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MAY 24 2011

ONTARIO ENERGY BOARD



BY COURIER

May 20, 2011

Ms. Kirsten Walli *24/5/11*  
Secretary  
Ontario Energy Board  
Suite 2700, 2300 Yonge St.,  
Toronto, ON M4P 1E4

Dear Ms. Walli:

EB-2010-0345 – Niagara West Transformation Corporation Transmission Revenue Requirement  
Application Response to Technical Conference Undertakings – Amendments

The response to the Technical Conference Undertakings was emailed on May 19, 2011.

Enclosed are two amendments to that email.

1. JT 1.4 Additional information regarding embedded generation, letter dated May 18, 2011 from Peter Wicks, VP Operations NWTC **referenced as JT 1.4 (a)** and letter dated April 11, 2011 to the LDC's Niagara Peninsula Energy Inc. and Grimsby Power, **referenced as JT 1.4(b)**.
2. JT 1.5 Complete copy of the Transmission Connection Agreement **referenced as JT 1.5(a)**.

Sincerely,

Karen Bubish,  
VP Administration  
NWTC

c. EB-2010-0345 Intervenor,  
Michael Millar, OEB  
Edik Zwarenstein, OEB



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JT. 4(a)

MAY 24 2011

May 18, 2011

ONTARIO ENERGY BD

RE NWTC UNDERTAKING N0.JT 1.4

Attached is a copy of a letter NWTC issued to it's two customer LDC's, namely NPEI and Grimsby Power, dated April 11, 2011.

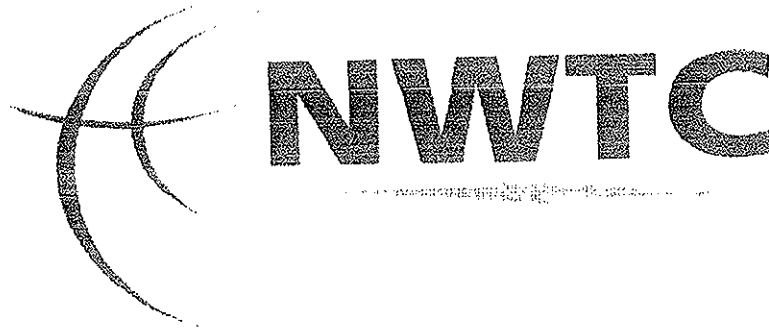
This letter confirms NWTC's inability to accommodate any embedded generation projects to it's 27.6kV system, both FIT and Micro FIT due to the fact the equipment is already operating at over 95% of it's interrupting capacity, without any embedded generation.

The equipment at NWTC substation at 27.6kV is GIS equipment, rated, design tested, CSA Approved and Hydro One Approved at 16kA IC, 3 phase fault level. This equipment is also Type 1 Arc Resistant switchgear design tested and approved at 16kA IC level.

The attached summary report issued to NWTC by Raven Engineering Inc confirms that the system IC 3 phase rating, without embedded generation is 15675 amps which is approx 98% of the rating of the equipment.

Peter Wicks  
V. P. Operations  
NWTC.

JT 104 (b)



APRIL 11, 2011

NIAGARA PENINSULA ENERGY INC.

GRIMSBY POWER.

RE FIT/MICRO FIT PROJECTS.

Gentlemen,

As a result of our meeting between Niagara Peninsula Energy, Grimsby Power and Niagara West Transformation Corporation on April 8, 2011 it was agreed that this letter will officially advise you that NWTC substation is currently at it's maximum interrupting capacity without connection from any embedded generation project.

On this basis NWTC is unable or willing to accommodate any embedded generation projects that are intended to be connected to your distribution system that originate from feeders out of NWTC substation.

Our substation is already being operated above 95% of the interrupting rating of the 27.6kV GIS.

The addition of any embedded generation both FIT and Micro Fit projects is likely to cause the interrupting rating of the equipment to exceed the existing fault level ratings.

NIAGARA WEST TRANSFORMATION CORPORATION  
231 Roberts Road, Ontario L3M 5N2

Such projects are therefore not recommended to be connected to NWTC substation unless they have official CIA approval or offer to connect approval from the LDC, prior to Dec 8, 2010.

P. T Wicks

A handwritten signature in black ink, appearing to read 'P. T. Wicks', with a horizontal line drawn underneath it.

V. P. Operations.

## Transmission Connection Agreement

This Connection Agreement is made this 9<sup>th</sup> day of February, 2004

**BETWEEN** HYDRO ONE NETWORKS INC., a corporation incorporated pursuant to the laws of the Province of Ontario, (the "Transmitter") and licensed by the Ontario Energy Board.

### PARTY OF THE FIRST PART;

and NIAGARA WEST TRANSFORMATION CORPORATION, a corporation incorporated pursuant to the laws of the Province of Ontario, (the "Customer")

### PARTY OF THE SECOND PART.

From time to time, the Transmitter and the Customer shall be individually referred to in this Agreement as "Party" and collectively as "Parties".

### RECITAL

In accordance with its licence and the Market Rules, the Transmitter has agreed to offer, and the Customer has agreed to accept Connection Service, on the terms and conditions of this Agreement.

### AGREEMENT

**NOW THEREFORE** in consideration of the foregoing, and of the mutual covenants, agreements, terms and conditions herein contained, the Parties, intending to be legally bound, hereby agree as follows:

## 1. DEFINITIONS

- 1.1. All defined terms that appear in this Connection Agreement that are not defined herein shall have the meanings ascribed thereto in the Transmission System Code ("the Code") issued by the Board in effect at the relevant time. All capitalized terms in the Connection Agreement shall have the same meaning as their non-capitalized counterparts as defined in the Transmission System Code;
- 1.2. "Cure Period" has the meaning defined in section 8.2 and in Schedule C of this Connection Agreement
- 1.3. "Default Notice" means a notice concerning an event of default delivered in accordance with the procedures set out in the connection agreement from one party to a Connection Agreement to the other party to that same Connection Agreement;
- 1.4. "Defaulting Party" means a Party to the Connection Agreement who has committed an act of default under the Code or the Connection Agreement
- 1.5. "End Cure Period Notice" has the meaning given in section 12.2 and Schedule C of this Connection Agreement;

