IN THE MATTER OF sections 70 and 78 of the *Ontario Energy Board Act 1998*, S.O.1998, c.15, (Schedule B);

AND IN THE MATTER OF a Board-initiated proceeding to designate an electricity transmitter to undertake development work for a new electricity transmission line between Northeast and Northwest Ontario: the East-West Tie Line.

WRITTEN SUBMISSION PERTAINING TO PHASE 2 OF THE EAST-WEST TIE LINE DESIGNATION PROCEEDING (EB-2011-0140)

NOACC – NOMA Intervenors: (The Northwestern Ontario Associated Chamber of Commerce (NOACC) and the Northwestern Ontario Municipal Association (NOMA), combined with City of Thunder Bay)

May 9, 2013

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1) PHASE 1 DECISION AND ORDER

In its Phase 1 Decision and Order, the Board stated the following at page 8 and 9:

- "The Board will not, at this time, articulate an assessment methodology to be applied to the decision criteria, nor will it ascribe any relative importance to the decision criteria through a weighting system."; and

- "…the Board is unwilling to remove the discretion and flexibility it may need in evaluating the application for designation. The Board will exercise its judgment for each criterion, with the assistance of the evidence presented and the submissions received from all parties."

The NOACC-NOMA Intervenors have no position as to which of the applicants should be chosen as the designated transmitter to carry out development work for the East-West Tie Line. The NOACC-NOMA Intervenors do wish to make submissions to the Board, however, with respect to the Board's determining of an appropriate assessment methodology to be applied to the decision criteria and to propose weights or relative importance to be assigned to the decision criteria.

2) RE-INVENTING THE WHEEL

Since the suspension of the Integrated Power System Plan, the electrical system requirements of the Northwest have in part been subject to many reports[1], studies[2], assessments[3], plans[4] and directives[5] as outlined in Schedule A attached. The Intervenors

[1] Northwestern Ontario Preparing For Change: Northwestern Ontario Economic Facilitator Report, Robert Rosehart, 2008 – page 40 to 42)
[2] Ambassador's Northwest "Mining in Northwestern Ontario: Opportunities and Challenges" dated September 27, 2012, pages 66-72.
[3] Ontario Power Generation's Request for Approval of a Reliability Must Run Agreement for the Thunder Bay Generating Station, EB-2013-0061, includes a Technical Assessment in relation to de-registering the Thunder Bay Generating Station beginning at page 73 of 98, section 4.

ask the Board to incorporate where practical the findings, conclusions and scenarios of the indicated reports into the assessment methodology for evaluating the applications for designation.

3) RELIABILITY OF DESIGN

North American Electric Reliability Corporation (NERC) Standards define "Reliability" as "the ability to meet the electricity needs of end-use customers, even when unexpected equipment failures or other factors reduce the amount of available electricity".

NERC Standards further break down Reliability into Adequacy and Security, where:

- "Adequacy" means "[t]he ability of the bulk power system to supply the aggregate electrical demand and energy requirements of the customers at all times, taking into account scheduled and reasonably expected unscheduled outages of system elements"; and

- "Security" means "[t]he ability of the bulk power system to withstand sudden disturbances such as electric short circuits or unanticipated loss of system elements from credible contingencies".

Therefore, in terms of NERC Standards, Reliability is a product of both Adequacy and Security.

[4] Ministry of Infrastructure and Ministry of Northern Development and Mines "Growth Plan for Northern Ontario 2011", sections 5.6, 7.3, 8.2 and 8.3.
[5] The Ministry of Energy Supply Mix Directive dated February 17, 2011

4) THE IMPORTANCE OF POWER SYSTEM SECURITY IN THE NORTHWEST REGION

There have been 60 forced outages on the existing East-West Tie Line between 2006 and 2011, approximately 12 per year. Over a quarter of these outage events have been double-circuit outages in which both existing East-West Tie circuits were forced out of service. These 60 forced outages are over and above electrical storm events (OPA Long Term Electricity Outlook for the Northwest and Context for the East-West Tie Expansion dated June 30, 2011 (page 12 of 21)).

The IESO Feasibility Study states at page 1, that "…double circuit contingencies will need to be respected at all times, rather than during high risk periods when electrical storms are in the area, as is currently the practice".

