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**Susan Frank**

Vice President and Chief Regulatory Officer  
Regulatory Affairs



BY COURIER

September 23, 2010

Ms. Kirsten Walli  
Secretary  
Ontario Energy Board  
Suite 2700, 2300 Yonge Street  
P.O. Box 2319  
Toronto, Ontario M4P 1E4

Dear Ms. Walli:

**EB-2010-0229 – Hydro One Networks Request for Exemption from Certain Sections of the Distribution System Code – Hydro One Networks Responses to Interrogatory Questions**

Please find two (2) hard copies of responses provided by Hydro One Networks to Interrogatory questions.

Below is the Tab numbers for each intervenor

Tab	Intervenor
1	Ontario Energy Board
2	Ontario Power Authority

An electronic copy of the Interrogatories, have been filed using the Board's Regulatory Electronic Filing System.

Sincerely,

ORIGINAL SIGNED BY SUSAN FRANK

Susan Frank

Attach

c. Intervenors (electronic Only)

**Ontario Energy Board (Board Staff) INTERROGATORY #1 List 1**

**Interrogatory**

Issue

**DSC REQUESTED AMENDMENTS IN REGARD TO UNFORESEEN TECHNICAL ISSUES WITH RENEWABLE ENERGY GENERATION PROJECTS**

Please confirm if the investments by Hydro One to connect any of the generators described in the application can be reasonably expected at the time of construction to connect any other customers to the distribution system based on documents such building permits etc.

**Response**

It is difficult to speculate on the information that may be available at the time of construction, but Hydro One offers the following assessment based on current information.

The primary purpose for these investments is to correct the technical issues which have surfaced, and not to allow more customer connections. At this time, the investments described in the Application for those projects impacted by the need for Grounding Transformers and those projects impacted by Transformers with Dual Secondary Windings are not expected to be used, at the time of connection, to connect any other customers. The investments described in the application for those projects impacted by Feeder Distance Limitation may, at the time of construction, see new customers arrive who may benefit from these investments; however at this time, there are no other customers who are expected to benefit from these investments.

Hydro One's rationale for these judgments is the following:

The investment in grounding transformers will benefit only those generators who are not compliant with the new grounding guideline in Hydro One's Technical Interface Requirements (TIR).

The intent of the Dual Secondary Winding Transformer investments is to correct power quality issues and not to increase capacity. These investments will benefit only those generators who were allocated capacity at these stations before the severe constraint on thermal capacity was identified. Now that the constraint is known, however, Hydro One no longer accepts applications beyond these constraints; and as a result, there will be no further projects which benefit from these investments.

Filed: September 23, 2010

EB-2010-0229

Exhibit I

Tab 1

Schedule 1

Page 2 of 2

1 It is possible that investments in new lines and conductor upgrades to mitigate distance  
2 limitations will benefit other generator customers. However, these investments cannot  
3 benefit new load customers, because these sections of line will be dedicated to generator  
4 customers due to the voltage fluctuation on these sections of line. Therefore, if a new  
5 generator customer were to suddenly appear who could connect to the section of  
6 dedicated line, it is possible that it might benefit from the investment. Currently,  
7 however, Hydro One does not have applications from other generator customers who  
8 might derive such benefit.  
9

**Ontario Energy Board (Board Staff) INTERROGATORY #2 List 1**

**Interrogatory**

Issue

**DSC REQUESTED AMENDMENTS IN REGARD TO UNFORESEEN TECHNICAL  
ISSUES WITH RENEWABLE ENERGY GENERATION PROJECTS**

Does Hydro One intend to charge generators for these costs, in part or full, in the event that the Board does not grant the requested exemptions? Please provide information on alternatives being considered by Hydro One.

**Response**

In the event that the Board does not grant the requested exemptions, Hydro One will have no option but to charge the generators, in full, for these costs.

**Ontario Energy Board (Board Staff) INTERROGATORY #3 List 1**

**Interrogatory**

Issue

**DSC REQUESTED AMENDMENTS IN REGARD TO UNFORESEEN TECHNICAL ISSUES WITH RENEWABLE ENERGY GENERATION PROJECTS**

Ref: (a) Exh B/Tab 1/Sch 1/p.3/lines 5-12

Ref: (b) Exh B/Tab 1/Sch 1/p.7/ lines 13-21

- (i) At Reference (a), page 3, lines 5-6, please confirm whether or not the concerns outlined in this application are addressed in Hydro One's existing approved Green Energy plan.
- (ii) Does Hydro One intend to file an updated Green Energy plan? If so, when is that filing planned?
- (iii) At Reference (b), Hydro One indicated that it can be argued that the noted investments should rightly qualify as "eligible investment" costs, as set out in Ontario Regulation 330/09 and section 79.1(5) of the Act. Please provide detailed eligibility criteria that support this argument, for each of the three areas addressed:
  - Distance Limitation;
  - Transformers With Delta-Y Winding Configuration;
  - Dual Winding Secondary Transformers.

**Response**

- (i) Hydro One Distribution's approved Green Energy Plan provided for the costs of unspecified distribution expansion projects. The investments which are the subject of this Application are for renewable energy proponents whose distribution-connected generation projects are similar, but who applied for connection prior to the October 21, 2009, date.
- (ii) No, in lieu of filing an updated Green Energy Plan, Hydro One requests, as stated in Exhibit B, Tab 1, Schedule 1, page 3, lines 5-8, that the Board consider the Company's Green Energy Plan, approved in EB-2009-0096, to now be amended to include these investments. All of these investments would be considered renewable energy expansions that would therefore qualify for distributor funding, would be recorded in variance accounts and recovered from Provincial consumers under O. Reg. 330/09 and the Board's policy issued June 10, 2010.

(iii) The criteria for an eligible investment are quoted from the relevant sources below:

- “an investment in the construction, expansion or reinforcement of a distribution line, transformer, plant or equipment used for conveying electricity at voltages of 50 kilovolts or less that meets the criteria prescribed by regulation;” *Ontario Energy Board Act, 1998*, section 79.1(5), definition of “eligible investment”.
- “(2) The prescribed criterion for falling within the definition of an “eligible investment” under subsection 79.1 (5) of the Act is that the costs associated with the investment are determined to be the responsibility of the distributor in accordance with the Board’s Distribution System Code.” O. Reg. 330/09, s. 1 (2).

The investments determined to be the responsibility of the distributor in accordance with the Board’s Distribution System Code are the distributor’s investments in renewable energy expansion and renewable enabling improvements. Hydro One submits that the investments which are the subject of this Application may be considered as renewable energy expansion investments as follows:

- Distance Limitations
  - These investments would qualify as expansions, as they consist of new line construction and line upgrades, as defined in the Distribution System Code today.
- Delta-Y Transformers
  - These investments would qualify as expansions, as they consist of new distribution equipment upgrades, as defined in the Distribution System Code today.
- Dual Secondary Winding Transformers
  - Hydro One asks for treatment of these transformation investments as expansion investments, similarly to the treatment allowed by the Board for other large distributors.

If such treatment were approved, Hydro One requests that the Board consider the Company’s Green Energy Plan, approved in EB-2009-0096, to now be amended to include these investments, as noted in response to (ii) above.

The effect of the Board’s decision dated October 21, 2009, that resulted in the amendments to the Distribution System Code was that the cost responsibility rules which establish the two cost categories which are noted as the distributor’s responsibility (that is, renewable energy expansion and renewable enabling improvements) are applicable only to the generation proponents who applied for connection after October 21, 2009. Hydro One is requesting that that distinction effect in the amended DSC that resulted from the said decision of the Board be waived in this specific case, by granting an

1 exemption from the date distinction, for the reasons listed in this Application. Among the  
2 reasons, as noted in Exhibit B, Tab 1, Schedule 1, page 5, are that these proponents have  
3 complied with Hydro One's requirements and have already invested substantial amounts  
4 in their projects. Hydro One believes that under the circumstances described in this  
5 Application, the proponents should not be obligated to address costs to solve problems  
6 which were not known and could not have been reasonably anticipated at the time their  
7 contracts were executed.  
8

**Ontario Energy Board (Board Staff) INTERROGATORY #4 List 1**

**Interrogatory**

Issue

**DSC REQUESTED AMENDMENTS IN REGARD TO UNFORESEEN TECHNICAL  
ISSUES WITH RENEWABLE ENERGY GENERATION PROJECTS**

Ref: B/ Tab 1/Sch 1/p.8/lines 1-10

- (i) Notwithstanding the rationale used by Hydro One to support its application, please comment on the view that any decision by this Board in regard to deeming the investments in question as eligible investments under Ontario Regulation 330/09, would be exceeding its jurisdiction, since it would in effect be altering the intent of Ontario Regulation 330/09 and section 79.1(5) of the Act.

