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June 21, 2018

Delivered by Email, RESS & Courier

Ms. Kirsten Walli
Board Secretary
Ontario Energy Board
2300 Yonge Street
Suite 2701
Toronto, ON M4P 1E4

Dear Ms. Walli:

Re: Hydro One Networks Inc.
Application for Leave to Construct – EB-2018-0098
Response to Interrogatories of Atlantic Power Corporation ("Atlantic Power")

Pursuant to Procedural Order No. 2, please find enclosed Atlantic Power's response to interrogatories on the Atlantic Power evidence.

While reviewing materials on RESS in preparation of these interrogatory responses, Atlantic Power also identified a letter from Hydro One dated June 13, 2018 that was filed with the OEB. The letter is argumentative in nature. Setting aside matters of argument – the letter was never served on Atlantic Power or its counsel. This is in direct contradiction to the Board's letter dated May 3, 2018 which clearly states "[a]ll parties must serve materials filed with the OEB on Atlantic Power Corporation." Finally, the letter indicates Hydro One's intent not to reveal its views on the Atlantic Power evidence until reply submissions.

This is neither fair nor reasonable. At the request of the Board, Atlantic Power has undergone no small effort or expense to prepare and file evidence and interrogatory responses. Atlantic Power deserves the right to hear and respond fully to any and all critiques of its evidence. The Applicant should not be given the opportunity to hold back its position until reply.

For this reason, Atlantic Power submits that the Board should amend the dates set out in Procedural Order No. 2 in the following manner:

- The Applicant will file written argument-in-chief (inclusive of their views on the Atlantic Power evidence) by June 28, 2018.

- Intervenors (other than Atlantic Power) and OEB staff will file their final written submissions by July 5, 2018.

- Atlantic Power will file their final written submissions by July 12, 2018.

- The Applicant will file its written reply to intervenor and OEB staff final submissions by July 19, 2018.

Yours very truly,

BORDEN LADNER GERVAIS LLP

Per:

Original signed by John A.D. Vellone

John A.D. Vellone

cc: Applicant and Intervenors of record in EB-2018-0098
Joseph Cleary, Atlantic Power Corporation
Jarvis Coffin, Atlantic Power Corporation

Atlantic Power Corporation

EB-2018-0098

Responses to Interrogatories

Exhibit K

Filed: June 21, 2018

ATLANTIC POWER CORPORATION ("ATLANTIC POWER" / "APC") INTERROGATORY RESPONSES

Staff-1

Atlantic Power Facilities

Reference: Paragraphs 4-6, pages 2-3

Preamble:

At paragraphs 4 to 6 APC states in its evidence:

> Atlantic Power is seeking a fair and objective analysis of whether either or both plants could operate in the future in a manner which would enable H9K to stay within its power flow limits when circuit L21S is out of service and the system load is high, which would have the effect of eliminating the need for the transmission upgrade project proposed by Hydro One.
>
> To-date this analysis has not been undertaken. To do this analysis properly, Atlantic Power proposes that the OEB deny the requested leave to construct pending the completion of evidence that Hydro One and the IESO engaged in a transparent, iterative and fair cycle of discussions with Atlantic Power to identify technical system needs, to identify options to utilize existing facilities to meet those needs, and finally to properly cost those options and compare them to the proposed facility upgrades on an apples-to apples basis.
>
> Atlantic Power is willing to entertain a mutually agreeable short-term contract, if one is required, to ensure the provision of continued services from either the Calstock GS, the Kapuskasing GS, or both (as needed) past June 2020 to ensure that system needs continue to be met. Such a short-term arrangement would alleviate the schedule pressure that is currently driving Hydro One to seek an expedited response from the OEB, and would allow for a more fulsome consideration of all of the alternatives / options, which in Atlantic Power's view, is in the public interest.

Questions:

a) Please provide a summary of the options APC is proposing.

b) What is the length of the contract that APC is proposing, E.g. 1, 2, 5, years, for each of the options identified in a)?

c) With respect to the short term contract proposed by APC, would the terms of conditions and cost be equivalent? Does APC consider this arrangement to be more cost effective in the short term than Hydro One's LTC Kapuskasing reinforcement? Please explain?

Response:

a) APC is proposing that it work together with the IESO and Hydro One to conduct an iterative evaluation based on a range of scenarios both at the system level and the power plant level.

For this evaluation, APC would identify power plant capabilities and flexibility. The IESO and Hydro One are needed for system level scenarios.