- 1.6. "Event of Default" means either a financial or a non-financial default but does not include any default caused by, arising out of, or in any way connected to, an emergency;
- 1.7. "Export Transmission Service" has the meaning given in the transmission Rate Order in effect at the relevant time;
- 1.8. "Financial Default" means failure by either party to a Connection Agreement to pay any amount when due under that Agreement. It includes failure to pay compensation or indemnification for loss or damage agreed to by the parties, or for amounts determined to be owed to a party in accordance with the dispute resolution procedure outlined in section 13 of the Connection Agreement;
- 1.9. "Insolvency Event" means, with respect to the Customer, the occurrence of any one of the following;
  - 1.9.1. The winding up, dissolution, liquidation, or bankruptcy of the Customer, except as part of a bona fide corporate reorganization, unless its existence is immediately reinstated or a resolution to that effect is passed, or it makes a general assignment for the benefit of its creditors or a proposal under the Bankruptcy and Insolvency Act (Canada), as amended or re-enacted from time to time, or is adjudged bankrupt or insolvent; or if it proposes a compromise or an arrangement under the Companies' Creditors Arrangement Act, (Canada), as amended or re-enacted from time to time, or files any petition or answer seeking any reorganization, arrangement, composition, readjustment, liquidation, or similar relief for itself under any present or future law relating to bankruptcy, insolvency, or other relief for or against debtors generally;
  - 1.9.2. A court of competent jurisdiction enters an order, judgment or decree against the Customer seeking any reorganization, arrangement, composition, readjustment, liquidation, dissolution, winding up, termination of existence, declaration of bankruptcy or insolvency or similar relief under any present or future law relating to bankruptcy, insolvency or other relief for or against debtors generally, and such order, judgment or decree remains unvacated and unstayed for 60 days (whether or not consecutive) from the day of entry; or if any trustee in bankruptcy, receiver, receiver and manager, liquidator or any other officer with similar powers is appointed for the Customer with its consent or acquiescence and that appointment remains unvacated and unstayed for 60 days (whether or not consecutive); or
  - 1.9.3. The Customer becomes insolvent.
- 1.10. "Line Connection Service" has the meaning given in the transmission Rate Order in effect at the relevant time
- 1.11. "Network Rate" has the meaning given in the transmission Rate Order in effect at the relevant time;
- 1.12. "Network Service" has the meaning given in the transmission Rate Order in effect at the relevant time;
- 1.13. "non-defaulting Party" means a Party that is not a defaulting Party;
- 1.14. "non-financial Default" means the following:
  - 1.14.1. any breach of a term or condition of the Code or the Connection Agreement other than a financial default unless the breach occurs as a direct result of an emergency;
  - 1.14.2. a licensed Party's ceasing to hold a licence; and
  - 1.14.3. an Insolvency Event.

- 1.15. "Rate Schedule" means the rates in effect from time to time and the terms and conditions relating to those rates that are approved by the Board in the transmission Rate Order as payable by the Customer to the IMO in accordance with the Market Rules for the Transmission Services (as defined in the Market Rules). These Rate Schedules include a set for connection services;
- 1.16. "Transformation Connection Service" has the meaning given in the transmission Rate Schedule;
- 1.17. "Transmission Services" means the facilities services provided by a transmitter to a Customer in accordance with the transmission Rate Order in effect at the relevant time, and means any one or more of Network Service, Line Connection Service, Transformation Connection Service or such other Transmission Services as may be described in the transmission Rate Order in effect at the relevant time;
- 1.18. "Transmission Service Rate" or "Transmission Rate" means the rate paid by the Customer for the Transmission Services under the transmission Rate Order in effect at the relevant time;

## 2. PURPOSE OF AGREEMENT

This Agreement sets out the terms and conditions upon which the Transmitter has agreed to offer, and the Customer has agreed to accept connection service.

## 3. TRANSMISSION SYSTEM CODE

The Transmission System Code (the "Code") and this Agreement establish minimum testing, operational and maintenance standards for the Transmitter and the Customer. The Parties hereto hereby agree to be bound by, and to act at all times in accordance with the Code which is hereby incorporated in its entirety by reference into, and which hereby forms part of this Agreement.

## 4. CONFIDENTIALITY OF INFORMATION

- 4.1. For the purposes of this section Confidential Information means:

- (a) all information disclosed by a Party to the other Party under the Code or under this Agreement or in negotiating a Connection Agreement which by its nature is confidential to the Party disclosing the information; and

- (b) all interpretative reports or other data generated by a Party that are based in whole or in part on information that is made Confidential Information by clause (a).

- 4.2. "Confidential Information" does not include:

- (a) information that is in the public domain, provided that specific items of information shall not be considered to be in the public domain merely because more general information is in the public domain and provided that the information is not in the public domain as a result of a breach of confidence by the Party seeking to disclose the information or a person to whom it has disclosed the information;

- (b) information that is, at the time of the disclosure, in the possession of the recipient, provided that it was lawfully obtained either from the other Party or from sources, who did not acquire it directly or indirectly from the other Party under an obligation of confidence; and