**Response**

Hydro One does not believe that granting the Application as requested by Hydro One would result in the Board exceeding its jurisdiction. Please refer to Exhibit I, Tab 1, Schedule 3, and Exhibit I, Tab 1, Schedule 9.



**Ontario Energy Board (Board Staff) INTERROGATORY #5 List 1**

**Interrogatory**

Issue

**DSC REQUESTED AMENDMENTS IN REGARD TO UNFORESEEN TECHNICAL ISSUES WITH RENEWABLE ENERGY GENERATION PROJECTS**

**Ref: (a)** Exh B/Tab 1/Sch 1/pp. 1-2/Sec 1.0 Introduction

**Ref: (b)** Presentation to The Ontario Smart Grid Forum titled “DG Integration Key to Smart Grid”, dated September 22, 2008, by Manager – Distr. Gen & Advance Grid Development, System Investment, Hydro One Networks. A copy is attached as Appendix “A” to Board Staff Interrogatories.

**Ref: (c)** Exh B/Tab 1/Sch 2/Sec 5/pp. 3-6, Table 1 (p. 4) & Table 2 (p. 6)

**Preamble:**

- In Reference (a), Hydro One stated in part that:

*“Hydro One has committed to connect a number of generators under the terms of Connection Impact Assessments (“CIAs”) and the (then) Connection Cost Recovery Agreements (“CCRAs,” currently referred to as Connection Cost Agreements or “CCAs”) made prior to Hydro One’s discovery of technical problems with these connections. **These problems are excessive voltage fluctuations in the case of generators connecting at a distance from the station (“distance limitations”)**...[bolding added for emphasis], All of these technical issues have the potential to adversely affect the provision of distribution services to other customers connected to Hydro One’s distribution system. Each of these issues arose as a result of the unique circumstances with the implementation of the renewable generation connections program. Hydro One has not experienced these types of problems previously and they could not have been reasonably foreseen.*

- 1 • In Reference (b), the evidence seems to indicate that Hydro One Distribution was  
2 aware of the implications of connecting distributed generation including voltage  
3 management under various conditions. For instance on page 8 of Reference (b),  
4 the illustrative graph shows the voltage variation profiles of three scenarios – No  
5 Gen, Max Gen @ Max Load, and Max Gen @ Min Load. Page 9 depicts the  
6 voltage profile (variation) for three cases – for a case “Without DG”, for a case  
7 with “2 X 9MW DGs near TS” and a third case with “Full DG penetration”.  
8
- 9 • Also in Reference (b), on page 12, the presentation includes a description on one  
10 of the “Challenges” described as: Rural Feeders – “Long, weak, light”  
11  
12 Low stiffness, low short circuit, poor voltage control; 50% 1-ph.  
13
- 14 • In Reference (c), the evidence indicate that the costs for the two groups “Projects  
15 with Longer-Term In- Service Dates” and “Projects with Lower Probability of  
16 Problems” are not yet very well defined and vary with an estimate of \$40 million.  
17
- 18 • Board staff also notes that since the mid 1980s, Hydro One and its predecessor  
19 Ontario Hydro connected many distributed generators on low voltage feeders at  
20 varying distances from transformer stations, including run-of-the river hydraulic  
21 generation whose electricity generation outputs are unpredictable. The impact on  
22 customers attributed to voltage fluctuation of the run-of the river hydraulic sites  
23 would be similar to the impact of other renewable resources such as photo-voltaic  
24 and wind generation.  
25

26 Questions:

- 27
- 28 (i) In light of the Hydro One Presentation depicted in Reference (b), and the  
29 experience gained from connection of run-of-the-river hydraulic generation to the  
30 distribution system, please explain why Hydro One indicates in Reference (a) that  
31 it has not experienced the excessive voltage fluctuation problem in the case of  
32 generators connecting at a distance from the station (“distance limitations”), and  
33 why this problem could not have been reasonably foreseen.  
34
- 35 (ii) Notwithstanding whether or not the noted problems could have been reasonably  
36 foreseen, are the magnitude of costs to deal with this issue of “distance  
37 limitations” material with respect to Hydro One Networks Inc.’s Distribution  
38 Revenue Requirement?

- 1 (iii) Notwithstanding whether or not the noted problems could have been reasonably  
2 foreseen, please indicate what oversight is needed to approve projects described in  
3 Reference (c) that have costs up to \$40 million with little information in regard to  
4 project definition.

5  
6 **Response**  
7

- 8 (i) The referenced presentation does not discuss the current feeder distance limitation issue.  
9 It provides a cursory overview of typical voltage issues using a simplistic, intuitive  
10 illustration rather than actual experience. .  
11

12 Hydro One was aware that the connection of distributed generation would impact feeder  
13 voltages with effects such as Temporary Over-Voltage (TOV). The voltage control issues  
14 that Hydro One referenced in the presentation of September, 2008 are issues that arise as  
15 a result of the constantly changing load and generation on a feeder. Specifically, voltages  
16 fluctuate because load and generation have an opposite effect on voltage; for  
17 example, higher load decreases feeder voltage while higher generation increases feeder  
18 voltage. This, however, is a very simplistic view. At the time, Hydro One did not  
19 have sufficient information to enable it to identify the extent to which voltages would  
20 fluctuate for each proposed connection, or the probability that a proposed connection  
21 would result in unacceptable voltage fluctuations.  
22

23 Today, however, Hydro One is aware of the much more complex nature of the voltage  
24 fluctuation problem and that it relates to the exponential affect of losses through the X/R  
25 impedance of the line and the variability of the generation output onto the distribution  
26 feeder.  
27

28 Although run-of-the-river generation does have some intermittent characteristics, these  
29 are significantly different from the intermittency of wind and solar generation. For  
30 example, both wind and solar generation are characterized by much steeper and faster  
31 ramp-up and ramp-down rates and the magnitude of ramp-ups and ramp-downs are, on a  
32 percentage basis, far greater than what is observed with run-of-the-river hydraulic  
33 generation. Although the lessons learned with run-of-the-river generation are informative,  
34 these lessons do not fully cover the issues faced by Hydro One with the connection of  
35 wind and solar generation. The most important distinction between the generation types  
36 is the level of variability and predictability; run-of-the-river generators have, relatively  
37 low variability compared to wind and solar generators. Additionally, run-of-the-river  
38 generators have much more control over their output than wind and solar generators.  
39 Another important fact is that in the 1980s, customer equipment was not as sensitive as it  
40 is today; today customers own far more electronic equipment that did not commonly exist  
41 among residential or even commercial customers. Even appliances, such as refrigerators  
42 and stoves now contain sensitive electronic equipment that may be susceptible to voltage  
43 fluctuations.  
44

- 1           To conclude, the experiences of the last two years have enabled Hydro One to better  
2           predict the circumstances where these problems arise and to develop the needed tests to  
3           identify them. This knowledge did not exist previously, and only when it became  
4           available was the Company able to begin to address the issue in a systematic and  
5           consistent manner for all projects with this potential issue.  
6  
7       (ii)   According to the default materiality thresholds in the Board's Filing Requirements, these  
8           expenditures are material.  
9  
10       (iii) Hydro One proposes that if this exemption is approved, these costs could be tracked in a  
11           variance account, for later disposition , and Hydro One is willing to provide after-the-fact  
12           reporting on the proposed investments if it would reassure the Board in its Decision.  
13

**Ontario Energy Board (Board Staff) INTERROGATORY #6 List 1**

**Interrogatory**

Issue

**DSC REQUESTED AMENDMENTS IN REGARD TO UNFORESEEN TECHNICAL  
ISSUES WITH RENEWABLE ENERGY GENERATION PROJECTS**

Ref: (a) Exh B/Tab 1/Sch 2/pp. 1-6

**Preamble:**

Notwithstanding Hydro One's submission that it lacked knowledge or experience in dealing with generators connecting at various distances from the transformer station, there is a view that the required investments as described by Hydro One in Reference (a), are expected of a distributor such as Hydro One Distribution in connecting distributed generators. The technical aspects of connecting distributed generators under changing cost responsibility arrangements are viewed as technical risks with associated costs. These risks are recognized in the form of a higher regulated rate of return.

