follows:

Period	Date	B22D Amps	B23D Amps	B27S Amps	B28S Amps	B4V Amps	B5V Amps	B560V Amps	B561M Amps	B562L Amps	B563L Amps
Winter	01/22/2003	460.3	466.8	372.8	183.9	564.5	573.0	886.4	978.3	144.0	225.8
Summer	06/25/2003	440.9	446.9	269.9	133.7	444.7	456.5	565.2	618.6	168.3	315.0
Winter	01/26/2004	434.2	437.6	378.5	187.2	546.3	548.9	829.7	901.3	128.1	289.3
Summer	07/22/2004	557.6	564.9	412.4	33.2	587.7	590.2	1021.5	1182.2	709.0	769.5
Winter	01/18/2005	520.2	526.2	406.6	185.5	641.5	643.8	1041.7	1147.1	372.9	367.7
Summer	06/27/2005	504.4	515.5	308.9	141.6	543.4	544.9	968.0	1092.3	491.9	463.1
Winter	01/16/2006	531.3	539.0	390.4	171.7	662.3	667.6	1243.4	1379.4	491.2	486.2
Summer	08/01/2006	564.1	570.5	349.7	158.0	589.2	616.1	1056.2	1204.7	578.2	587.3
Winter	02/05/2007	476.6	468.2	361.8	173.6	543.6	567.8	1065.9	1179.8	311.0	375.4
Summer	06/26/2007	572.1	564.5	345.5	147.7	659.0	653.1	1121.7	1280.8	601.2	655.5

Energy Probe INTERROGATORY #2 List 1

Interrogatory

Issue Number: 1.1
Issue: Has the need for the proposed project been established?

Ref B/Tab 6/Sch 5/Appendix 5

Please provide historical peak loadings on each 500 kV circuit and each 230 kV circuit referenced on page 43 of Appendix 5 for the summer and winter peak day for the years in which all units at both Bruce A and Bruce B were concurrently available for service.

Response

As noted in Hydro One's earlier correspondence dated February 26, 2008 to the Board and parties, data prior to market opening is not available. Since market opening, the historical summer and winter peak loadings on each of the identified 230 kV and 500 kV circuits for the years in which all Bruce A and Bruce B operating units were concurrently available for service are as follows:

1

Period	Date	B22D Amps	B23D Amps	B27S Amps	B28S Amps	B4V Amps	B5V Amps	B560V Amps	B561M Amps	B562L Amps	B563L Amps
Winter	01/18/2005	520.2	526.2	406.6	185.5	641.5	643.8	1041.7	1147.1	372.9	367.7
Winter	01/16/2006	531.3	539.0	390.4	171.7	662.3	667.6	1243.4	1379.4	491.2	486.2
Summer	08/01/2006	564.1	570.5	349.7	158.0	589.2	616.1	1056.2	1204.7	578.2	587.3
Winter	02/05/2007	476.6	468.2	361.8	173.6	543.6	567.8	1065.9	1179.8	311.0	375.4

Energy Probe INTERROGATORY #3 List 1

Interrogatory

Issue Number: 1.1
Issue: Has the need for the proposed project been established?

Ref B/Tab 6/Sch 5/Appendix 5

Please provide historical capacity factors during the summer and winter peak periods for all generating units at Bruce A and Bruce B from their respective inservice dates to the present.

Response

As noted in Hydro One's earlier correspondence dated February 26, 2008 to the Board and parties, generation production data prior to market opening is not available. The historical capacity factors for Bruce A and Bruce B generating units from market opening to the present are as follows:

		Bruce Generation Units Seasonal Capacity Factors (%)					
Period	**Season**	**Bruce A Unit 3**	**Bruce A Unit 4**	**Bruce B Unit 5**	**Bruce B Unit 6**	**Bruce B Unit 7**	**Bruce B Unit 8**
2002	Summer			100	25	92	98
2002/2003	Winter			100	100	87	100
2003	Summer			91	88	97	98
2003/2004	Winter	22	85	92	99	100	57
2004	Summer	91	79	96	86	96	89
2004/2005	Winter	28	88	98	84	93	100
2005	Summer	84	96	98	96	38	99
2005/2006	Winter	58	98	93	83	94	88
2006	Summer	83	88	93	95	98	85
2006/2007	Winter	96	92	94	32	98	94
2007	Summer	91	77	91	86	98	93
2007/2008	Winter	89	88	88	92	53	85

Energy Probe INTERROGATORY #4 List 1

Interrogatory

Issue Number: 1.1
Issue: Has the need for the proposed project been established?

Ref B/Tab 6/Sch 5/Appendix 5

Pages 44 - 45 of Appendix 5 project ultimate wind generation capacity in the Bruce area at
1725 MW.

a) Does this number incorporate capacity reduction factors to account for seasonal and geographical variability of wind generation among the identified wind clusters?

b) If not, has HONI, OPA or IESO conducted any studies to determine what the appropriate capacity reduction factors should be? If so, please provide the studies. If not, please explain why this information is not relevant to a determination of the transmission capacity required for the Bruce area.

Response

a) The numbers cited from pages 44-45 of Exhibit B, Tab 6, Schedule 5, Appendix 5 are installed capacities of the wind facilities. They do not take into account the seasonal or geographic variability of wind generation.

b) The OPA has conducted studies to assess what the appropriate capacity factors should be. Please refer to the response to Board Staff Interrogatory 1.6 (ii). Studies examining seasonal and geographic variability of wind generation have been publicly filed as part of the OEB IPSP proceeding (EB-2007-0707). Please refer to Exhibit D Tab 5 Schedule 1 Attachment 1 and 3.

Energy Probe INTERROGATORY #5 List 1

Interrogatory

Issue Number: 1.1
Issue: Has the need for the proposed project been established?

Ref B/Tab 6/Sch 5/Appendix 5

Page 44 of Appendix B concludes that the current nuclear generating capacity at the Bruce site is 5060 MW based on four 890 MW units at Bruce B and two 750 MW units at Bruce A.

Please provide details on how the unit capacities have been arrived at including details of any CNSC operating restrictions that might apply.

Response

The total capacity of the generation at the Bruce nuclear site has been updated to reflect changes in the Bruce B unit capacities. Please refer to: Exhibit B, Tab 6 Schedule 5 Appendix 1, updated March 10th and included in the response to OEB staff Interrogatory 1.1. Individual unit capacity changes were also presented at the Technical Conference (see Day 1 Technical Conference Presentation Exhibit KT.1 slides 14 and 15 transcript pages 15 to 17). These capacities are net maximum continuous ratings.

The 750 MW rating for the Bruce A units used by OPA for planning purposes is consistent with levels stated in the Bruce Power Refurbishment Implementation Agreement. The previous 890 MW rating for the Bruce B units was based on Bruce Power's application to the IESO for a System Impact Assessment ("SIA"). Subsequent to the SIA application, the OPA has confirmed with Bruce Power that the 850 MW rating is to be assumed.

Hydro One, the OPA and the IESO do not have information related to any CNSC operating restrictions that might apply.

Energy Probe INTERROGATORY #6 List 1

Interrogatory

Issue Number: 1.4
Issue: Is the project suitably chosen and sufficiently scalable so as to meet all reasonably foreseeable future needs of significantly increased or significantly reduced generation in the Bruce area?

Ref B/Tab 6/Sch 5

Page 4 of the referenced section estimates that total combined nuclear and wind generation capacity in the Bruce area could reach 8300 MW by the middle of the next decade.

a) Please provide details of when Bruce B units will reach the currently projected end of useful life.

b) How has retirement of Bruce B capacity been considered in the need for additional 500 kV transmission facilities out of the Bruce area?

Response

a) The OPA is not aware if a specific end of useful life date has been identified for the Bruce B units. The OPA understands that the asset owner will make such a determination based on the assessment of the condition and performance of each of the Bruce B units.