- c) information that must be disclosed in compliance with a judicial or governmental order or other legal process.
- 4.3. The Transmitter and the Customer shall exchange all Information subject to the confidentiality terms and definitions set out in subsection 4.1 above. This exchange of Information is needed to maintain reliable operations of the transmission system, including but not limited to the Information listed in Appendix 3 of the Code, Schedules E and K of this Agreement, and subsection 4.6. below, subject to the terms of the Transmitter's Licence and the conditions set out below:
- 4.3.1. The Information shall at all times be treated as confidential, and shall be prepared, given, and used in good faith;
  - 4.3.2. Parties shall use the Information only for the requirements of the work being performed including, but not limited to, planning or operating the Parties' facilities, and not for any other purpose, and shall not disclose it to any third Party, directly or indirectly, without the prior written consent of the Party that provided the Information, and in such events the third Party must agree to use the Information solely for the requirements of the work as specified;
  - 4.3.3. Information shall not be used for any commercial purpose of any kind whatsoever other than contemplated herein.
- 4.4. The Parties shall make the Information available to each other in a timely and co-operative manner.
- 4.5. The Information disclosed by the Parties in accordance with this section shall only be used by the recipient of the Information for the requirement of the work being performed including, but not limited to, planning or operating the Parties' facilities and shall not be used for any other purpose or disclosed to a third Party. All Information disclosed hereunder shall be Confidential Information except as provided in subsection 4.2 above.
- 4.6. A Party, Party "A", shall indemnify and save harmless the other Party, Party "B", from and against any and all claims occasioned or suffered by Party "B" as a result of Party "A" disclosing any of the Information contrary to the provisions of this Agreement.
- 4.7. The Information shall include, but not be limited to, the types set out below:
- 4.7.1. equipment capacities and ratings;
  - 4.7.2. situations when equipment limits are being approached;
  - 4.7.3. changes in the configuration of each Party's facilities (either permanent or temporary) that may affect each Party's system security, load distribution, protective relay settings, and other parameters;
  - 4.7.4. details of defective equipment or hazardous conditions that may become known to one controlling authority but not to the other;
  - 4.7.5. the date and time at which the Customer's facility was connected to or disconnected from the Transmitter's transmission facilities;
  - 4.7.6. megawatt and megavar readings, excluding revenue-metered quantities;
  - 4.7.7. the date and time at which the supply circuit breaker or high voltage interrupting(HVI) switch of the Customer's facility automatically trips;
  - 4.7.8. automatic relay protection operation at the Customer's facility impacting the Transmitter's transmission facilities;



- 4.7.9. upon request a Transmitter shall provide to the Customer a "relay and breaker trip report" which includes: the date and time of breaker trip and reclose or close; cause of incident if known; and quantity of load lost;
  - 4.7.10. substantial changes in power demand;
  - 4.7.11. changes in operating setup and operating diagrams;
  - 4.7.12. planned changes in each Party's facilities affecting its operation;
  - 4.7.13. line and load data required for protective relay settings;
  - 4.7.14. protective relay settings on equipment protection systems;
  - 4.7.15. annual facility performance data required for reliability organization reporting;
  - 4.7.16. notification of planned shutdown of a facility;
  - 4.7.17. Information on scheduling of maintenance outages;
  - 4.7.18. work protection Information; and
  - 4.7.19. all such other Information as the other Party may require in the circumstances.
- 4.8. Each Party shall keep Confidential Information confidential except:
- 4.8.1. as may be necessary in an emergency;
  - 4.8.2. to the extent required by law;
  - 4.8.3. if required in connection with legal proceedings, arbitration or any expert determination relating to the subject matter of the Code, this Agreement, or for the purpose of advising a Party in relation thereto; or
  - 4.8.4. to the extent required by the Party's licence; or
  - 4.8.5. to the extent required by the Market Rules or as may be required to enable a Transmitter to fulfill its obligation to any reliability organization.
- 4.9. If the Transmitter or the Customer become aware of any material change to any part of the Information contained within, or relevant to, a connection application or a change in its connection, then it shall promptly notify the other Party of the change in writing.

## 5. EQUIPMENT STANDARDS

- 5.1. The Transmitter and the Customer shall ensure that their respective new or altered equipment connected to the transmission system: (1) meets requirements of the Ontario Electrical Safety Authority; (2) conform to relevant industry standards including, but not limited to, CSA International, the Institute of Electrical and Electronic Engineers (IEEE), the American National Standards Association (ANSI), and the International Electrotechnical Commission (IEC); (3) conforms to good utility practices.

- 5.2. The minimum general performance standards for all equipment connected to the transmission system are set out in Appendix 2 of the Code. The Transmitter shall provide the technical parameters to assist the Customer to ensure that the design of the Customer's equipment connected to the transmission system shall coordinate with the transmission system to achieve compliance with the Code and this Agreement.
- 5.3. The Transmitter and the Customer shall fully cooperate to ensure that modelling data required by the Code and this Agreement for the planning, design and operations of connections are complete and accurate, and the Transmitter shall order required tests where there are grounds to question the validity of such data. This includes, but is not limited to, the information in Appendix 1, Schedule E, Parts (A) to (E), where applicable.
- 5.4. The Transmitter, at its discretion, may participate in commissioning, inspecting, and testing the Customer connection facilities to ensure that equipment connected to the transmission system will not materially reduce or adversely affect the current level of reliability of the transmission system.
- 5.5. The Customer shall permit the Transmitter to participate in any necessary commissioning, inspection and testing of its connection facilities to ensure that their equipment connected to the transmission system will not adversely affect the reliability of the transmission system.

## 6. OPERATIONAL STANDARDS AND REPORTING PROTOCOL

- 6.1. Equipment connected to the transmission system shall be operated and maintained in accordance with the Code and this Agreement.
- 6.2. The Transmitter shall specify the fault levels at all connection points, including the Customer's connection points, as required by the Market Rules, which shall be recorded in Schedule D to this Agreement.
- 6.3. The Transmitter shall promptly report to the Customer any changes in its equipment that could materially affect the transmission or connection services provided.
- 6.4. The Customer shall promptly report to the Transmitter any changes in its equipment that could materially affect the performance of the transmission system.
- 6.5. The Customer shall provide prompt notice to the Transmitter in accordance with the Code or as agreed in Schedule D to this Agreement before disconnecting its equipment from the transmission system.
- 6.6. Upon the Transmitter's request, the Customer shall promptly report to the Transmitter any and all incidents involving the automatic operation of the Customer's facility protective relaying that affect the Transmitter's transmission facilities.
- 6.7. Upon learning of any changes that affect the reliability of the Transmitter's transmission facilities, the Customer shall promptly submit a written report to the Transmitter describing any and all changes in the information that it submitted as registered system planning data in the connection application form, including, without limitation, changes to the Customer's facilities, equipment, and associated protective relaying or protective relaying settings, or any other changes of any kind whatsoever that might affect the reliability of the Transmitter's transmission facilities.
- 6.8. Upon learning of any changes that can affect the reliability of the Customer's facilities, the Transmitter shall promptly submit a written report to the Customer describing any and all changes, including, without limitation, changes to the Transmitter's facilities, equipment, and associated protective relaying or protective relaying settings, or any other changes of any kind whatsoever that might affect the reliability of that Customer's facilities.