The NOACC-NOMA Intervenors ask that the Board appreciate that the power system in the Northwest Region is inherently unreliable. That is so for a variety of reasons:

- vast land area,
- sparse population and
    - resultant remoteness of loads,
    - low density of transmission infrastructure, and
    - long (100 to 300 km) radial circuits
- 60% of load is industrial as opposed to residential, and
- that 60% of the load serves fewer than 50 large industrial customers spread out over land mass that is something in the order of 15 to 20% of the land mass of the entire province of Ontario.

Whatever reliability the power system in the Northwest Region does have arises from the facts that:

- power used within the Region is from sources generation that is
    - indigenous to the Northwest Region, and

    - is relatively widely distributed;
- the indigenous generation is, principally, a combination of
    - hydraulic generation and
    - thermal generation that is both
        - dispatchable, and
        - an essential source of the dynamic harmony needed in the absence of a dense infrastructure network; and
- the transmission supply available through the existing East West Tie is supplementary, adding to the adequacy component of reliability of power in the Northwest Region

It is essential to appreciate the consequences of a lack of Reliability in the power system in the Northwest Region. Two examples help make the point:

A. The Economic Development Officer for Red Lake notes that the total cost to Goldcorp of a recent 37 hour power outage could reach nearly $6,000,000.00 (ETF Presentation to OMA Energy Committee March 26, 2013).

B. In a fault affecting a paper mill it needs to be understood that it not only shuts the paper machine down but that shutdown also results in as much as 6-18 hours of cleanup and restarting of the massive paper making machine with a commensurate loss in production the aggregates cost of which can be in the order of $1,000,000 in each and every instance, never to be recovered.

The examples noted above are, of course, large industry and the role of the NOACC-NOMA Intervenors in this designation proceeding is to represent small business and residential use. The correlation is simply that in the Northwest Region the very existence of NOACC and NOMA members depends largely, if not entirely, on the success of these fewer than 50 large industries.

Minimal disruption of the power system assuring minimal downstream impact is therefore essential to NOMA and NOACC members.

The Upgrade at issue in this Designation Proceeding is important to the Northwest Region as a strengthening of both the adequacy of available transmission supply and the security of that supply. The upgrade in the East West Tire will increase the robustness of the transmission supply to the power system in the Northwest Region; however, increased reliability in the transmission supply available through an enhanced East West Tie ought not to be seen as a replacement for other sources of reliability in the power system already in the Northwest Region, in particular, the dispatchable supply available in the thermal generators in Atikokan and Thunder Bay

With respect to selection of the a designated transmitter the concern of NOMA and NOACC members is that the Applicant whose plan, capacity to construct, maintain and operate the upgrade to the Tie most contribute to reliability be selected.

5) TECHNOLOGY

The Double-Circuit

The IESO Feasibility Study indicated that a double-circuit option has several benefits over a single-circuit option. The Board in its interrogatories to all applicants asks, in part, whether there are benefits of the double circuit line, other than:

- A higher level of reliability; and

- A higher level of operating security as described in the IESO feasibility study.

The IESO Feasibility Study also made several determinations, in relation to one-plus-one contingency at page 7, including:

- "With the East-West Tie reinforced with a new single-circuit line, it would therefore be necessary, immediately following a contingency or outage involving this new line, to re-prepare the system for the loss of one of the circuits on the remaining double-circuit line."

- "Since the loss of the new single-circuit line would leave only the existing double-circuit in-service over the affected section, the transfer capability of the East-West Tie would therefore be reduced to the present limit for a *single-circuit contingency* of 350MW."

- "Reinforcing the East-West Tie with a new double-circuit line would require no similar actions…"

In addition, the OPA's Long Term Electricity Outlook for the Northwest and Context for the East-West Expansion made similar determinations at page 20, including:

- "A single-circuit 230 kV line would likely have a similar cost to a double-circuit 230 kV line, but would have reduced operability during planned and forced outages.

> Therefore, the OPA believes that the double-circuit 230 kV line is preferred, but other options could be proposed to the extent that they meet the other project scope criteria…"

The NOACC-NOMA Intervenors submit that:

- Reliability should be given a favourable weighting, or alternatively, be afforded a high level of importance;
- The IESO feasibility study and the OPA's Outlook support of a double-circuit line as preferable, based on Reliability, when compared to a single-circuit option;
- These assertions must be considered, however, in relation to other decision criteria.

The NOACC-NOMA Intervenors ask that the Board consider the assumptions underlying the IESO and OPA analyses. We are not power system design specialists but assume that the IESO and OPA analysis is accurate in the event of a permanent line fault on a new circuit.