For the system level, APC is proposing that the options consist of a range of parameters for each major system variable with two constant assumptions: that L21S has tripped and that system load is high.

System parameters would include whether H9K is operating at its normal rating, Long Term Emergency rating, or Short Term Emergency rating (and what those ratings are), as well as whether the power plants are assumed to be off-line, on-line based on the day ahead or real time market conditions, or proactively dispatched to respond to a system condition.

At the power plant level, APC has noted that a transparent, iterative and fair cycle of discussions would be useful to develop appropriate options.

Hydro One and IESO have not provided evidence that supports any particular level of operability that is required to meet local system needs. In particular, it does not demonstrate what specific requirements of quick starts and rapid ramping are essential and required operational characteristics.

Given this uncertainty, an initial list of possibilities includes:

Power Plant Option 1: Operate H9K up to its Long Term or Short Term Rating when L21S is out of service and system load is high until Calstock GS or Kapuskasing GS starts up. No significant changes to either plant.

Power Plant Option 2: Same as 1, but install a quick start (<10 min) natural gas fired reciprocating engine at either site (MW size determined by system study) to meet system needs until Calstock GS or Kapuskasing GS starts up. The new generator would also provide black start capability to each site providing additional value to the system.

Power Plant Option 3: Same as 2, but install a battery instead of a reciprocating engine. The battery would also provide regulation services providing additional value to the system.

Power Plant Option 4: Same as 1, but dispatch either plant during times when L21S may be at risk of tripping (e.g. storms) and system load is high.

Power Plant Options 5, 6, and 7: Minor, moderate, and major modifications to one or both plants to reduce start up times by varying amounts. For example, Kapuskasing GS could be converted from combined cycle to simple cycle which would reduce ramping limits based on temperatures of thick-walled steam components. The conversion to simple cycle could also reduce the exhaust volume thereby reducing purge times prior to start. Calstock could use intermittent gas firing to maintain drum pressure during short term shutdowns to reduce the restart time. Calstock could also modify its operation to use gas-firing only to reach a minimum load level, postponing the transition to wood until later in the start up to reduce start times.

To date this evaluation has not been completed, and none of these options have been fully explored.

b) APC is open to discuss different contract term options, depending on the system need and the level of incremental investment (if any) required to be made by APC. Obviously, the greater the capital investment, longer terms allow more time to amortize costs keeping annual costs lower.

c) The short-term contract proposed by APC was envisioned to be very short, e.g. 3 months or 6 months. The intent was to assure the OEB that there is sufficient time to complete a thorough analysis and alleviate the schedule pressure that is currently driving Hydro One to seek an expedited response.

APC considers this approach to be more prudent than approving Hydro One's LTC – given the evidence that viable cost-effective alternatives to the reinforcement project have, to-date, been ignored.

APC is open to discussions with the IESO or Hydro One on the terms and conditions of those contracts, depending on system need and facility capability. APC cannot provide an estimate of the costs of such a short term contract until it better understands these needs.

Staff-2

Atlantic Power Concerns

Reference: Paragraphs 7-8, pages 3-4.

Preamble:

At paragraph 7, APC refers to Hydro One's response to OEB staff Interrogatory 3(a):

> *"To respond to this interrogatory, the IESO completed additional analysis, and the estimated the cost on a NPV basis for a 5-year contract is more than $36 million. This is because the fixed costs associated with re-configuring the existing facilities to become quick start, including existing asset overhaul and/or replacement, would still have to be recovered, just over a shorter period of time."*

Then, at Paragraph 8, APC states:

> The estimated NPV of $36 million substantially overstates the costs of utilizing Atlantic Power's existing facilities to meet the local system needs. Hydro One has not provided the models used to arrive at this estimate, nor have they provided detailed evidence to support all the assumptions made in those models. Hydro One, however, has stated that it assumes "existing asset overhaul and/or replacement". As shown in Appendix "A" and "B", Atlantic Power's existing assets have a lengthy remaining useful life. Atlantic Power has not requested deregistration from IESO for its Kapuskasing plant, and there is no basis for Hydro One to assume either Kapuskasing or Calstock would be deregistered at the end of its OEFC contract term. An existing asset overhaul and/or replacement is not a reasonable assumption in these factual circumstances. Atlantic Power would be willing to enter into negotiations with the IESO and/or Hydro One to better quantify the actual comparable costs (if any) of utilizing Atlantic Power's existing facilities to meet local system needs. This option has not, to-date, been explored by the IESO or Hydro One.