## 7. DISCONNECTION

### 7.1. Voluntary Disconnection

- 7.1.1. The Customer may voluntarily disconnect its facilities permanently from the Transmitter's transmission facilities in accordance with procedures set out in the Code and this Agreement at any time during the term of this Agreement, provided that the Customer is not in default of its obligations hereunder.
- 7.1.2. The Customer shall give the Transmitter notice in writing of its intention to permanently disconnect its facility from the connection point in accordance with the procedure set out in the Code and this Agreement. Such notice shall be given ten (10) days before the date when the Customer wishes to disconnect.
- 7.1.3. Before the Customer's facilities are permanently disconnected from the Transmitter's transmission facilities, the Parties shall develop appropriate operating and decommissioning procedures for the Customer's facilities in accordance with the provisions of the Code and this Agreement.
- 7.1.4. The Customer shall pay all reasonable costs, including the removal of any of the Transmitter's equipment from the Customer's facilities, that are directly attributable to the voluntary disconnection and decommissioning of the Customer's facilities.
- 7.1.5. The Transmitter shall reconnect the Customer's facilities to its transmission system following a voluntary disconnection when it is reasonably satisfied that all obligations listed in this section are satisfied and that all other aspects of the Code and this Agreement are met.

### 7.2. Involuntary Disconnection

- 7.2.1. The Transmitter may disconnect the Customer's facilities, at any connection point at any time throughout the term of this Agreement in any of the following circumstances:
  - 7.2.1.1. in accordance with subsection 40 (5) of the Electricity Act, applicable law, its licence, the Market Rules, or provisions set out in the Code and this Agreement;
  - 7.2.1.2. in obedience to a decision by an arbitrator or court in accordance with the dispute resolution procedure set out in this Agreement.
  - 7.2.1.3. during an emergency in accordance with the provisions of the Code, this Agreement, and the Market Rules;
  - 7.2.1.4. if the Transmitter determines, acting reasonably, that the Customer's facilities do not comply with the Code (subject to section 2.6 of the Code), or other applicable codes and laws;
  - 7.2.1.5. if required by an order or direction from the IMO in accordance with the Market Rules;
  - 7.2.1.6. if the Customer is a defaulting Party; or
  - 7.2.1.7. upon termination of this Agreement.

### 7.3. Disconnection-General

- 7.3.1. The Customer shall continue to pay the applicable transmission rates during the notice period leading up to a disconnection.
- 7.3.2. The Customer shall pay all costs that are directly attributable to an involuntary disconnection, and decommissioning of its facilities, including the cost of removing any of the Transmitter's equipment from the Customer's property and shall cooperate in establishing appropriate procedures for such decommissioning.
- 7.3.3. For the duration of the disconnection the Transmitter shall not be obliged to fulfill any agreement to convey electricity to or from the Customer's facilities .

### 7.4. Reconnection after Involuntary Disconnection

- 7.4.1. The Transmitter shall reconnect the Customer's facilities to its transmission facilities following an involuntary disconnection when it is reasonably satisfied that the emergency, which was the cause of the disconnection, has ceased or has been rectified and all other requirements and obligations contained in the Code and this Agreement have been complied with.
- 7.4.2. The Transmitter shall reconnect the Customer's facilities to its transmission system following a non-emergency disconnection when it is reasonably satisfied that the reason for the disconnection no longer exists and
  - 7.4.2.1. the reason for the disconnection has been remedied to the Transmitter's satisfaction;
  - 7.4.2.2. remedies as determined in accordance with the dispute resolution procedure contained in this Agreement have been implemented and/or assurances have been given to the satisfaction of the affected Party that remedies or compensation shall be paid;
  - 7.4.2.3. the Customer has taken all necessary steps to prevent circumstances causing the disconnection from recurring and has delivered binding undertakings to the Transmitter that the circumstances leading to disconnection shall not recur; and
  - 7.4.2.4. the Customer agrees to pay reasonable reconnection costs as determined by the Transmitter.

## 8. LIABILITY

- 8.1. The Transmitter shall only be liable to the Customer and the Customer shall only be liable to the Transmitter for any damages which arise directly out of the willful misconduct or negligence:
  - 8.1.1. of the Transmitter in providing Transmission Services to the Customer;
  - 8.1.2. of the Customer during the period it is connected to the Transmitter's transmission facilities; or
  - 8.1.3. of the Transmitter or Customer in meeting their respective obligations under this Agreement, the Transmission System Code, their licences and any other applicable law.
- 8.2. Despite section 8.1, above, neither the Transmitter nor the Customer shall be liable under any circumstances whatsoever for any loss of profits or revenues, business interruption losses, loss of contract or loss of goodwill, or for any indirect, consequential, incidental or special damages, including but not limited to punitive or exemplary damages, whether any of the said liability, loss or damages arise in contract, tort or otherwise.



## **9. REPRESENTATIONS AND WARRANTIES**

### **9.1. Customers' Representations and Warranties**

- 9.1.1. The Customer represents and warrants to the Transmitter as follows, and acknowledges that the Transmitter has relied upon such representations and warranties in entering into this Agreement:
  - 9.1.1.1. that it has all the necessary corporate power, authority, and capacity to enter into this Agreement and to perform its obligations hereunder;
  - 9.1.1.2. that it has authorized by all required corporate action, the execution, delivery and performance of the terms, conditions, covenants and obligations contained in this Agreement;
  - 9.1.1.3. that its facilities meet the technical requirements of the Code and this Agreement, excluding equipments that are deemed compliant under section 2.6 of the Code which is listed in Schedule J of this Agreement; and
  - 9.1.1.4. that all required licences including but not limited to its Distributor or Generator licences , where one is required to carry out its business such as a Distributor and Generator licences, are in full force and effect.

### **9.2. Transmitters' Representations and Warranties**

- 9.2.1. The Transmitter represents and warrants to the Customer as follows, and acknowledges that the Customer is relying upon such representations and warranties in entering into this Agreement:
  - 9.2.1.1. that It has all the necessary corporate power, authority and capacity to enter into a Agreement and to perform its obligations hereunder;
  - 9.2.1.2. that its facilities meet the technical requirements of the Code and this Agreement;
  - 9.2.1.3. that it has authorized by all required corporate action, the execution, delivery and performance of the terms, conditions, covenants and obligations contained in this Agreement; and
  - 9.2.1.4. that its licence is in full force and effect.