- (i) Does Hydro One agree or disagree with the view expressed above?  
Please provide a detailed explanation with supporting reasons.

**Response**

- (i) Hydro One disagrees with the view above, as the Company's current ROE is not commensurate with the risks posed by the issues described in this Application. The Company's current ROE was established as part of the Board's process prior to the discovery of these technical issues.

**Ontario Energy Board (Board Staff) INTERROGATORY #7 List 1**

**Interrogatory**

Issue

**DSC REQUESTED AMENDMENTS IN REGARD TO UNFORESEEN TECHNICAL ISSUES WITH RENEWABLE ENERGY GENERATION PROJECTS**

**Ref: (a)** Exh B/Tab 1/Sch 2/pp. 3-6

(i) In regard to Reference (a), on page 5, for “Project with Near Term In-Service Dates, please provide specific information on each of the projects regarding:

(a) Location, name of supplying TS;

(b) Description of the feeder – length, location of load customers and their loads in kW or MW; location of generators, their types and size of each in kW or MW;

(c) Description of the problem and the solution, and cost.

(ii) When will Hydro One know, for each of the nine projects classed as, “Projects with Longer-Term In-Service Dates”, whether or not they will require similar treatment as the first group?

**Response**

(i) For each of the projects identified in the table below with “Near-Term In-Service Dates” the problem is that the feeder will experience voltage fluctuations, as a result of the generator, which will cause an adverse impact on existing customers.

Please note that the estimated costs of the mitigation measures has increased from the figures originally provided in Exhibit B, Tab 1, Schedule 2, Page 6. During the development of the detailed scope of work, Hydro One discovered that the original, preliminary scopes for certain projects were not technically feasible. To mitigate the technical issues, Hydro One had to develop a new plan and, accordingly, evaluated several new alternatives. The updated estimates provided in the table reflect the most cost effective, technically feasible solutions.

Projects With Near Term In-Service Dates

Project ID	Size (MW)	Type	TS	TS Feeder	DS Station	DS Feeder	Distance from Station (km)	Feeder Total Min Load (MW)	Feeder Total Peak Load (MW)	Feeder Length (KM)	Other Generators  ID – Type – Size - Distance from Station	Location	Load Info	Proposal	Estimated Costs (\$M)
1096	9.9	Wind	Malden TS	M7			33	4	11	33		Town of Harrow	<ul style="list-style-type: none"><li>213KW load 13 km from station</li><li>Essex Power load is on a different branch, 21 km from station (min load: 3.8MW, peak load: 9MW)</li></ul>	Dedicate roughly 15 km new line to the generators ID 1096 and 1097	0.02
1097	9.9	Wind	Malden TS	M7			33								
1099	9.9	Wind	Malden TS	M11			32	3.2	11.7	32		Town of Harrow	<ul style="list-style-type: none"><li>8 MW, 15 km from the station</li></ul>	Convert part of feeder M7, Kingsville TS to be a new branch on feeder M11, Malden TS and connect Generator ID 1099 (Harrow IV) to this new branch. There are also re-conductor and feeder reconfiguration works involved.	2.5
8	10	Wind	Bell River TS	M2			24	1.78	6.81	24		Essex County	<ul style="list-style-type: none"><li>Two DSs on feeder M2: Belle River DS (4.3 km from Bell River TS, min load: 0.61 MW, peak load: 2.33 MW); and</li><li>Haycroft DS (20km from Bell River TS, min: 0.67 MW, peak load: 2.56 MW).</li><li>The rest of load distributed along the feeder M2)</li></ul>	At this time, we propose to dedicate the old 115 kV tower line section of M2 feeder, located downstream of Haycroft DS to the end of the feeder, to the Generator. Load customers shouldn't be allowed to connect to this section. There is a plan to remove this section in two years. A 3.6 km of 556Al new line must be built to connect the generator back to its proposed feeder.	1.2
645	1.3	Hydraulic	Cobden TS	M2	Northcote DS	F3	12.3		2.241	3 Phase main branch: 12.3 km  Distance between Northcote DS and Cobden TS: 19.7 km  There are several single phase sections are of many different branches: <ul style="list-style-type: none"><li>Total R-ph length: 24.4 km @ 2.1 km from the DS + 69.4 km @ the end of the 3ph conductor</li><li>Total W-ph length: 9.6 km @ 2.1 km from the DS + 2.5 km @ the end of the 3ph conductor</li><li>Total B-ph length: 42.5 km @ 2.1 km from the DS</li></ul>	<ul style="list-style-type: none"><li>11250 – Solar – 0.175 MW– 7 km</li><li>1237 – Solar – 2.95 MW- 21 km</li><li>819 – Biomass – 0.5 MW – 5 km</li></ul>	Whitewater Township	<ul style="list-style-type: none"><li>The loads are primarily residential roads distributed along the single phase sections. Load Downstream of the DG: 1226 kW</li></ul>	Re-conductor 5.7 km of line to 556AL conductors, starting from the PCC of the subject DG upstream towards Havelock TS	0.32
89	10	Wind	Lauzon TS	M29			25	3.3	9.63	25	<ul style="list-style-type: none"><li>960 – Diesel – 1 MW – 22 km</li><li>13100 – Solar – 0.5 MW – 10 km</li><li>13510 – Solar – 0.235 MW – 11 km</li></ul>	Essex County	<ul style="list-style-type: none"><li>One DS on feeder M29: Maidstone DS (15 km from Lauzon TS, load: 2.75MW);</li><li>350kW load at 5km from station, and a 9MW load 21 km from station)</li></ul>	Build 4.3 km new line to move the PCC closer to the station. The last 1.5km of this new line should be dedicated	1.2

- 1 (ii) Hydro One continues to analyze the results of technical studies and evaluate alternatives;
- 2 some alternatives being examined may require generator input, and final details are unlikely
- 3 to be finalized until early 2011.
- 4



**Ontario Energy Board (Board Staff) INTERROGATORY #8 List 1**

**Interrogatory**

Issue

**DSC REQUESTED AMENDMENTS IN REGARD TO UNFORESEEN TECHNICAL ISSUES WITH RENEWABLE ENERGY GENERATION PROJECTS**

Ref: (a) Exh B/Tab 1/Sch 1/pp. 1-2/sec 1.0 Introduction

Ref: (b) Exh B/Tab 1/Sch 3/p. 2/Sec 3.0 and Section 5.0

**Preamble:**

- In Reference (a), Hydro One stated in part that:

*“Hydro One has committed to connect a number of generators under the terms of Connection Impact Assessments (“CIAs”) and the (then) Connection Cost Recovery Agreements (“CCRAs,” currently referred to as Connection Cost Agreements or “CCAs”) made prior to Hydro One’s discovery of technical problems with these connections. **These problems are ..... over-voltage conditions identified with generators using a step-up transformer with a Delta-Y winding configuration [bolding added for emphasis]**”*

- In Reference (b), Sec 3, Hydro One indicated that it was aware of the trade off between the two standards.
- In Reference (b), Sec 5, Hydro One indicated that the total cost of the program is between \$4.5 and \$6.5 million.
  - (i) Given that Hydro One was aware for some time of the trade off between the two standards, please provide a response to a view that the responsibility for changing its transformer specification standard should rest with Hydro One Distribution, and the associated cost responsibility should be that of Hydro One Distribution and not the cost responsibility of the Hydro One distribution rate payers or the provincial electricity consumers.
  - (ii) Notwithstanding the argument of the cost responsibility, please provide reasons for viewing the amount of investment as sufficiently material enough to warrant efforts to assign the responsibility to others.