The NOACC-NOMA Intervenors propose that Reliability of each technology be assessed in relation to the foreseeable causes of permanent line faults on the East-West tie Line, including permanent line faults caused by tower failure or line failure. In turn it must be asked what the likely causes of tower or line failure are. The NOACC-NOMA Intervenors submit that principally they will be:

- weather events (e.g. high winds, heavy ice build up);
- sever impact; and
- failing structural integrity (i.e. age, poor maintenance, or design fault).

Consideration also needs to be given to the foreseeable causes of transient effects such as suppression of transmission during electrical storms.

While double-circuit design offers an enhanced level of security, it does so if the event is a fault in only one of the circuits or transmission suppression in only one of the circuits. The underlying question, however, is whether the likely causes a line fault, or transmission suppression, are likely to affect only one of the suggested double-circuits or both of them. In other words, are not both circuits in a double circuit equally susceptible to the underlying causes of weather events, sever impact or failing structural integrity?

Correspondingly, if the risks of a permanent line fault are weather events, sever impact or failing structural integrity then the location of the East West Tie upgrade in a corridor remote from the existing East-West Tie would seem a better safeguard than double-circuits.

Again, The NOACC-NOMA Intervenors do not claim any skill or ability to assess which applicant has the better proposal. We are, however, concerned that the issues be addressed in a balanced way. In this instance, therefore, the NOACC-NOMA Intervenors ask that the Board determine which of the proposed designs offers the most reliable option given the likely causes of a permanent line fault (weather events, sever impact or failing structural integrity), or causes of transmission suppression (electrical storms).

6) SCHEDULE

The Standard to be Met

Again, in terms of NERC Standards, Reliability is a product of both Adequacy and Security, where Adequacy means “[t]he ability of the bulk power system to supply the aggregate electrical demand and energy requirements of the customers at all times, taking into account scheduled and reasonably expected unscheduled outages of system elements”.

Deficiency in Present Power System Planning

The NOACC-NOMA Intervenors are concerned about what appears to be both a foreseeable lack of Reliability and a foreseeable lack of robustness in what appears to be the power system plan for the Northwest Region.

The concern relates to both the apparent supply mix itself as well as the needed in-service dates for both generating and transmission sources of power in the Northwest Region.

The Directive of the Minister of Energy to the OPA dated February 17, 2011 stated:

- "The Government's commitment to replace all coal-fired generation by the end of 2014 will be met".

The Directive of the Minister of Energy to the OPA dated August 17, 2011 stated:

- "Ontario's Long Term Energy Plan, released in November 2010, proposed converting two coal-fired units at the Ontario Power Generation ("OPG") Thunder Bay Generating Station to natural gas. These converted units are needed not only for the local supply to the city of Thunder Bay, but also for system reliability in Northwestern Ontario. Given the nature of the conversion, the Ministry of Energy recognizes the OPG's requirement for a long term energy supply contract in respect of the output from these units. As such, the Ministry has determined to pursue the initiative of negotiating and concluding such an Agreement."

In addition, the Ontario Long Term Energy Plan, released by the Ministry of Energy in 2010 states the following at page 20:

- "Coal-fired plants will cease to burn coal in 2014"; and

- "In line with the Growth Plan for Northern Ontario and future needs of the Ring of Fire, the province is replacing coal at Atikokan and Thunder Bay (Thunder Bay Generating Station) and re-powering these facilities with cleaner fuel sources."

However, as of today, approximately nineteen months away from the province's self imposed 2014 deadline for cessation of coal fired generation in the power supply system, the Thunder Bay Generating Station has not only not been converted to a cleaner fuel source but, given the time constraints in making such a conversion, cannot possibly be converted prior to the phase out of coal by the end of 2014.

The Atikokan Generating Station (AGS) is being converted to Biomass. However, its generating capacity will be restricted based on a contractual supply of biomass. Ontario Power Generation has stated that the AGS if run at maximum would be sustainable over only 4 days at a time for approximately 36 days.

The NOACC-NOMA Intervenors remain of the view that both the upgrade of the East-West Tie and the continued operation of the Thunder Bay Generating Station (TBGS) are essential to the reliability of the IESO Controlled Grid in the Northwest Region.