## **10. REQUIREMENTS FOR OPERATIONS AND MAINTENANCE**

### **10.1. Work by the Transmitter's Staff on the Customer's Site and Facilities**

- 10.1.1. When the Transmitter's staff, its contractors, or agents work at the Customer's facilities or site, the Customer's safety and environmental requirements shall be observed by such staff, contractors and agents.
- 10.1.2. When the Transmitter can show the Customer, to the Customer's satisfaction, that the Transmitter's safety and environmental practices provide for an equivalent or better level of safety or environmental protection, the Customer shall give permission to work to the Transmitter's safety and environmental practices. As a minimum, all applicable statutes and regulations shall govern such work.

## **10.2. Work by the Customer's Staff on the Transmitter's Site and Facilities**

- 10.2.1. When the Customer's staff, its contractors, or agents work at the Transmitter's facilities or a site, the Transmitter's safety and environmental requirements shall be observed by such staff, contractors and agents.
- 10.2.2. When the Customer can show the Transmitter, to the Transmitter's satisfaction, that the Customer's safety and environmental practices provide for an equivalent or better level of safety or environmental protection, the Transmitter shall give permission to work to the Customer's safety and environmental practices. As a minimum, all applicable statutes and regulations shall govern such work.

## **10.3. Day-to-Day Operations**

- 10.3.1. Operations and maintenance shall be performed only by qualified persons.
- 10.3.2. The Customer shall be responsible for operating and maintaining its facilities as described in Schedule D to this Agreement and in accordance with provisions of the Code.
- 10.3.3. The Transmitter shall be responsible for the operating and maintaining its transmission facilities in accordance with the Code and provisions of this Agreement.

## **10.4. Controlling Authorities**

- 10.4.1. Each Party shall specify its controlling authority in accordance with the operations schedule attached to this Agreement.
- 10.4.2. The Transmitter and the Customer shall comply with all requests by the other Party's controlling authority in accordance with this Agreement and the Code.

## **10.5. Communication Between the Parties**

- 10.5.1. All communications between the Parties about day-to-day operating and maintenance matters shall at all times go through the controlling authorities, or those other persons to whom a controlling authority has delegated the communication authority.
- 10.5.2. Each Party shall provide the other with the name of a current 24-hour contact to respond to operating and maintenance matters, which shall be listed in a schedule to the Agreement.
- 10.5.3. The Customer shall provide the Transmitter with all necessary instructions for emergency responses, including reporting procedures and the names of site emergency co-ordinators.
- 10.5.4. The Transmitter shall provide the Customer with all necessary instructions for emergency responses, including reporting procedures and the names of site emergency co-ordinators.
- 10.5.5. Either Party shall provide the other with all required work protection documentation and notices in writing, by facsimile transmission, or by such other means as they may agree on in writing.
- 10.5.6. Where one Party's work requires the other's participation or cooperation, or in the other's opinion could adversely affect normal operation of its facilities, the Parties shall establish procedures and cost sharing criteria for the work and adhere to them in performing the work unless they agree otherwise in writing.

## **10.6. Switching**

- 10.6.1. A Party's controlling authority shall be responsible for establishing in writing for agreement by the other Party, the appropriate conditions for and the co-ordination of switching on the equipment under its control from time to time throughout the term of this Agreement.
- 10.6.2. When the Parties have so agreed in writing, one Party may appoint an employee of the other as its designate for switching-purposes.
- 10.6.3. The Customer shall comply with all switching instructions issued by the Transmitter's controlling authority to maintain the security and reliability of the transmission system. The two controlling authorities shall agree to procedures prior to undertaking any switching-operations.

## **10.7. Isolation of Customer's Facilities**

- 10.7.1. If the Customer requires isolation of its own facilities or facilities under the Transmitter's control, then the Customer's controlling authority shall:
  - 10.7.1.1. Deliver a written notice in accordance with the provisions of the Code and this Agreement by facsimile transmission to the Transmitter's controlling authority to ask for a condition guarantee.
    - 10.7.1.1.1. the notice shall set out the Transmitter's assigned equipment operating designations if applicable.
    - 10.7.1.1.2. the Customer's equipment designations shall be set out in the notice whenever the Transmitters' equipment operating designations have not been assigned.
- 10.7.2. Upon the request of one Party's controlling authority, the other Party's controlling authority or its designate shall provide the required timely isolation of equipment as required for emergency switching or to establish a condition guarantee.
- 10.7.3. The Transmitter shall provide to the Customer the isolation and reconnection of the Customer's equipment at the Customer's request at no cost to the Customer, once per year, during normal business hours. The Customer shall pay the Transmitter's reasonable costs for isolating and reconnecting the Customer's equipment if the requested isolation and reconnection is for a time outside of normal business hours.
- 10.7.4. The Transmitter shall charge the Customer, and the Customer shall pay, the reasonable costs incurred by the Transmitter for isolating and reconnecting the Customer's equipment for any isolation and reconnection request in excess of one per year as specified in section 10.7.3 above.

## **10.8. Isolation of Transmitter's Transmission Facilities**

- 10.8.1. If the Transmitter requires isolation from the Customer's facilities or isolation of facilities under the control of the Customer's controlling authority, then the Transmitter shall request the Customer's controlling authority to provide a condition guarantee.
- 10.8.2. The condition guarantee shall identify the Transmitter's assigned equipment operating designations.

## **10.9. Alternative Method of Isolation**

- 10.9.1. Either Party may establish its own work protection in place of a condition guarantee.

- 10.9.2. The controlling authority of the facilities required to establish the work protection shall provide the other Party with access to such facilities.
- 10.9.3. Establishing work protection shall be limited to hanging tags and locking of devices.

#### **10.10. Forced Outage**

- 10.10.1. When a forced outage by one Party adversely affects the other's facilities, the first Party's controlling authority shall give prompt notice to the controlling authority of the second Party.
- 10.10.2. Each Party's controlling authority shall have sole authority to identify the need for and initiate a forced outage on equipment under its control.