1 **Response**

2  
3 (i) Hydro One's investigations of the step-up transformer connection configuration for  
4 distribution connected generators, from mid-2004 on, determined that no clear  
5 advantage could be identified for one standard over the other, until the time that the  
6 RESOP program was placed on hold. During that time, therefore, Hydro One decided  
7 to use a Delta-Y transformer configuration for the reasons given in Exhibit B, Tab 1,  
8 Schedule 3, page 2, lines 8-22. This decision was aligned with the practice generally  
9 accepted in the industry.

10  
11 Hydro One changed its transformer specification standard only after observations of  
12 generator connections that showed high over-voltages (~150%) for a generation  
13 facility connected some distance from the station. More studies were conducted on  
14 other projects to gauge the extent of the problem. The recommended change to Y-  
15 Delta step-up transformers, on the four-wire system, became conclusive in late 2008  
16 when Hydro One Distribution changed its CIAs to require generators to use a Star-  
17 Delta connection.

18  
19 In March 2009, the Technical Interconnection Requirements Document was first  
20 published as a draft and its stakeholdering began. It identified the change to Y-Delta  
21 step-up transformers, on the four-wire system. Between Fall 2008 and March 2009,  
22 Hydro One had also communicated the change through different forums.

23  
24 Hydro One believes that its decisions were sound and reasonable, in light of the  
25 ambiguity which existed throughout this period. Accordingly, the Company believes  
26 that the investments proposed to address this issue are prudent and that it should be  
27 allowed to recover them.

28  
29 (ii) Hydro One anticipates these investments to be material, according to the Board's  
30 default materiality threshold in its Filing Requirements.  
31

**Ontario Energy Board (Board Staff) INTERROGATORY #9 List 1**

**Interrogatory**

Issue

**DSC REQUESTED AMENDMENTS IN REGARD TO UNFORESEEN TECHNICAL  
ISSUES WITH RENEWABLE ENERGY GENERATION PROJECTS**

Ref: (a) Exh B/Tab 1/Sch 4/pp. 1-6

Ref: (b) Notice of Amendment to a Code – Amendments to the  
Distribution System Code (“DSC”), EB-2009-0077, dated  
October 21, 2009, Part III “Summary of Comments.....” -  
Sec B “Cost Responsibility for Transformer Stations”

**Preamble:**

- At Ref: (b), it is stated in part that:

*“Some stakeholders commented on the issue of cost responsibility for transformer stations, noting among other things that a transformer can be owned by either a distributor or a transmitter and that the definitions or descriptions of the terms “expansion” and “renewable enabling improvement” do not refer specifically to transformer stations.*

*At the present time, all transformer stations owned by a distributor have been deemed by the Board to be distribution assets. As such, they form part of the distributor’s rate base, and the Board confirms that they are therefore part of the distributor’s main distribution system for the purposes of the DSC. As a result, cost responsibility for such a transformer station would be determined in the same manner as for all other modifications or additions to the main distribution system of the distributor to whose system the renewable generation facility is connecting.*

*Were it to be the case that a transformer station owned by a distributor was not deemed to be a distribution asset (in other words, the transformer station is a transmission asset), then the station would not form part of the main distribution system of the distributor to whose system the renewable generation facility is connecting. In such a case, cost responsibility for the transformer station would be the same as for upstream costs; namely, the cost of the transformer station would be passed through to and borne by the generator.*

*The Board recognizes that its approach to cost responsibility under the DSC results in a treatment of transformer station costs that varies depending on the classification of the transformer station, and will be mindful of this implication*

1 *when it considers future Ontario Energy Board - applications where the*  
2 *classification of a distributor-owned transformer station is involved. “*  
3

- 4 • Board staff notes that in Hydro One’s case, the TS dual winding transformer issue is a  
5 transmitter issue as opposed to a distribution issue, and would therefore be subject to  
6 the cost responsibility criteria of the Transmission System Code.  
7

8 Questions:  
9

- 10 (i) In light of the evidence in Reference (b), with excerpts depicted in the Preamble  
11 above, the Board is aware of situations where reinforcements to a transformer  
12 station classed as a transmission asset is based on a “User Pay” approach as set out  
13 in the Transmission System Code, please explain, the rationale for reopening that  
14 issue.  
15  
16 (ii) In the Notice of Amendment noted in Reference (b), the Board outlined its  
17 understanding of the issue, recognizing the differences between the two Codes in  
18 regards to cost responsibility – the Transmission System Code and the Distribution  
19 System Code. Please confirm that Hydro One is aware of the Board’s view and  
20 provide Hydro One’s view.  
21  
22 (iii) Notwithstanding the views expressed by the Board and quoted above [excerpts from  
23 Reference (b)], please provide an estimate of the amount of investment, over the  
24 medium term, that Hydro One would be required to undertake to address the  
25 unbalanced flows in Dual Winding Secondary Transformers. Please provide this  
26 information in a Table similar to Table 1, page 6 of Reference (a) setting out in  
27 separate columns, the location, the number of generation projects, and the total  
28 capacity of these projects in MW.  
29  
30 (iv) Given that the Transmission System Code criteria regarding cost responsibility for  
31 transformer stations is based on User Pay principles, would Hydro One be seeking a  
32 new Transmission cost recovery mechanism to facilitate the process?  
33

34 Response  
35

- 36 (i) Hydro One understands the Board’s policy and is not reopening this issue. With respect  
37 to the Transmission System Code rules, the transmission-connected customer in this  
38 case is Hydro One Distribution, which requires the transmitter to make investments in its  
39 dual secondary winding transformers, driven by distributed generation connections to  
40 Hydro One Distribution’s system. Hydro One Distribution must recover these upstream  
41 costs so that it can compensate the transmitter for the work as required by the  
42 Transmission System Code cost responsibility rules. Hydro One believes that  
43 recovering the costs from the generation proponents who are the subject of this  
44 Application (the ultimate ‘users’) is inappropriate in these circumstances and, based on

- 1 the Company's understanding of the Board's policy, therefore asks for exceptional  
2 treatment for these specific investments.
- 3
- 4 (ii) Hydro One is aware of the Board's view that if a transmitter-owned asset must be  
5 upgraded or reinforced to accommodate a generator connection to the distributor's  
6 system (which is considered an 'upstream' investment), the cost for the upgrade or  
7 reinforcement must be borne by the applicant. Hydro One submits that the extenuating  
8 circumstances described in this Application require exceptional treatment, as noted  
9 above.
- 10
- 11 (iii) Various measures are being used to address these issues. These measures range from  
12 relatively low-cost studies to determine the reverse flow capability of the individual  
13 transformers, to investments to replace individual transformers with those that have the  
14 required reverse flow capability.
- 15

16 At the time of filing on June 30, 2010, and since then, Hydro One has been re-  
17 prioritizing work on its transformers, enabling the Company to begin replacements of  
18 some of those with dual secondary windings which are the most problematic. Hydro  
19 One also had proactively undertaken studies to identify the steps required to address the  
20 limitations associated with dual secondary winding transformers, an activity which, in  
21 some cases, has addressed the issue. The following table gives a summary of the costs  
22 associated with the measures that the Company anticipates will be required to address  
23 the individual transformer limitations at the present time.

24

25 Although the table identifies relatively low-cost measures, there is still a residual risk  
26 that one or more of the manufacturers' studies that Hydro One has commissioned will  
27 identify a requirement to replace one or two individual transformers at a cost of  
28 approximately \$5 million each. This will not be known, however, until all of the studies  
29 have been completed and the results analyzed.