Questions:

Please provide APC's estimate of the costs for a 5 year contract including all the assumptions, calculations and factors that that should be taken into account. The analysis should be presented in a tabular format that would allow ease of comparison to the Hydro One/IESO cost calculations. If APC considers some or all of such a detailed analysis to be confidential it may file its responses in accordance with the OEB's Practice Direction on Confidential Filing Requirements.

Response:

The following table is an illustrative example using publicly available information of the value of using one of APC's power plants in lieu of upgrading H9K over a 5 year period. Rather than divulge confidential basis the analysis shows the value that could be paid to APC while still resulting in no net cost to ratepayers compared to the H9K upgrade project. In essence, it is a breakeven analysis for ratepayer benefits.

APC has clearly stated the basis of the different assumptions it has made for the purposes of this analysis. Under these assumptions, ratepayers breakeven if the annual contract price with Calstock is equal to $19.191M. To the extent the annual payments to Calstock are less than the breakeven point, ratepayers are better off over the 5-year period.

While discussions can be had over each of the assumptions, the point APC is making is that there is no evidence that this type of analysis has been done in consideration of the Calstock and Kapuskasing facilities.

Example Breakeven Analysis From Ratepayer Perspective for a 30MW Generation Solution Instead of Transmission

	Calstock	Assumption	Basis of Assumption
Capacity (MW)		30	
Annual Capacity Value ($)	4,051,500	$370/MWDay	2016 Demand Response Value in Northeast
Annual Energy (MWhs)		100,000	About 66% of current annual production.
Annual Energy Value to Ratepayers ($)	12,500,000	$125/MWh	Approx. average cost of energy arising from the most recent renewables procurment (the LRP I RFP).
Annual Ancillary Services Value ($)	1,000,000		Estimate
Annual Disposal of Bark Legacy Piles for MNRF ($)	1,000,000		Estimate
Annual Value to Local Communities ($)	?		
Annualized Value of Deferring Upgrade by 5 Years ($)	540,000	1/2 of IESO's 10 year value since the H9K upgrade would be advanced only 5 years. Annualized.	Exhibit B-03-01 IESO estimates an NPV of $5.4 million assuming the H9K upgrade is advanced 10 years.
Annual Net Value to Ratepayers ($)	19,191,530		

Sources:

http://www.ieso.ca/corporate-ieso/media/news-releases/2016/03/ieso-announces-results-of-competitive-bids-for-large-renewable-projects

http://reports.ieso.ca/public/DR-PostAuctionSummary/PUB_DR-PostAuctionSummary_2016.xml

Staff-3

Atlantic Power Concerns

Reference: Paragraphs 9-10, page 4.

Preamble:

At paragraph 9, APC refers to Hydro One's response to OEB staff Interrogatory 3(a):

> "*To meet the local area reliability need, it is also possible to continue to operate the existing generators as they are operated today (i.e. not reconfiguring the existing facilities to become quick start). However, if the units are not reconfigured to have a faster start up time, the units will have to run as baseload generators to ensure they are available when needed, which would result in high energy costs. The IESO estimates that extending the contract with the existing facilities without reconfiguring the facility to become quick start, and assuming baseload generation of 10MW for a 5 year term, would still cost more than $35 million.*"

Then, at Paragraph 10, APC states:

> The estimated NPV of "more than $35 million" substantially overstates the costs of utilizing Atlantic Power's existing facilities to meet the local system need. With regards to Atlantic Power's existing facilities, it is not true that they will "have to run as baseload generators to ensure they are available when needed". As described in Appendix "A", the Calstock GS shuts down on most weekends – and does not run baseloaded at all hours. In addition, Atlantic Power has a degree of operational flexibility that could be utilized to meet system needs with one or both of its existing facilities that has not been accounted for in this analysis. In addition, Atlantic Power could implement targeted incremental changes to one or both facilities that would cost considerably less than a complete asset overhaul or replacement, that would further increase operational flexibility. None of these alternatives have been accounted for in the IESO/Hydro One's analysis.

Questions:

a) What is the cost of modifying the facilities for quick start capabilities?

b) Please provide APC's estimate of the costs including all the assumptions, calculations and factors that APC believes should be taken into account for the scenario described in paragraph 8 of APC's evidence. The analysis should be presented in a tabular format that would allow ease of comparison to the Hydro One/IESO cost calculations. If APC considers some or all of such a detailed analysis to be confidential it may file its responses in accordance with the OEB's Practice Direction on Confidential Filing Requirements.