#### **10.11. Scheduling of Planned Work**

- 10.11.1. The Customer shall schedule all planned work with the Transmitter's controlling authority to co-ordinate outages that directly affect the Transmitter's transmission facilities.
- 10.11.2. The Customer shall, take all reasonable steps to ensure that its anticipated and planned outages for the upcoming year are submitted to the Transmitter by October 1<sup>st</sup> of each year.
- 10.11.3. At least four days in advance of planned work that requires a feeder breaker to be opened or operated and at least ten days in advance of planned work that requires operations of multiple feeder breakers, station bus or a whole transformer station, the Customer's controlling authority shall fax requests to the appropriate Transmitter contact identified in the operations schedule of this Agreement.
- 10.11.4. At least four days in advance of planned work, the Customer's controlling authority shall fax requests to the appropriate Transmitter contact identified in the operations schedule if the planned work involves:
  - 10.11.4.1. any disconnection from the Transmitter's transmission facilities of less than 50 kV e.g. disconnection from a feeder breaker owned by the Transmitter or by the Customer,
  - 10.11.4.2. load changes greater than 5 MW, or
  - 10.11.4.3. load transfers or switching operations that directly affect the Transmitter's transmission facilities,
- 10.11.5. The Transmitter's controlling authority shall notify the Customer's controlling authority at least four days in advance of any planned work that requires a feeder breaker to be opened or operated and at least ten days in advance of planned work that requires operations of multiple feeder breakers, station bus or a whole transformer station, that directly affects the Customer's facilities, by contacting the appropriate Customer contact identified in the operations schedule to this Agreement.
- 10.11.6. Either Party's controlling authority request in writing or by fax a change in the date and time of prescheduled work.
- 10.11.7. Notice of the requested change shall be given at least 2 working days in advance of the scheduled date, by fax,
- 10.11.8. If the change can be reasonably accommodated, both Parties shall establish a new date. If the Parties cannot agree, they shall refer the change to the dispute resolution process set out in section 13 of this Agreement



## **10.12. Shutdown of Customer's Facilities**

- 10.12.1. If the Customer's facilities are shutdown for any reason, its controlling authority shall contact the Transmitter's controlling authority, who shall investigate the reported event, using available evidence including input from the Customer's staff, to determine the cause of the shutdown.
- 10.12.2. The Customer shall not reconnect to the Transmitter's transmission facilities until first notified to do so by the Transmitter's controlling authority. Once the Transmitter is satisfied that reconnection will not cause any adverse effects on the transmission system, it shall immediately notify the Customer that reconnection can take place.

## **10.13. Emergency Operations**

- 10.13.1. During an emergency, either Party may take whatever immediate action it deems necessary and is qualified to perform to safeguard public safety, life, and property without first notifying the other Party.
- 10.13.2. The Party taking such actions shall promptly report them to the other Party's controlling authority.
- 10.13.3. The Transmitter may be required from time to time to implement load shedding as outlined in this Agreement, Schedule D, section 7.
- 10.13.4. The Customer shall identify the loads (and their controllable devices) to be included on the rotational load shedding schedules to achieve the required level of emergency preparedness.
- 10.13.5. The Transmitter may review the rotational load-shedding schedule with the Customer annually or more often as required.
- 10.13.6. The Customer shall comply with all requests by the Transmitter's controlling authority to shed load. Such requests shall be initiated to protect transmission system security and reliability in response to a request by the IMO.
- 10.13.7. When the Transmitter's transmission facilities return to normal, the Transmitter's controlling authority shall notify the Customer's controlling authority to re-energize the Customer's facilities.
- 10.13.8. The Transmitter may be required from time to time to interrupt supply to the Customer during an emergency to protect the stability, reliability, and integrity of its own facilities and equipment, or to maintain its equipment availability. The Transmitter shall advise the affected Customer as soon as possible/practical of the transmission system's emergency status and when to expect normal resumption and reconnection to the transmission system.

## **10.14. Access and Security of Facilities**

- 10.14.1. Each Party shall co-operate with the other to ensure that its respective facilities and assets are secure at all times.
- 10.14.2. Each Party shall follow all applicable procedures and staff training procedures required for expeditious access to the other Party's equipment or premises, including, without limitation, any procedures regarding access codes and keys.
- 10.14.3. Certain of each Party's facilities may, at the date of this Agreement or later, be on one or more of the other Party's sites, in accordance with each Party's policies and procedures.

- 10.14.4. Either Party and its representatives shall be entitled to access to the other's facilities or site, and the host Party shall grant such access, to carry out work at all reasonable times on reasonable prior notice to the host Party, subject to each Party's policies and procedures.
- 10.14.5. If either Party or its representatives wishes to have access to the other's facilities, the accessing Party shall notify the host Party of the particular work to be undertaken and of the date and time when it proposes to access the relevant facilities, subject to each Party's policies and procedures. The other Party shall not unreasonably withhold access to its facilities.
- 10.14.6. At any time when the accessing Party or its representatives are on or in the host Party's site, the accessing Party and its representatives shall
- 10.14.6.1. use all reasonable precautions not to damage or interfere with the host Party's site and facilities;
  - 10.14.6.2. observe the host Party's requirements for reporting occupational health and safety, electrical safety, environmental requirements, technical requirements, and matters of industrial relations; and
  - 10.14.6.3. neither ask questions, nor give any direction, instruction or advice to any person involved in operating or maintaining the site or facilities of the host Party, other than the person whom the host Party has designated for that purpose.
- 10.14.7. If the accessing Party or its representatives cause any loss or damage when given access to the host Party's site, the accessing Party shall promptly advise the host's controlling authority of the loss or damage.
- 10.14.8. Subject to subsection 10.14.7, a Party shall not, and shall ensure that its representatives do not, intentionally interfere with any of the other Party's facilities in or on its sites.
- 10.14.9. In an emergency a site owner may, as far as reasonably necessary in the circumstances, have access to and interfere with the other Party's facilities. The site owner shall use reasonable efforts not to cause loss or damage to the other Party's facilities. If the site owner interferes with any of the facilities, it shall indemnify the other Party for reasonable costs and expenses incurred from any resulting loss or damage.