The importance of the TBGS and the East-West Tie expansion become increasingly evident given the recent publication titled "Advantage Northwest Mining Readiness Strategy" (the "Mining Readiness Strategy), commissioned by the City of Thunder Bay, Thunder Bay Community Economic Development Commission and the Fort William First Nation. The Mining Readiness Strategy states the following at pages 1 and 4:

- "The Northwestern Ontario region is forecasting globally significant growth in mineral exploration and mining development. This growth is expected to result in substantial economic and social development of Thunder Bay, its surrounding municipalities and First Nation communities. The discovery and development of major gold deposits, nickel and chromite in the "Ring of Fire" and other mineral

resources are expected to create a variety of business opportunities that positively influence the Region's economic outlook. This growth will place unique pressures on government services as well as the current, and future, mining labour market"; and

- "After the retirement of the coal-fired Thunder Bay Generating Station, the electricity system will rely on an inflexible generation mix plus interconnection to external generation with limited reliability. This could delay the development of mining activities until the commissioning of the East-West Tie is completed. This delay could extend beyond 2019 if construction of the East-West Tie is delayed as a consequence of time requirements for Environmental Assessment (and other permits) and the First Nation consultation process.

The upgrade to the East-West tie will provide improved reliability in that component of the supply mix for the Northwest Region which is generated externally. That improvement will not arise, however, until completion of the Tie upgrade.

The interim between January 1, 2015 and the commissioning of the East-West Tie upgrade will leave the power supply system for the Northwest Region in unacceptable jeopardy. The NOACC-NOMA Intervenors anticipate this jeopardy will arise because the need of enhanced power supply for the development of the mining sector is forecasted to mature before the in-service date of the expanded East-West Tie.

The delay in the development of the power system infrastructure required by the mine sites will introduce equivalent delay and potential cancellation or considerable downsizing of the proposed mining projects or reliance on diesel generation with all of the resulting environmental concerns.

The Relevance to This Designation Proceeding

The NOACC-NOMA Intervenors submit that:

- Schedule in relation to the in-service date of the EWT upgrade is of critical importance.

- Correspondingly, the capacity of the transmitter to be designated to design the East-West Tie expansion within the proposed schedule must be given a favourable weighting, or alternatively, a high level of importance.

- The Board in making its determination should give favourable weighting, or alternatively, a high level of importance to indicia of capacity to avoid delays. These indicia might include demonstrated:

    - success in completing transmission projects on time and within budget which projects have been,
        - of comparable size and complexity,
        - over comparable topography, and
        - using design suited to both the climate and remoteness that will characterize the upgrade in the East-West Tie,

    - inherent financial capacity to complete a project of this size, and

    - success in consultation with, and accommodation of, Potentially Affected Local Aboriginal and Metis Communities.

7) CONSULTATION

The NOACC-NOMA Intervenors submit that the Applicant to be awarded the status of Designated Transmitter must be able to demonstrate commitment to:

- transparent, fair and meaningful consultation with affected landowners, as well as local Aboriginal and Metis and municipal communities;

- participation for local Aboriginal and Metis and municipal communities that will be affected by the construction and operation the East West Tie;

- in both the short and the long term, timely resolution, of contentious issues immediately as they arise; and

- meaningful economic benefit to local Aboriginal and Metis and municipal communities during the design, construction and maintenance phases of the East-West Tie upgrade.

The NOACC-NOMA Intervenors submit that a favourable weighting, or alternatively, a high level of importance should be afforded in Applicants demonstrating such commitment.

8) BOARD STAFF SUBMISSION

The NOACC-NOMA Intervenors support the Board Staff's submission that the Board should:

- impose milestones on the designated transmitter for the development of the East-West Tie Line;

- require adherence to scheduled milestones and reporting of progress for the development of the East-West Tie Line;

- not adjust the schedule proposed by the designated transmitter in its application;

- allow applicants to re-file their respective development schedules to allow the dates in the schedule to be adjusted to recognise the actual date of the Board's designation decision;

- require quarterly reporting for the designated transmitter;

In addition, the NOACC-NOMA Intervenors support the Board Staff submission that the OPA include in its Phase 2 submission any update it can offer with respect to the need for the East West Tie Line expansion and specifics, where applicable, as to how it has come to that conclusion. However, the NOACC-NOMA Intervenors note that the March 29, 2011 letter from the Minister to the OEB, states that the EWT is required infrastructure for reliability and in the NW Region.

Finally, it is the position of the NOACC-NOMA Intervenors that the TBGS needs to be maintained in- service in order to ensure that there is sufficient dispatchable generation for the Reliability of the power system in the Northwest Region: however, the NOACC-NOMA Intervenors appreciate that that issue is not directly the subject of this proceeding.