1

Transformer	Measure	Estimated Cost at this time	Number of Projects	MW Enabled
Brantford T3	Transformer being replaced by another program	0	3	10.1
Brantford T4	Transformer being replaced by another program	0		
Buchanan T3	Further internal study addressed issue	0	3	22.85
Buchanan T4	Further internal study addressed issue	0		
Kent T1	Manufacturers' Study commissioned (\$15k) and installation of monitoring (\$75k)	\$90k	9	77.25
Kent T2	Manufacturers' Study commissioned (\$15k) and installation of monitoring (\$75k)	\$90k		
Modeland T4	Transformer being replaced by another program	0	7	61.6
Orangeville T1	Manufacturers' Study commissioned (\$15k) and installation of monitoring (\$75k), A feeder swap (\$300k) will likely be necessary to completely solve reverse flow issue	\$390k	7	53.9
Orangeville T2	Manufacturers' Study commissioned (\$15k) and installation of monitoring (\$75k). The feeder swap done for Orangeville T2 will likely also be necessary.	\$90k		
Talbot T3	Manufacturers' study commissioned (\$35k). Will likely confirm that expected levels of reverse flow are acceptable	\$35k	1	18.8
Talbot T4	Manufacturers' study commissioned (\$35k). Will likely confirm that expected levels of reverse flow are acceptable	\$35k		
Malden T1	Transformer was replaced in June 2010 by another program	0	7	50.05
Malden T2	Transformer being replaced by another program	0		

2

3 (iv) No, Hydro One Distribution does not believe that a new transmission cost recovery  
4 mechanism would be needed. The Company proposes that if this Application is  
5 approved, Hydro One Distribution would make a capital contribution to the transmitter  
6 (Hydro One Transmission) for the relevant incremental mitigation work. This capital  
7 contribution would be consistent with the transmission cost recovery mechanism  
8 specified in the TSC. Then, and again subject to the Board's approval of this  
9 Application, Hydro One would recover the funding for the capital contribution in a  
10 subsequent proceeding, as described in Exhibit I, Tab 1, Schedule 5.

**Ontario Energy Board (Board Staff) INTERROGATORY #10 List 1**

**Interrogatory**

Issue

**DSC REQUESTED AMENDMENTS TO ADDRESS PROCESSING ISSUES FOR  
LARGE RENEWABLE ENERGY GENERATION PROJECTS**

Ref: (a) Exh C/Tab 1/Sch 1/p.1/lines 18-24

**Please have the IESO and Hydro One Transmission, as required, provide the  
pertinent information needed in this interrogatory.**

(i) Please provide a Table identifying all the projects that are classed as  
large, and for each project provide a column for each of the following:

(a) the size of the project;

(b) date when application was filed with the IESO to complete the System  
Impact Assessment ("SIA") study;

(c) date when the request was submitted to Hydro One Transmission  
to complete the Customer Impact Assessment ("CIA") study.

**Response**

(i) As noted in Exhibit I, Tab 1, Schedule 11 and Exhibit I, Tab 1, Schedule 12, Hydro  
One Distribution has only just recently submitted a complete SIA/Tx CIA  
application for a large embedded generation facility to the IESO/Hydro One  
Transmission.

The Table below contains information about applications that Hydro One  
Distribution is processing from large generation proponents who have applied to  
connect to its distribution system under the FIT Program.

Filed: September 23, 2010

EB-2010-0229

Exhibit I

Tab 1

Schedule 10

Page 2 of 2

<b>Project ID Number</b>	<b>Project Size (MW)</b>	<b>Dx CIA Application Date</b>	<b>SIA Application Date</b>	<b>Tx CIA Application Date</b>
11,690	10.8	5/10/2010	NA	NA
11,700	19.5	5/11/2010	NA	NA
11,720	23	5/11/2010	NA	NA
11,870	18	5/13/2010	Sept 14, 2010*	Sept 14, 2010*
12,270	20	5/21/2010	NA	NA
12,290	22.5	5/21/2010	NA	NA
12,430	18.4	5/26/2010	NA	NA
12,610	20	5/28/2010	NA	NA
12,750	11.5	5/31/2010	NA	NA
12,800	30	6/1/2010	NA	NA
12,810	10.25	6/1/2010	NA	NA
12,860	16.4	6/3/2010	NA	NA
*Hydro One Distribution has very recently applied to the IESO/Hydro One, the application date is subject to change based on deemed degree of completeness.				



**Ontario Energy Board (Board Staff) INTERROGATORY #11 List 1**

**Interrogatory**

Issue

**DSC REQUESTED AMENDMENTS TO ADDRESS PROCESSING ISSUES FOR  
LARGE RENEWABLE ENERGY GENERATION PROJECTS**

Ref: (a) Exh C/Tab 1/Sch 1/Section 1.0 INTRODUCTION/pp. 1-2

**Please have the IESO and Hydro One Transmission, as required, provide the  
pertinent information needed in this interrogatory .**

**Preamble:**

In the evidence at Reference (a), it is stated in part that:

*“Hydro One believes that this six-month timeline is generally feasible for small and mid sized generators, as their review consists of a distribution connection impact assessment (“distribution CIA”) and a potential Transmission Station (“TS”) review (where needed). However, the IESO’s Market Rules require that large generator connection applications must also undergo a System Impact Assessment (“SIA”) by the IESO and a Transmission Customer Impact Assessment by Hydro One Transmission. Ontario Regulation 326/09 made under the Electricity Act, 1998, stipulates up to 150 days to accommodate these studies. Should upgrades to the transmission system be required as a result of these assessments, further time is needed to develop the scope of work and detailed cost estimates. These additional time requirements could result in the removal of the proponent’s capacity allocation well before the completion of the cost estimates and the CCA”.*

**Questions:**

- (i) Please have the IESO provide a Table listing for each distribution connected generator project that is classed as large, with a column for each of the following:
- (a) the name of the distributor in whose territory the large project is located;
  - (b) the size of the generation project;
  - (c) date when application was filed with the IESO to complete the SIA study;
  - (d) date when Hydro One Transmission received the request to complete the CIA study;
  - (e) expected completion date.

- 1 (ii) How many SIAs did the IESO managed to complete within the 150 day period set  
2 out in Ontario Regulation 326/09. Please identify these projects.  
3
- 4 (iii) How long (on average) is it taking for the IESO to complete an SIA for distribution  
5 connected generators of 10 MW or larger?  
6
- 7 (iv) Please provide the scope of a typical SIA study that was performed in the past on  
8 distribution connected generators classed as large (10 MW or larger). Please  
9 compare that SIA scope to a scope of a larger transmission connected generator.  
10 Please comment on the view that for distribution connected generation projects, the  
11 IESO is not likely to carry out a full SIA for each project. Please provide a response  
12 for each of the following generator capacity ranges:  
13
- 14 • 10-15 MW,
  - 15 • 5-20 MW,
  - 16 • 20-30 MW,
  - 17 • Larger than 30 MW.
- 18
- 19 (v) It is viewed by some that the processing issues identified may be generic in nature  
20 and could potentially affect other distributors. Does Hydro One Distribution believe  
21 that the identified issues are specific to large renewable generators connecting to  
22 Hydro One's distribution system? If so, please provide a detailed explanation.  
23

24 **Response**  
25

26 As stated in the IESO's Market Rules, a connection applicant, in the context of SIAs, is a  
27 "distributor in whose distribution system a market participant or person is or intends to be  
28 connected as an embedded generator whose generation facility is or will be rated greater  
29 than 10 MW, that seeks to establish a new or modify an existing connection pursuant to  
30 section 6.1.6 of Chapter 4;" (see also Market Manual 2.10, Connection Assessment and  
31 Approval Procedure (MDP PRO 0048)). Accordingly, the projects of concern in this  
32 Application are those for which the rated capacity is greater than 10 MW and, therefore,  
33 classified as 'large' by the Distribution System Code.  
34

- 35 (i) The table below, prepared by the IESO, lists the only complete SIA application that  
36 the IESO has received to date for large, distribution-connected generation projects  
37 awarded a FIT contract.  
38  
39

<b>Distributor</b>	<b>Generator Size (MW)</b>	<b>Complete SIA Application Received (IESO) Date</b>	<b>CIA Study Request Date</b>	<b>Expected SIA Completion Date</b>
Thunder Bay Hydro	16.5	September 9, 2010*	September 9, 2010	February 4, 2011
Hydro One Distribution	18	September 14, 2010**	September 14, 2010**	**

\*Note, an incomplete SIA application was received on July 26, 2010.