For planning purposes, the OPA is using publicly available information prepared by Bruce Power and which indicates the end of 2017 as the date for refurbishing the 1st Bruce B unit, followed by the remaining units being refurbished on a staggered basis commencing one year following this date (i.e., end of 2018). It has been assumed that all Bruce B units would be refurbished by 2023.

b) The retirement of Bruce B was considered as part of the need for the proposed project. As part of the need for increased transmission capability from the Bruce transmission system, the OPA assumed that the level of nuclear generation available from the Bruce plant will continue to be in the 6000-7000 MW range (equivalent to four 750 MW Bruce A units and four 850 MW Bruce B units). This assumption:

- recognizes the on-going need for significant amount of nuclear power in the future;

- is consistent with the Minister's June 13, 2006 directives which states "Plan for nuclear capacity to meet base-load electrical requirements but limit the installed in-service capacity of nuclear power over the life of the plan to 14,000 MW";
- considers the fact that there are only three operating nuclear sites in Ontario to provide the 14,000 MW of nuclear capacity. Reduction of nuclear capacity at the Bruce site would mean higher incremental capacity additions would have to be added (most likely) at the Darlington site, necessitating expansion of the transmission system from the Darlington plant to the east part of the Greater Toronto Area; and
- recognizes that the Bruce plant, being a major center of nuclear power generation, has the available infrastructure, community support, human resources and operator's interest.

Please also refer to the Technical Conference (see Day 1 Technical Conference Presentation Exhibit KT.1 slide 21 and transcript pages 19 to 20).

Bruce Power has indicated that, to maintain nuclear capacity at the Bruce plant at the end-of-life of the Bruce B units, these units could be refurbished or be replaced by new built units. Bruce Power has initiated environmental assessment work for the new build option. For the purpose of carrying-out financial evaluation of the proposed project, the OPA assumes the scenario that the Bruce B units would be refurbished at their end-of-life (please refer to the response to Pollution Probe Interrogatory 7).

Energy Probe INTERROGATORY #7 List 1

Interrogatory

Issue Number: 1.4
Issue: Is the project suitably chosen and sufficiently scalable so as to meet all reasonably foreseeable future needs of significantly increased or significantly reduced generation in the Bruce area?

Ref B/Tab 6/Sch 5

a) How is existing wind generation in the Bruce connected to the 500 kV network?

b) What facilities will HONI need to construct to connect future wind generation in the Bruce to the 500 kV network?

Response

a) Large wind generation proponents construct their own transmission facilities up to a location adjacent to a Hydro One transmission corridor or to an existing Hydro One transformer station. They maintain ownership of these dedicated facilities. Hydro One then makes a connection from the wind generators' facilities to its own transmission facilities at the generators' cost. After connecting to the Hydro One system at the 230 kV level the generation then feeds into the 500 kV network.

Below is a description of how various projects in the Bruce area are interconnected.

- Melancthon Wind Farm. It is connected to Hydro One's 230 kV transmission circuit B5V in between Orangeville TS and Hanover TS. B5V in turn connects to the rest of the Grid at Bruce A TS, Orangeville TS and Hanover TS.
- Ripley Majestic Wind Farm. It is connected to Hydro One's 230 kV transmission circuits B22D and B23D at a location in between Bruce A TS and Wingham TS. These circuits in turn connect to the rest of the grid at Bruce A TS, Detweiler TS (in Waterloo) and Seaforth TS
- Kingsbridge I Windfarm. It connects to Hydro One's Goderich TS at 27.6 kV via two dedicated 27.6 kV circuits owned by the generator. Goderich TS is connected to a 115 kV circuit known as M18 which in turn connects to Seaforth TS where it is connected to 230 kV circuits B22D and B23D which in turn connect to Bruce A TS and Detweiler TS

b) Future wind generation projects that are transmission connected will connect to the grid in a manner similar to the above projects and as indicated in the response to part (a). That is, the generator will build its own transmission facilities up to an existing Hydro One facility and Hydro One will make the connection between the generator

and the Hydro One facility at the generator's costs. If any modifications are required to any existing Hydro One facility as a result, these modifications are also at the generator's cost. Connections made at voltages below 500kV will feed into the 500kV network.