Response:

a) As per APC's response to Staff-1, it is unknown what level of "quickness" would be adequate for quick start. Consequently, APC cannot provide these cost estimates until it better understands the required system parameters.

Likewise, there are numerous means of achieving responsiveness: conversion to simple cycle, adding a small quick start reciprocating engine, adding a battery, etc. Which means is most appropriate, and most cost effective, again depends on the actual system needs as outlined in response to Staff-1.

b) As explained in response to Staff-1, neither the IESO nor Hydro One have given APC sufficient information to prepare the requested cost estimate. APC is at a severe informational disadvantage in this regard.

To prepare the requested estimates APC would require evidence on whether H9K is operating at its normal rating, Long Term Emergency rating, or Short Term Emergency rating (and what those ratings are), as well as whether the power plants are assumed to be off-line, on-line based on the day ahead or real time market conditions, or proactively dispatched to respond to a system condition. APC would also require evidence of the level of operability that is required to meet local system needs. In particular, it does not demonstrate what (if any) specific requirements of quick starts and rapid ramping are essential and required operational characteristics.

With these limitations, APC has attempted to create an illustrative example of its proposed calculation methodology in response to Staff-2, which draws from the methodology proposed in APC's evidence.

Staff-4

Atlantic Power Concerns

Reference: Paragraph 19, pages 6-7.

Preamble:

At paragraph 19, APC states:

> Hydro One's evidence does not explain why the entire cost of a contracted facility would be attributed to meeting local reliability needs given the generation facility would also provide:
>
> a. Capacity (capacity has an intrinsic value separate from meeting local reliability needs - for example capacity is currently valued by the IESO at $200/MW-day in the Northeast Region based on the May 10, 2018 IESO demand response auction results)
>
> b. Energy (energy has an intrinsic value separate from meeting local reliability needs, as determined by the Hourly Ontario Electricity Price); and
>
> c. Ancillary services (such as VAR support, which has a value separate from meeting local reliability needs) - in fact the IESO has established market values for some ancillary services with market development underway for other ancillary services.
>
> For an apples-to-apples comparison to take place, the value attributable to capacity, energy and all existing and expected ancillary services that are supplied by a generation facility over the term of evaluation need to be deducted when comparing against a transmission upgrade project that provides none of these additional valuable services.

Questions:

a) Please provide the rationale for why the Capacity, Energy, Ancillary Services factors (3 Factors) should be considered in the cost benefit analysis of all the options that Hydro One/IESO has considered and those in APC's responses to OEB staff's interrogatories here. Is your rationale affected by whether there is a system need for energy, capacity, or ancillary services?

b) Please provide examples of where and how the 3 Factors have been included in other similar projects when evaluating generation options versus transmission system reinforcement type options?

c) To APC's knowledge have the 3 Factors been included in other regulatory jurisdictions when evaluating similar projects?

d) Please illustrate the impact of the 3 Factors on the costs derived by APC in response to interrogatories 2 and 3.

e) How would APC propose to verify the quantitative dollar benefits of the 3 Factors to ensure the benefits they provide are not over stated?

<u>Response:</u>

a) Capacity, energy and ancillary services are each recognized value-added services in Ontario's electricity market. IESO has and will in the future, as outlined in the LTEP, be "acquiring" these on behalf of ratepayers. These types of acquisitions have, in the past, undergone the full value assessments including the impact across the system over the planning horizon. Based on the results of these assessments the acquisitions were made to ensure the ratepayer obtained the full value.

These services are in addition to the value that would be provided by the proposed transmission upgrade – which provides one benefit – increased reliability for customers in the relevant geographic area. It is worth noting that "increased reliability" will not mean 100% reliability. Customers will still face some risk of outages even after the H9K upgrade.

In addition, the transmission upgrade project is itself useless without the support of the underlying electricity marketplace for capacity, energy and ancillary services. Customers' value and pay for each of these different market services as part of their bundled commodity electricity rates, <u>in addition</u> to the costs they pay for transmission and distribution.

Taken together, APC's proposition is if ratepayers can obtain increased reliability, and incremental capacity, energy and ancillary services at a lower total cost from one or both of the APC facilities – then ratepayers are better off rejecting the transmission upgrade project.

By way of example, the IESO is actively procuring capacity services in the Kapuskasing area (the Northeast region) through its demand response auction process. This demonstrates that the IESO has identified both a need for capacity in the region, and has ascribed a value to that capacity through its auction process.