\*\*Note, Hydro One Distribution has very recently applied to the IESO/Hydro One, the application date is subject to change based on deemed degree of completeness.

(ii) The IESO has yet to complete an SIA within the 150-day period set out in O. Reg 326/09, as the process has not reached the end of the 150-day period for any of the complete applications received.

(iii) As indicated in Part (ii) above, the IESO has not yet completed an SIA for a distribution-connected generator of greater than 10 MW.

As required by O. Reg. 326/09, both the IESO and Hydro One Transmission have revised their internal processes to meet the 150-day completion requirement for the SIA/Transmission CIA.

Prior to O.Reg 326/09 coming into force, however, the completion time for SIAs for large, embedded generators has been longer than 150 days. This duration is attributed primarily to the following factors:

- Historically, distributors would submit SIA applications based on the generator proponent's preliminary project design information. As the project progressed, proponents would often alter the project's design and specifications, resulting in pauses in the process at the request of applicants and in the repetition of studies.
- In the past, the SIA work started as soon as the SIA agreement was executed, without regard for the SIA application's completion status. The verification process, undertaken to retrieve all the information required by the IESO and transmitter to carry on the connection assessment, was a lengthy, iterative process that included the IESO, transmitter, distributor and the generator.

Internal process changes by the IESO and Hydro One Transmission, and the nature of the FIT program, have allowed for some time efficiencies to be leveraged. These include:

- Verification and validation of the application occurs primarily before the application is deemed "complete".
- The nature of the FIT program and the renewable energy procurement process requires renewable generation applicants to perform a significant amount of

1 design and planning prior to applying to the OPA: the expectation of the IESO  
2 is that most of the design will be finalized prior to submitting an SIA  
3 application.

- 4  
5 • Due to the strict timelines mandated by O. Reg. 326/09, once an application is  
6 deemed complete, the IESO and the transmitter can no longer accommodate  
7 sizeable design changes without re-setting the 150 days Service Guarantee  
8 Clock (SGC), if still within the service guarantee period.

9  
10 (iv) The scope of an SIA study is not developed based on the generator capacity ranges  
11 listed above.

12  
13 A generator's impact on grid operations is determined by the strength of the local  
14 transmission grid and the point of connection to the grid, or, in the case of an  
15 embedded generator, the host facility's point of connection. For example, a project  
16 larger than 10 MW may have either a minimal or a very significant impact on grid  
17 operations, dependent upon individual project characteristics and the point of  
18 connection.

19  
20 The number of tests conducted as part of the SIA is determined on a project-by-  
21 project basis, based on project-specific characteristics. Depending on the project's  
22 location, performing an SIA for an embedded generation project may require  
23 virtually the same amount of work as that required for an SIA of a directly-  
24 connected generation project of a similar size.

25  
26 Projects located in weaker system areas require more detailed testing, independent  
27 of the system to which the project is connecting, than projects of similar size located  
28 in strong system areas.

29  
30 (v) No; Hydro One does not believe that the issues identified are specific to only large  
31 renewable generators connecting to Hydro One's distribution system.

**Ontario Energy Board (Board Staff) INTERROGATORY #12 List 1**

**Interrogatory**

Issue

**DSC REQUESTED AMENDMENTS TO ADDRESS PROCESSING ISSUES FOR  
LARGE RENEWABLE ENERGY GENERATION PROJECTS**

Ref: (a) Exh C/Tab 1/Sch 1/Section 1.0 INTRODUCTION/pp. 1-2

**Please have the IESO and Hydro One Transmission, as required, provide the  
pertinent information needed in this interrogatory**

**Preamble:**

In the evidence at Reference (a), it is stated in part that:

*“Hydro One believes that this six-month timeline is generally feasible for small and mid sized generators, as their review consists of a distribution connection impact assessment (“distribution CIA”) and a potential Transmission Station (“TS”) review (where needed). However, the IESO’s Market Rules require that large generator connection applications must also undergo a System Impact Assessment (“SIA”) by the IESO and a Transmission Customer Impact Assessment by Hydro One Transmission. Ontario Regulation 326/09 made under the Electricity Act, 1998, stipulates up to 150 days to accommodate these studies. Should upgrades to the transmission system be required as a result of these assessments, further time is needed to develop the scope of work and detailed cost estimates. These additional time requirements could result in the removal of the proponent’s capacity allocation well before the completion of the cost estimates and the CCA”.*

**Questions:**

- (i) How many Customer Impact Assessments (CIAs) has Hydro One Transmission completed for distribution connected large generators? Please provide a list of requests made by distributors other than Hydro One Distribution, and for each, provide the size of the generator.

(ii) How long (on average) is it taking for Hydro One Transmission to complete a CIA study for distribution connected generators of 10 MW or larger?

(iii) Please provide the scope of a typical CIA study that was performed in the past on a distribution connected generator that is classed as large (10 MW or larger). Please compare that CIA scope to the scope of a larger transmission connected generator. Please comment on the view that the CIA study for a large distribution connected generator is not likely to be comparable in scope and effort level to the scope and effort level that is required for a CIA study of a larger generator connected to the transmission system? In your response please provide information for a range of sizes such as 10-15 MW, 15-20 MW, and 20-30 MW (likely requiring dedicated feeders to be directly connected to a transformer station).

**Response**

It should be understood that, for distribution-connected generation projects, Hydro One Transmission undertakes CIA studies on large projects (that is, greater than 10 MW) only.

(i) At the current time, Hydro One Transmission has not completed any Customer Impact Assessments for FIT awarded, distribution-connected generators with a capacity greater than 10MW. Applications for such requests have been received recently, as noted below:

LDC	Size (MW)	Date Received
Thunder Bay Hydro	16.5	Sept. 9, 2010
<i>Hydro One Distribution*</i>	<i>18*</i>	<i>Sept. 14, 2010*</i>
*Hydro One Distribution has very recently applied to the IESO/Hydro One, the application date is subject to change based on deemed degree of completeness.		

(ii) As Hydro One Transmission has not completed any CIA studies for large embedded generators with a capacity greater than 10 MW under the new rules, an average timeline under the new rules is not yet available.

(iii) CIA studies have a similar scope of work for both transmission- and distribution-connected generation facilities. This includes the evaluation of the impact of the generation connection on fault and voltage levels of the transmission system, and is required to be done, regardless of the generator's nameplate capacity. The level of effort involved can vary, however, depending on the size of the project and project specific factors. Although Hydro One does not break down its effort according to the needs of projects classified in the size ranges proposed by the

1 Board, more consequential issues are likely to be revealed in the review of a  
2 project with greater capacity. Addressing these issues will therefore require more  
3 work.  
4

**Ontario Energy Board (Board Staff) INTERROGATORY #13 List 1**

**Interrogatory**

Issue

**DSC REQUESTED AMENDMENTS TO ADDRESS PROCESSING ISSUES FOR  
LARGE RENEWABLE ENERGY GENERATION PROJECTS**

Ref: (a) Exh C/Tab 1/Sch 1/Section 2.0 THE CURRENT SITUATION/pp.2-5

Ref: (b) Exh C/Tab 1/Sch. 1/p. 5/Diagram 1

**Please have the IESO and Hydro One Transmission, as required, provide the  
pertinent information or opinions as needed in this interrogatory.**

**Preamble:**

At Reference (a), Hydro One presents its understanding in regard to the current situation and described Phase 1 (3 months) and Phase 2 (5months), and ended the description of Phase 2, with a paragraph stating that:

*“Hydro One’s experience[bolding added for clarity] is that the steps in this phase are sequential, that is, that the IESO cannot begin the SIA until it receives the distribution CIA and similarly, that a prerequisite for beginning the Transmission Customer Impact Assessment is the receipt of the prior two reviews. The allowed time period for this phase is 150 days (O. Reg. 326/09).”*