## **11. TERM AND TERMINATION OF CONNECTION AGREEMENTS**

### **11.1. Coming into Force**

- 11.1.1. The term of this Agreement shall commence on the later date of either the execution date of this Agreement by both Parties or the date that subsection 26(1) of the Electricity Act is proclaimed, and shall remain in full force and effect until terminated in accordance with this Agreement's provisions.

### **11.2. Termination by a Non-Defaulting Party**

- 11.2.1. A non-defaulting Party may terminate the Agreement at any time during the term or any renewal thereof by giving the other Party six months' prior written notice setting out the termination date. Termination in the event of a default shall follow the procedures set out in section 12.4 of this Agreement.

### **11.3. Right to Disconnect**

- 11.3.1. If a non-defaulting Party gives notice to terminate the Agreement under section 12.2.1, the Transmitter shall disconnect the connection point on the termination date specified in that notice or on another date that the Parties have agreed upon in writing.

### **11.4. Right to Remove Assets**

- 11.4.1. When a non-defaulting Party has terminated the Agreement under section 8.2.1, the Transmitter may disconnect the connection point and shall be entitled to de-commission and remove any of its assets associated with the connection and the connection point.
- 11.4.2. The Transmitter shall notify the Customer in writing of the days the de-commissioning and removal of its assets shall occur, and the Customer shall provide the Transmitter with any and all access to the Customer's site, provided such dates and times are reasonable to both Parties, that may be required by the Transmitter to de-commission and remove its assets.

## **12. EVENTS OF DEFAULT AND TERMINATION**

### **12.1. Occurrence of an Event of Default**

- 12.1.1. If an event of default occurs, the non-defaulting Party may (without prejudice to its other rights and remedies as provided for in this Agreement) serve the defaulting Party with a default notice specifying the event of default that has occurred.

### **12.2. Cure Periods**

- 12.2.1. Upon service of a default notice, the defaulting Party shall be entitled to remedy the default specified in the default notice either:
- 12.2.1.1. within the cure period specified in Schedule C of this Agreement from the date of receiving the specified default notice; or
  - 12.2.1.2. within the cure period specified in a detailed plan to remedy the default, the terms of which are agreed to by the non-defaulting Party.
- 12.2.2. During the Cure Period, the defaulting Party (or any person on its behalf) shall diligently seek to remedy the event of default specified in the default notice. For a non-financial default, any remedy shall be made in accordance with good electricity utility practice.
- 12.2.3. If the defaulting Party or any person acting on its behalf does not diligently seek to remedy a non-financial default, then the non-defaulting Party may issue a notice ("End of Cure Period Notice") to the defaulting Party.
- 12.2.4. If, within ten business days of receiving the "End of Cure Period Notice", the defaulting Party does not commence and then pursue a remedy, then the Cure Period shall immediately end. The non-defaulting Party shall then be entitled to pursue its remedies in accordance with this section of the Agreement.

### **12.3. When Default is Remedied or Cured**

- 12.3.1. A financial default shall be remedied when:

- 12.3.1.1. the defaulting Party (or any person acting on its behalf) has paid any amount that is the subject of the financial default, including interest from the date of default until the date paid using the Transmitter's approved debt rate at the relevant time; and
  - 12.3.1.2. the defaulting Party (or any person acting on its behalf) has reimbursed all costs of enforcement, recovery, or attempted enforcement or recovery incurred, including reasonable legal costs and expenses, by the non-defaulting Party in respect of the relevant financial default.
- 12.3.2. A non-financial default, shall be remedied when:
- 12.3.2.1. The default has been remedied to the reasonable satisfaction of the non-defaulting Party; and
  - 12.3.2.2. The defaulting Party (or any person acting on its behalf) has reimbursed all costs of enforcement or recovery or attempted enforcement or recovery incurred, including reasonable legal costs and expenses, by the non-defaulting Party in respect of the relevant non-financial default.

## **12.4. Right to Terminate and Disconnect when an Event of Default Occurs**

- 12.4.1. A non-defaulting Party may, without prejudice to other rights and remedies provided for in this Agreement with respect to an Event of Default, which has not been remedied within the periods set forth below, terminate this Agreement by written notice to the defaulting Party:
  - 12.4.1.1. For an unremedied non-financial default, by giving twenty business days' notice in writing to the defaulting Party, stating its intention to terminate by the expiry of that notice period; or
  - 12.4.1.2. For an unremedied financial default, subject to giving seven business days' notice in writing to the defaulting Party, stating its intention to terminate by the expiry of that notice period.

## **12.5. Effect of Termination and Remedies**

- 12.5.1. Neither the Transmitter nor the Customer may terminate the Agreement except in accordance with the applicable provisions set out in the Code or this Agreement.
- 12.5.2. If either a Transmitter or a Customer chooses to terminate this Agreement pursuant to its rights under section 12.4, then upon termination the Agreement will, subject to section 12.5.3, be of no further force and effect.
- 12.5.3. The termination of this Agreement shall not affect any rights or obligations of either Party that may have accrued before termination, nor affect either Party's rights or obligations as set out in section 4, section 8 and section 13 of this Agreement, which will continue in full force and effect notwithstanding the termination of the Agreement.
- 12.5.4. Subject to section 13, upon termination of this Agreement, the non-defaulting Party choosing to terminate may pursue all available remedies including:
  - 12.5.4.1. sue the defaulting Party to recover damages for that event of default and, if it is a financial default, to recover the amounts owed including interest to be calculated using the Transmitter's approved debt rate at the relevant time;
  - 12.5.4.2. exercise all available legal and equitable remedies including, without limitation, injunctive relief or such other relief as it deems appropriate; and



## **12.6. Right to Disconnect Connection Point**

- 12.6.1. If the Transmitter is the non-defaulting Party, the default has not been remedied and the cure period has expired, it may, on providing a written notice ten business days in advance, disconnect the connection point where the default remains unremedied at the end of the ten business days notice period.
- 12.6.2. When either Party has terminated this Agreement, the Transmitter may disconnect the connection point and the Parties shall be entitled to de-commission and remove any of their respective assets associated with the connection and the connection point.