By way of another example the OPA procured the York Energy Center facility through a full system assessment that accounted for the value of the capacity, energy and other services for the system at large and for local needs as well as the avoided cost of transmission for the local area. There may have been less costly generation alternatives perhaps in southwestern Ontario, closer to gas services, but the overall system costs were deemed to be lower by contracting the facility specifically located in the York region.

By way of another example, the IESO completed a competitive procurement for new renewable energy resources through its LRP I RFP. This demonstrates that the IESO identified both a need for incremental renewable energy and a value for that renewable energy. Noting also that Calstock is superior to the resources selected in that RFP since it offers renewable energy and reliable dispatchable capacity.

Finally, over the medium to long-term evaluation period used by IESO (10-15 years) there unquestionably will be a need for new capacity, energy and ancillary services. There may be uncertainty about when exactly the need for new capacity may arise, but that can be addressed through different modelling scenarios.

b) The York Energy Centre is a good example of properly taking into account the capacity, energy, and ancillary services aspects when assessing the contracting of a generation facility instead of a transmission alternative.

The original assessment the OPA (as it then was) undertook in the initial stages of its assessment was to reinforce Northern York region transmission supply. Through the assessment process it was later identified that the transmission option could be avoided through the contracting of generation within the Northern York region. In addition, resource planners could also use local generation to meet needs for capacity and energy as well as meeting ramping requirements.

As part of its assessment, at Section 5.4 of the Northern York Region Electricity Supply Study the OPA compared the costs of building new local generation vs. the costs of building new system generation plus the costs of a transmission upgrade. This comparison ensured the added value of generation (capacity, energy and ancillary services) was properly accounted for in both scenarios - thus ensuring an "apples-to-apples" comparison. The IESO concluded that the key differences between the two options was the incremental fuel costs for local generation, on the one hand, versus the cost of the transmission upgrade, on the other.

For more information, see Northern York Region Electricity Supply Study (dated September 30, 2005) (EB-2005-0315) and related exhibits.

- https://www.oeb.ca/documents/cases/EB-2005-0315/report_300905.pdf
- https://www.oeb.ca/documents/cases/EB-2005-0315/

In this case (as opposed to the Northern York Region), Atlantic Power is not proposing to install net new local generation, but rather is proposing to better utilize existing generation resource(s). To the extent that these existing resources provide added value (capacity, energy, ancillary services) that otherwise need to be procured from another source in the transmission upgrade scenario - the local generation should be credited that value to ensure an apples-to-apples comparison with the proposed transmission upgrade.

c) APC does not have any such knowledge. Given the short timeframes provided in Procedural Order No. 3, APC did not have time to undertake extensive research on this topic. Consequently, this response should not indicate that no such precedents exist.

However, consistent with the OEB's vision to deliver value for all Ontario energy consumers, APC's proposal is simply a request to ensure that all value elements that would accrue to ratepayers are properly taken into account prior to making major decisions on behalf of those ratepayers.

d) See the response to Staff-2 and Staff-3.

e) APC is proposing to work directly with Hydro One and the IESO to model quantitative dollar benefits of the its specific generation options vs. the transmission upgrade option to ensure that they are fairly compared on an apples-to-apples basis.

Staff-5

Atlantic Power Concerns

Reference: Paragraphs 22-23, pages 7-8.

Preamble:

At paragraph 22, APC refers to Hydro One's response to OEB staff Interrogatory 5(d):

> "*When determining the costs of Option 3, the IESO considered two possible modes of operation for the re-contracted existing facility. The first was continuing the present mode of operation and the second was reconfiguring the existing facility and operating it as a quick start facility. The IESO leveraged third party cost estimates for new generation facilities and costs for similar IESO-contracted facilities in Ontario to perform this analysis. The cost of the latter was less expensive than the former but still substantially more expensive than Option 1.*"

Then, at Paragraph 23, APC states:

> The IESO and Hydro One have failed to consider reasonable alternatives that represent a sensible middle ground between these two extreme modes of operation. Rather than continue in the present mode operation, Atlantic Power would propose exploring the operational flexibility available at the two existing facilities that can be achieved without installing an entirely new generation facility, and without incurring a substantial number of costly upgrades.