**Questions:**

- (i) Please provide a detailed description of the “experience” referred to in Reference (a) that led Hydro One to believe that the steps described in Phases 1 and 2 are or should be sequential.
- (ii) Assume that the connection process can proceed in parallel fashion, whereby in a revised Phase 1, the following steps would commence simultaneously:
  - The distribution Connection Impact Assessment (DX-CIA);
  - The Host Distribution (Dx-CIA) -if applicable;
  - The IESO’s SIA;
  - The Transmitter’s Customer Impact Assessment (Tx-CIA), if required



Assuming the process as described above is implemented; please describe the process that Hydro One Distribution needs to follow to ensure proper coordination between:

- The Applicant;
- The Embedded Distributor, where applicable;
- The Host Distributor (Assume Hydro One Distribution is the Host Distributor);
- The IESO; and
- The Transmitter (Assume Hydro One Transmission to be the Transmitter)

(iii) Please provide a revised Diagram 1, page 5 of Reference (b), assuming that the parallel process described in (ii) above is implemented, and in addition provide comments especially in regard to the (variable) Phase under the two possibilities discussed in pages 3 and 4 of Reference (a) under the heading Phase 3(Variable).

(iv) Please have the IESO and Hydro One Transmission comment on the feasibility of proceeding in a parallel fashion to reduce the overall timeline for distribution connected medium and large generators.

#### Response

(i) The IESO confirmed with Hydro One Distribution that the IESO requires a complete distribution Connection Impact Assessment (Dx-CIA) in order to begin work on a System Impact Assessment. More specifically, the IESO has identified that it needs the following information prior to the commencement of the SIA:

1. The generator's technical information, including the generator's equivalent representation on the low voltage bus of the transmission connection facility.
2. The intended mode of operation for the generator, including permissive reactive capability usage and impact on UFLS.
3. The list of distribution connection requirements.

This information is provided in the distributor's CIA.

Hydro One Transmission has confirmed that in order to complete the Transmission CIA, it requires the list of requirements identified in the IESO SIA study, which it must take into consideration when conducting its study. In addition, Hydro One Transmission obtains models that the IESO prepares for its study to ensure that both Hydro One Transmission and the IESO use consistent modeling data for the project under consideration. This arrangement avoids duplication of effort and improves coordination between agencies.

(ii) Hydro One cannot assume that all these processes may be done in parallel fashion. The response provided in part i) above provides the IESO's outline of

1 information required from Hydro One Distribution's CIA before the IESO may  
2 begin work on a System Impact Assessment, as well as Hydro One  
3 Transmission's information requirements of the SIA needed to undertake their  
4 Customer Impact Assessment. Please also see the response to part iv) of this  
5 Exhibit, below.

6  
7 (iii) Hydro One cannot provide this. Please see the responses to parts ii) and iv) of this  
8 question.

9  
10 (iv) Hydro One is of the view that it is not feasible to conduct all of these processes in  
11 parallel. The IESO and Hydro One Transmission have already developed a  
12 procedural understanding to help streamline their respective processes. By tightly  
13 coordinating the actions at both ends, both parties have achieved a more efficient,  
14 but not completely parallel, process aimed at completing all required assessments  
15 within 150 days, as required by Ontario Regulation 326/09. The process provides  
16 the procedural basis for sequencing actions by both parties, each action requiring  
17 input from one party and resulting in output to the other. Due to the nature of the  
18 two processes, full "parallel" processing cannot be achieved as some actions  
19 require the output of other action(s). For example, the IESO's dynamic stability  
20 tests require input from the transmitter's Protection Impact Assessment (PIA). As  
21 a result, the first 75 days of the 150-day period are dominated by IESO activities,  
22 supported by Hydro One Transmission's processes; while over the last 75 days,  
23 Hydro One Transmission's activities become more intense. On day 75, a  
24 significant amount of information is transferred from the IESO to Hydro One  
25 Transmission, including the (final) list of SIA requirements that enables Hydro  
26 One Transmission to ramp up its process. Toward the end of the period, the final  
27 list of Transmission CIA requirements is derived and transferred to the IESO,  
28 where it is used to finalize the SIA report. Included in Hydro One Transmission's  
29 75-day period is a 30-day customer review period; Hydro One Transmission has  
30 45 days to complete the Tx-CIA.

31

**Ontario Power Authority INTERROGATORY #1 List 1**

**Interrogatory**

**Reference: C1, Tab 1, Schedule 1, Page 1**

At this time, Hydro One is processing applications from over ten large generation proponents who have applied to connect to its distribution system under the FIT Program.

- a) Please confirm the number of applications that would be affected by Hydro One's proposal.
- b) Is it Hydro One's intention to apply this proposal to projects with a name plate capacity of 10MW or more, or to those projects greater than 10MW?
- c) Please provide the dates that these applications were received.
- d) Have the timelines required to complete the necessary studies been affected by the volume of applications received under the FIT program and if so, how?

**Response**

- a) At this time, Hydro One Distribution has received 13 Connection Impact Assessments applications from large generators. At this time, Hydro One Distribution believes these applications would be impacted.
- b) Hydro One's intention is to apply this proposal to projects with a name plate capacity of greater than 10MW.
- c) Please refer to Exhibit I, Tab 1, Schedule 10.
- d) Timelines to complete Distribution CIAs have not been affected by the volume of applications. Please refer to Exhibit I, Tab 1, Schedule 11 and Exhibit I, Tab 1, Schedule 12 with regards to the SIA and Tx CIA respectively.

**Ontario Power Authority INTERROGATORY #2 List 1**

**Interrogatory**

**Reference: C1, Tab 1, Schedule 1, page 1-2**

*However, the IESO's Market Rules require that large generator connection applications must also undergo a System Impact Assessment ("SIA") by the IESO and a Transmission Customer Impact Assessment by Hydro One Transmission. Ontario Regulation 326/09 made under the Electricity Act 1998 stipulates up to 150 days to accommodate these studies.*

- a) How many applications for connection of large generation projects were received since the start of RESOP and prior to the launch of the FIT program?
- b) For each of the projects listed in question 2 a), above, please provide the following information:
- The date the Distributor requested the SIA from IESO;
  - The date the Distributor notified Hydro One that a Transmission CIA was required;
  - The date IESO forwarded the completed SIA to the Distributor
  - The date the completed SIA was received by Hydro One Transmission
  - The date the completed Transmission CIA was forwarded to the Distributor

**Response**

- a) Between the start of the RESOP program, November 22, 2006, and the launch of the FIT program, Hydro One Transmission received four applications for CIA's from large distribution connected generators, that is, those with a capacity of greater than 10 MW.
- b) Unfortunately, not all of the requested dates are available. Only the date that the CIA agreement was executed and the date of the final report are available. These approximate the study start and finish dates.

	<b>Date of CIA Agreement</b>	<b>Date of Final Report</b>
1	December 27, 2007	December 10, 2008
2	March 10, 2008	September 22, 2008
3	June 28, 2007	November 5, 2007
4	unknown	September 8, 2008

**Ontario Power Authority INTERROGATORY #3 List 1**

**Interrogatory**

**Reference: Distribution System Code s. 6.2.14A**

*The distributor shall, within 10 days of initiating a connection impact assessment study, advise in writing any transmitter or distributor whose transmission or distribution system is directly connected to the specific feeder or substation to which the proposed embedded generation facility is proposing to connect. The distributor shall include in the written communication, at a minimum, the proposed in-service date, the rated capacity and type of technology of the proposed embedded generation facility. If the distributor requires a transmitter or host distributor to complete a TS review study or connection impact assessment, the distributor shall file an application with the transmitter or host distributor for such. A distributor will also inform the transmitter or distributor in writing on an ongoing basis of any change in status of the project including removing the capacity allocation for the project, material changes in the projected in-service date of the project or placing the project in service.*

**Reference: C1, Tab 1, Schedule 1, page 3**

*Hydro One's experience is that the steps in this phase are sequential, that is, that the IESO cannot begin the SIA until it receives the distribution CIA and similarly, that a prerequisite for beginning the Transmission Customer Impact Assessment is the receipt of the prior two reviews.*

- a) Please outline the information provided in the distribution CIA that is required to complete the IESO SIA.
- b) Of the information provided in question 3 a) above, how much of this information is required prior to the commencement of the IESO SIA?
- c) Please outline the information provided in the IESO SIA that is required to complete the Transmission CIA.
- d) Of the information provided in question 3 c) above, how much of this information is required prior to the commencement of the Transmission CIA?
- e) Of the information provided in questions 3 b) and d) above, how much, if any, of this information is available through other sources?