IN THE MATTER OF sections 70 and 78 of the *Ontario Energy Board Act 1998*, S.O.1998, c.15, (Schedule B);

AND IN THE MATTER OF a Board-initiated proceeding to designate an electricity transmitter to undertake development work for a new electricity transmission line between Northeast and Northwest Ontario: the East-West Tie Line.

SCHEDULE A

To the Written Submissions Pertaining to Phase 2 of the East-West Tie Line Designation Proceeding (EB-2011-0140)

NOACC – NOMA Intervenors: (The Northwestern Ontario Associated Chamber of Commerce and the Northwestern Ontario Municipal Association, combined with City of Thunder Bay)

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1) A report by Robert Rosehart titled "Northwest Ontario: Preparing for Change" dated February 2008[6], states the following at page 40 of 42:

- "If the two coal-fired stations' capacity of 475 MW is withdrawn, the residual generating capacity is approximately 500 MWs. The end result will be a much greater need for the west system grid to import electricity from either Manitoba or Southern Ontario. This study heard that the current inflow/outflow limitations near Wawa will be corrected within the next two-to-three years, and that such an inflow/outflow should not be problematic. An ongoing public issue in the Northwest continues to be the provincial legislation requiring both coal-fired generating stations in Northwestern Ontario to cease burning coal by 2014. This is an area that needs further study with respect to the potential for replacement generating capacity in the Northwest, but clearly, if the current plans are implemented, the region will be left with much lower indigenous levels of generation"; and

- "It is recommended when the Ontario Power Authority creates its long-term plan, it considers developing sufficient indigenous power in the Northwest to replace the 2014 targeted reductions in the current system".

2) A report by the Ministry of Infrastructure titled "Growth Plan for Northern Ontario 2011[7], states the following:

a. in relation to Energy, section 5.6:

   i. 5.6.1 The Province, working with the Ontario Power Authority and licensed transmission and distribution companies, will identify investment opportunities in Northern Ontario's transmission and distribution systems to maintain reliability, meet new and growing demands, and accommodate *renewable energy* generation.

[6] Link to document: http://www.noacc.ca/uploads/documents/rosehart%20report%20feb%2008.pdf
[7] Link to document: https://www.placestogrow.ca/index.php?option=com_content&task=view&id=368&Itemid=65

ii. 5.6.2 The Province will work with Hydro One, the Ontario Power Authority, remote off-grid communities and the federal government to identify opportunities and assess the feasibility of long-term alternatives to diesel-generated power

iii. 5.6.3 The Province will work with the Ontario Power Authority and local distribution companies to seek opportunities to increase the efficiency of energy use in Northern Ontario communities.

b. in relation to Economic Development in Aboriginal Communities, section 7.3:

i. 7.3.1 The Province will work with Aboriginal communities and organizations to increase employment opportunities for Aboriginal peoples as part of the economic development strategies for *existing and emerging priority economic sectors*, as set out in Policies 2.2.1, 2.2.2, and 2.2.3.

ii. 7.3.2 Aboriginal communities will be involved in the development of *regional economic plans*, in accordance with the Policies in 4.5.

iii. 7.3.3 The Province will work with Aboriginal communities and organizations, the federal government, and others to expand opportunities for Aboriginal peoples to participate in local labour markets by:

1. increasing Ontario internships, work exchange and summer experience opportunities and awareness of these programs in Aboriginal communities

2. continuing to increase access to education, skills training and apprenticeship opportunities in rural and *remote communities*

3. working with Aboriginal communities to develop economic opportunities close to home while also working to provide supports for those people who relocate for training and education

4. encouraging partnerships among Aboriginal communities, postsecondary institutions, skills training providers and industry to respond to unique labour market needs.

iv. 7.3.4 The Province will support the capacity of Aboriginal communities and organizations to participate in economic development opportunities through:

1. training and support for Aboriginal economic development agencies

2. encouraging industry to continue to work with Aboriginal communities and organizations to advance local education, training and employment opportunities.

v. 7.3.5 The Province will work to develop new approaches and mechanisms to support Aboriginal enterprises, including:

1. provincial procurement procedures that emphasize support for Aboriginal businesses

2. alternative mechanisms (including working capital and micro-capital) for Aboriginal enterprises to attain collateral and equity positions

3. removing barriers to the eligibility of various forms of Aboriginal enterprises, including social enterprises and co-operatives, to provincial government programs