Questions:

a) Please further describe the 'middle ground approach' APC proposes. What would be the cost of this option? Please provide an analysis including all the assumptions, calculations and factors that APC considers need to be taken into account to determine a cost for this 'middle ground approach'. The analysis should be presented in a tabular format that would allow ease of comparison to the Hydro One/IESO cost calculations. If APC considers some or all of such a detailed analysis to be confidential may file its responses in accordance with the OEB's Practice Direction on Confidential Filing Requirements.

Response:

a) The configuration described as "Power Plant Option 1" in Staff-1 is an example.
The Calstock power plant could continue to operate similar to its existing mode of operation with an expected reduction in hours on line of 30-50%. When it is on line, it

can continue to provide its grid support function. How often will it be off line when L21S trips? The IESO has not provided specifics, but presumably very infrequently. During those times, H9K could operate at its Long Term Rating until the plant starts up.

The economics of this scenario are addressed in Staff-2.

IESO-1

Reference: Exhibit J, Appendices A and B

Questions:

a) How long does it take for each of the Kapuskasing and Calstock facilities to start-up from shut down and reach its minimum load? Does this depend on how long the facility has been shut down? If so, please specify how this timing varies with how long the facility has been shut down. Please provide supporting documentation.

b) What are the forced-outage rates for each of Kapuskasing and Calstock? Considering forced and planned outages, what is the historic availability of these facilities? Please provide supporting documentation.

Response:

a) The Calstock GS and Kapuskasing GS operated for years under the terms of an OEFC agreement which did not incentivize rapid starts. Historic data reflects the OEFC contract conditions.

   Kapuskasing's startup time is approximately 12 minutes to synchronize and 8 additional minutes (20 total) to reach full load in simple cycle based on past operations.

   Calstock's startup time is approximately 5 hours to reach minimum load based on past operations.

   If IESO could identify a start time requirement or a range of start time requirements, APC can evaluate the units' capabilities and assess whether modifications are required and associated costs (if any).

   See also the response to Staff-1.

b) As per the evidence filed at Exhibit J, Appendix A at Section 1.5 - the availability of the Calstock facility over the most recent 3 years of operation was 96.8%. The planned outage rate is approximately 2% and the forced outage rate is approximately 1%.

As per the evidence filed at Exhibit J, Appendix B at Section 1.5 - the availability of the Kapuskasing facility over the most recent 3 years of operation was 96.3%. The planned outage rate is approximately 1.6% and the forced outage rate is approximately 2.1%, although in most years the forced outage rate is less than 1%.

These values are based on APC's records. IESO should be able to verify the information based on information that APC has previously provided directly to the IESO, since planned and forced outages are communicated through the IESO control center.

IESO-2

Reference: Exhibit J, page 4, paragraph 10 states:

> *In addition, Atlantic Power has a degree of operational flexibility that could be utilized to meet system needs with one or both of its existing facilities that has not been accounted for in this analysis.*

Question:

a) Please explain what is meant by this statement. What "degree of operational flexibility" is Atlantic Power referring to in the statement above?

Response:

a) Please refer to APC's response to Staff-1, which provides further details.

While historically APC's two power plants operated under the terms of an OEFC agreement which did not incentivize rapid starts, the equipment in place may be able to meet system needs depending on the operational parameters assumed.

In addition, APC's power plants can be augmented with quick start (<10 min) natural gas fired reciprocating engines or batteries to bridge the system needs until the power plant has started up, Kapuskasing GS could be converted from combined cycle to simple cycle. Calstock could implement a standby operating mode to intermittently fire gas to maintain drum pressure during short term shutdowns to reduce restart times. Calstock could also modify its startup sequence to delay the transition to wood fuel, shortening the time to minimum load.

IESO-3

Reference: Exhibit J, page 4, paragraph 10 states:

> *In addition, Atlantic Power could implement targeted incremental changes to one or both facilities that would cost considerably less than a complete asset overhaul or replacement, that would further increase operational flexibility.*

Question:

a) What "targeted incremental changes" could be implemented to each and/or both of the facilities to further increase operational flexibility? Please specify the service(s) that would be provided to increase operational flexibility and the associated costs.

Response:

a) APC's power plants can be augmented with quick start (<10 min) natural gas fired reciprocating engines or batteries to bridge the system needs until the power plant has started up. The plants would be able to provide black start capability and regulation services. Kapuskasing GS could be converted from combined cycle to simple cycle. Calstock could implement a standby operating mode to intermittently fire gas to maintain drum pressure during short term shutdowns to reduce restart times. Calstock could also modify its startup sequence to delay the transition to wood fuel, shortening the time to minimum load.