**Response**

- a) The IESO does not have any specific knowledge about the topology of the distribution grid. Therefore, in order to properly perform its SIA study and avoid, to the extent possible, overburdening the generator with excessive requirements, the IESO needs the following information from the distribution CIA:
1. the generator's technical information, including the generator's equivalent representation on the low voltage bus of the transmission connection facility;
  2. the intended mode of operation for the generator, including permissive reactive capability usage and impact on under frequency load shedding ('UFLS');
  3. the list of distribution connection requirements; and
  4. Significant protection changes required at the distribution level.
- b) All but #4 above is required prior to the commencement of the IESO SIA.
- c) To complete the transmission CIA, Hydro One Transmission needs the list of requirements and models from the IESO SIA study so that it may take these into consideration when it conducts its study. In addition, Hydro One Transmission obtains models that IESO prepares for their study to ensure that both parties are using consistent modeling data for the project under consideration.
- d) All the information from (c) above is required prior to commencement of the transmission CIA.
- e) None of the information in (b) and (d) above is available from other sources.

**Ontario Power Authority INTERROGATORY #4 List 1**

**Interrogatory**

**Reference: C1, Tab 1, Schedule 1, page 7**

*Upon receipt of payment from the generator, the transmitter then prepares a detailed scope of work and cost estimate for the required transmission upgrades and returns this to the distributor. The distributor compiles the total costs of all distribution and transmission upgrades and completes the offer to connect. Diagram 3, below, displays Hydro One's proposed timeline.*

With reference to Diagram 3, where both transmission and distribution upgrades are needed, how many months are acceptable to Hydro One as a deadline for the generator to execute the CCA following the Capacity Allocation Confirmation?

**Response**

At this time, Hydro One is unable to define an acceptable deadline for the execution of a CCA when both transmission and distribution upgrades are needed. The reason is that the work required to complete the activities associated with transmission cost estimates is complex and variable, based on project-specific factors.

During the development of the transmission portion of the cost estimate, a detailed scope of work first must also be developed, which may require the examination of several alternatives. Once the detailed scope of work is finalized, a release quality cost estimate must be prepared. Overall, the preparation of both the detailed scope of work and the release quality cost estimate require significant levels of effort to maximize the probability of a successful project. The processes for both take into account project-specific characteristics, and the time required can vary, accordingly.

**Ontario Power Authority INTERROGATORY #5 List 1**

**Interrogatory**

**Reference: Distribution System Code s. 6.2.16**

*In the case of an application for the connection of a mid-sized or large embedded generation facility, once the impact assessment is provided to the applicant, the distributor and the applicant have entered into an agreement on the scope of the project and the applicant has paid the distributor for the cost of preparing a detailed cost estimate of the proposed connection, the distributor shall provide the applicant with a detailed cost estimate and an offer to connect by the later of 90 days after the receipt of payment from the applicant and 30 days after the receipt of comments from a transmitter or distributor that has been advised under section 6.2.17. (Emphasis added)*

**Reference: Distribution System Code s. 6.2.4.1e**

*an applicant shall have its capacity allocation removed if:*

*(i) a connection cost agreement has not been signed in relation to the connection of the embedded generation facility within 6 months of the date on which the applicant received a capacity allocation for the proposed embedded generation facility;*

- a) What has been Hydro One's experience in reconciling the provisions of the Distribution System Code as outlined above in sections 6.2.16 and 6.2.4.1e?
- b) For each of the projects where there may have been challenges reconciling the provision noted in question 5 a), above, please provide the following information:
- The date that payment for a detailed cost estimate was received from the applicant (please request this information from the distributor if it is not readily available)
  - The date that the distributor requested a detailed cost estimate from Hydro One Transmission
  - The date that the detailed cost estimate was provided by Hydro One Transmission.
- c) Please outline the information provided in the distribution connection cost assessment that is required to complete the Transmission cost estimate.



1 **Response**

2  
3 a) Hydro One has not yet had the experience of reconciling the provisions of DSC  
4 sections 6.2.4.1e and 6.2.16. At this time, the six-month period referred to in DSC s.  
5 6.2.4.1e has not expired for any large embedded generation projects to which Hydro  
6 One Distribution has allocated capacity. This portion of the Application is not based  
7 on experience, but rather on a proactive approach in anticipation of the problems  
8 noted within.

9  
10 b) Please refer to Part a) above.

11  
12 c) Hydro One assumes that the “connection cost assessment” referred to in the question  
13 should, in fact, read “connection cost agreement” (“CCA”). No information that is  
14 provided in the distribution CCA is required to complete the Transmission cost  
15 estimate.  
16

**Ontario Power Authority INTERROGATORY #6 List 1**

**Interrogatory**

**Reference: C1, Tab 1, Schedule 1, page 8**

*6.2.4.1c, which states that the CIA will not be considered complete unless the in service date for the generation facility is within three years (for non-water power projects) after the initial application date or in accordance with the timelines in an executed OPA contract. This acknowledges that the additional time required to complete the SIA, Transmission Customer Impact Assessment and the relevant cost estimates will encroach on the generation facility's construction phase and possibly jeopardize the originally contracted in-service dates. (The proponent may also have to re-negotiate the original in-service date in their contract with the OPA.)*

- a) Is Hydro One proposing that its proposed exemptions should apply to all projects that currently have a FIT contract on a retroactive basis?
- b) Or is it proposed that these exemptions should apply on a prospective basis, thus allowing future generators to take the extended timelines into consideration at the time the application is made to the FIT program?
- c) Or is it proposed that these exemptions apply both retroactively and prospectively?

**Response**

- a) Please see the response to c) below.
- b) Please see the response to c) below.
- c) Hydro One believes that to be equitable, this exemption should be applicable to all large generation proponents who may unfairly face losing their capacity allocation under the current requirements of the Distribution System Code. This may require both retroactive and prospective application.

**Ontario Power Authority INTERROGATORY #7 List 1**

**Interrogatory**

**Reference: C1, Tab 1, Schedule 1, page 8**

*6.2.4.1c, which states that the CIA will not be considered complete unless the in service date for the generation facility is within three years (for non-water power projects) after the initial application date or in accordance with the timelines in an executed OPA contract. This acknowledges that the additional time required to complete the SIA, Transmission Customer Impact Assessment and the relevant cost estimates will encroach on the generation facility's construction phase and possibly jeopardize the originally contracted in-service dates. (The proponent may also have to re-negotiate the original in service date in their contract with the OPA.)*

- a) Is Hydro One proposing that all distributors in Ontario would be eligible for its proposed exemptions from the Distribution System Code? If not, why not?
- b) Did Hydro One consider seeking an amendment to the Distribution System Code rather than an amendment to its license?

**Response**

- a) Hydro One can request an exemption from its own licence only. It would support the Board, however, should the Board decide, upon review of this Application to initiate a review resulting in a decision with broader application to all distributors, provided that, until such a decision is rendered, the Board grants Hydro One the substantive relief requested by Hydro One, or interim relief granting the same substantive benefits.
- b) While the issue identified in Hydro One's application is time-sensitive, timelines associated with proposed Code amendments and their associated consultations can be lengthy, Hydro One believes that this matter must be dealt with in an expedited manner and has thus applied for a licence exemption.

In Hydro One's view, this application does not preclude subsequent Code amendments. Should the Board decide to open a consultation process on this issue, Hydro One would be an active and willingly participant. At this time, however, Hydro One believes that an exemption application of this nature is the most effective mechanism to address these issues.