Energy Probe INTERROGATORY #8 List 1

Interrogatory

Issue Number: 2.1
Issue: Have all reasonable alternatives to the project been identified and considered?

Ref B/Tab 3/Sch 1

Ref B/Tab 6/Sch 5/Appendix 5

The first referenced schedule examines five potential alternatives all of which are at 500kV.

a) Has HONI, OPA or IESO conducted any studies to determine whether the existing and potential wind generation in the Bruce area could be connected to current or future 230 kV systems?

b) If so, please provide the studies. If not, please explain why such studies are not appropriate to determine alternatives.

Response

a) Yes. The IESO has conducted System Impact Assessments (SIA) and Hydro One has conducted Customer Impact Assessments (CIA) for these connections

b) Links to the SIA reports are provided below. Information contained in the CIA reports relates to customer-specific connection circumstances. Terms and conditions of the CIA as well as the Transmission System Code preclude public disclosure and dissemination of such information without prior customer consent. Non-disclosure of customer - specific information was addressed in Hydro One's correspondence to the Board dated February 26, 2008 and in respect of Paragraph 3 of Procedural Order No. 5.

Goderich Kingsbridge 1 Wind Farm
http://www.iemo.com/imoweb/pubs/caa/caa_PAReport-PortAlbertWindGen.pdf

Enbridge Underwood Wind Farm
http://www.iemo.com/imoweb/pubs/caa/caa_SIAReport_2004-143.pdf

Ripley Majestic wind Farm
http://www.iemo.com/imoweb/pubs/caa/caa_SIAReport_2004-125.pdf

Melancthon I wind Farm http://www.iemo.com/imoweb/pubs/caa/caa_SIA_2003-103.pdf plus http://www.iemo.com/imoweb/pubs/caa/caa_SIA_2003-103_App.pdf

Melancthon II wind Farm
http://www.iemo.com/imoweb/pubs/caa/caa_SIAAddendum_2003-103.pdf

Kingsbridge II Wind Farm
http://www.iemo.com/imoweb/pubs/caa/caa_SIAReport_2004-114.pdf

Energy Probe INTERROGATORY #9 List 1

Interrogatory

Issue Number: 2.1
Issue: Have all reasonable alternatives to the project been identified and considered?

Ref B/Tab 3/Sch 1

Ref B/Tab 6/Sch 5/Appendix 5

The second referenced schedule contains plans on page 37 to connect 800 MW of prospective wind generation in the Byng inlet area directly to Essa TS by way of 230 kV lines.

Please explain why 230 kV connection is viable in this situation but not in the Bruce situation.

Response

The subject 230 kV lines are connection lines required for wind generation development around Byng Inlet. Unlike network transmission lines such as the Bruce to Milton line, connection lines only transmit power generated by the generation resource which they directly connect, while network lines must accommodate the dynamic nature of power flows across the transmission system under both normal and contingency conditions. These power flows change continuously as a result of the demand/supply balance on the entire power system. As well, the consequence of outages to connection lines is that their associated generation would be disconnected, while outages to network lines have the potential to affect the entire interconnected transmission network with potential widespread disruptions (such as the 2003 Blackout).

With these considerations, connection lines are sized to carry the maximum output from their associated generating facility. In the case of Byng Inlet wind development, this amounts to 800 MW over two 230 kV circuits. The maximum transfers on these circuits can be determined with good certainty since they will not carry power transfers from other power sources. As an outage of the connection line will only affect the generation connected, the configuration and design of the connection lines will be determined by the amount of generation loss that is considered acceptable by the IESO to maintain system reliability, and the planned availability level for the connected resource as required by the generator.