4. targeted promotion of provincial programs within Aboriginal communities.

vi. 7.3.6 The Province will work with the federal government and other partners to consider the needs of Aboriginal communities when identifying infrastructure investment priorities in accordance with the Policies in 5.2, 5.3, 5.4, 5.5 and 5.6.

c. in relation to Engaged and Informed Population, section 8.2:

i. 8.2.1 The Province will work to implement the policies of this Plan in a manner that is responsive to Northern Ontario through:

1. establishing a northern policy institute

2. seeking out the views and aspirations of Northern Ontario residents and businesses

3. using a variety of consultation mechanisms, in both English and French, such as regional public meetings and online consultation

4. including individuals and organizations that possess expertise related to Northern Ontario's strengths, needs, and opportunities, where appropriate, on technical working groups, public boards, agencies, and commissions.

ii. 8.2.2 The Minister of Infrastructure and the Minister of Northern Development, Mines and Forestry will involve northerners in the implementation of this Plan, and will provide information to build understanding of this Plan and facilitate informed involvement in the implementation of this Plan.

d. in relation to Co-ordinated and Collaborative Decision Making, section 8.3:

i. 8.3.1 A co-ordinated approach will be taken within the Province to implement this Plan.

ii. 8.3.2 Provincial ministries will work to implement the priorities and policies of this Plan in developing new programs or capital investments or when implementing existing programs or initiatives.

iii. 8.3.3 The Province will work collaboratively with other partners including the federal government, municipalities, Aboriginal communities and organizations, Francophone organizations, businesses, industry associations and community stakeholders to implement this Plan.

iv. 8.3.4 The Province will work with the federal government and municipalities to integrate regulatory and other approvals processes, where appropriate.

3) A report commissioned by Ambassador's Northwest titled "Mining in Northwestern Ontario: Opportunities and Challenges dated September 27, 2012[8], states the following at page 66 of 72:

a. "Three major issues and challenges facing the development of mining in this region are: (1) Aboriginal involvement, (2) labour market dynamics, and (3) infrastructure in terms of rail, roads, and electrical power"; and

b. "A major constraint in operating the nine mining projects is the requirement for over 550 MW of electrical power. Various industry stakeholders have suggested that surplus power capacity in excess of 500 MW exists within the current generating stations in Thunder Bay and Atikokan and that both these thermal generating stations would have to run at full capacity to meet the needs of the mining industry."

[8] http://www.thunderbay.ca/Assets/CEDC/docs/Mining+in+Northwestern+Ontario+-+opens+a+new+window.pdf

4) The Ministry of Energy Supply Mix Directive dated February 17, 2011[9] states the following:

a. "The OPA is to contract with OPG for biomass fuelled generation from the 215 MW Atikokan Generating Station, ideally to come online in 2013";

b. "The units at the Thunder Bay Generating Station are to be converted to natural gas";

c. "The IPSP must include the following five projects, which the OPA has already identified as being priorities to ensure system reliability, to serve new load and to accommodate renewable:

i. adding devices to enhance transfer capability in Southwestern Ontario;

ii. upgrading existing lines west of London;

iii. adding a new line west of London;

iv. adding a line to the existing east-west tie line along the short of Lake Superior; and

v. adding a new line to Pickle Lake."

5) Ontario Power Generation's Request for Approval of a Reliability Must Run Agreement for the Thunder Bay Generating Station[10], EB-2013-0061, includes a Technical Assessment in relation to de-registering the Thunder Bay Generating Station beginning at page 56 of 98. The Technical Assessment states the following at page 73, section 4:

a. "Under the current forecast, one Thunder Bay unit can be removed from service without having an unacceptable impact on the reliability of Northwest

[9] http://www.powerauthority.on.ca/sites/default/files/new_files/IPSP%20directive%2020110217.pdf

supply. Removing both Thunder Bay units from service is likely to leave the Northwest zone with inadequate supply, unless additional capacity support is made available in the area. The conversion of Atikokan to biomass makes the unit unavailable for the duration of the study period. When one autotransformer at Lakehead TS is out of service, reliance on the Lakehead area load rejection may be needed to prevent voltage collapse and equipment overloading in the Thunder Bay area, should the second autotransformer at Lakehead suffer an outage."

[10] http://www.rds.ontarioenergyboard.ca/webdrawer/webdrawer.dll/webdrawer/rec/385161/view/OPG_appl_RMR_TBGS_revised_20130227.PDF