## **12.7. Rights and Remedies not Exclusive**

- 12.7.1. The rights and remedies of the Parties in this Agreement are not intended to be exclusive but rather are cumulative and are in addition to any other right or remedy otherwise available to the Parties at law or in equity. Either Party may exercise one or more of its rights and remedies from time to time, independently or in combination, without prejudice to any other right or remedy that either Party may have exercised. This subsection shall not operate to void the application of section 13 of this Agreement, to any dispute arising between the Customer and the Transmitter.
- 12.7.2. If any of the remedies provided for and chosen by a non-defaulting Party are found to be unenforceable, the non-defaulting Party may exercise any other right or remedy available to it at law or in equity.

## **13. DISPUTE RESOLUTION**

### **13.1. Exclusivity**

- 13.1.1. Except where this Agreement states otherwise, the dispute resolution procedures set forth in this Agreement shall apply to all disputes arising between the Customer and the Transmitter regarding the Agreement and the Code and shall be the only means for resolving any such disputes.
- 13.1.2. The dispute resolution procedures set forth in this Agreement do not apply to disputes in which the Transmitter or the Customer have not sought to have the matter referred in accordance with section 13.2.1 prior to this Agreement being terminated.

### **13.2. Duty to Negotiate**

- 13.2.1. Any dispute between the Customer and the Transmitter over this Agreement shall first be referred to a designated representative chosen by the Customer and to a designated representative chosen by the Transmitter for resolution on an informal basis.
- 13.2.2. Such designated representatives shall attempt in good faith to resolve the dispute within thirty days of the date when the dispute was referred to them, except that the Parties may extend such period upon which they agree in writing.
- 13.2.3. Any resolution of the dispute by the designated representatives shall be in writing and shall be executed by an authorized signing officer of each Party. The resolution shall bind the Parties and their respective successors and assigns, and shall not, except for either Party's subsequent failure to abide by the resolution, from then on be subject to arbitration or challenge in any court or other tribunal.
- 13.2.4. If either Party refuses to honour the designated representatives' resolution as executed, the other Party may immediately commence arbitration under this code to enforce the resolution.

### 13.3. Referral of Unresolved Disputes

- 13.3.1. If the designated representatives cannot resolve the dispute within the time period set out in subsection 13.2.2, either Party may submit the dispute to binding arbitration and resolution in accordance with the arbitration procedures set out below.

### 13.4. External Arbitration Procedures

- 13.4.1. Subject to subsection 13.5.2 below, the Parties shall submit any arbitration begun under this section to a single neutral arbitrator.
- 13.4.2. In choosing an arbitrator, the Parties shall negotiate in good faith. All arbitration taken under this Agreement shall be conducted in accordance with the *Arbitration Act*, 1991, S.O. c17 ("the Arbitration Act") as amended from time to time, except as modified herein.
- 13.4.3. The arbitrator(s) shall have exclusive authority to hear and decide any dispute between the Parties that is subject to arbitration under this Agreement or the Code.

### 13.5. Appointment of Arbitrator

- 13.5.1. If the Parties cannot agree upon a single arbitrator within fifteen days after referring of the dispute to arbitration, each Party shall within five more days choose one individual who shall sit on a three-member arbitration panel.
- 13.5.2. The two arbitrators chosen by the Parties shall within twenty business days, in good faith, choose a third person to be the third arbitrator, who shall chair the arbitration panel.
- 13.5.3. Neither Party may at any time during the arbitration revoke its choice of arbitrator, unless the other Party consents in writing.
- 13.5.4. If the Parties do not choose the two arbitrators within the time period set out in subsection 13.5.1, either Party or both Parties, with the five days set out in subsection 13.5.1, may apply to the court to appoint a single arbitrator.
- 13.5.5. The individual(s) chosen as the arbitrator(s) shall be qualified by education and experience to decide the matter. The arbitrator(s) shall be at arm's length from all Parties to the arbitration and shall not be members of the audit or legal firm or firms who advise any Party to the arbitration, nor shall the arbitrator(s) be otherwise regularly retained by any of the Parties to the arbitration.

### 13.6. Written Statement of Dispute and Response

- 13.6.1. Within twenty business days after the individual arbitrator or arbitration panel are named, the applicant shall submit to the arbitrator(s) a written statement. The statement shall set out:
- 13.6.1.1. the nature of the dispute and the applicant's positions and include the names of each Party's main contact for the arbitration process along with their addresses, phone numbers and fax numbers,
  - 13.6.1.2. any claims of relief,
  - 13.6.1.3. the grounds for that relief,

13.6.1.4. the proposed resolution or relief sought,

13.6.1.5. the names of any third Parties with material knowledge or Information relevant to the dispute, and

13.6.1.6. any documents that the Party wishes the arbitrator(s) to consider.

13.6.2. The responding Party shall have twenty business days to respond to the filing, setting forth its position and the Information that it deems relevant..

### **13.7. Discovery of Facts**

13.7.1. There shall be no discovery of facts taken, sought, or otherwise instituted by any means except as approved by the arbitrator(s).

13.7.2. The arbitrator(s) shall provide a time schedule for any such discovery.

13.7.3. The arbitrator(s) may at any time retain non-Party technical experts to advise and assist them during the arbitration. The advice of these experts shall be made known to the Parties.

### **13.8. Confidentiality of Documents**

13.8.1. All meetings and hearings shall be in private unless the Parties to the arbitration agree otherwise. The Party providing any document or other Information in the arbitration that would not otherwise be available to the other Party may in good faith designate it as confidential, provided that

13.8.1.1. the Parties shall first submit to the arbitrator(s) an agreed upon written statement of procedures for handling and protecting material designated as confidential, which the arbitrator(s) may accept or modify as they may deem appropriate. If the Parties cannot agree upon confidentiality procedures, the arbitrator(s) shall decide them as appropriate.

### **13.9. Procedural Rules**

13.9.1. The arbitrator(s) may adopt any procedural rules that they, at their sole discretion, deem appropriate to conducting the arbitration and facilitating the resolution of the dispute.

13.9.2. No procedural rule adopted by the arbitrator(s) shall extend the time period set forth in subsection 13.10.1; but the arbitrator(s) shall render a final disposition of the dispute within that period, which may not be extended or reduced unless the Parties consent in writing.

13.9.3. Refusal by either Party to comply with an order of the arbitrator(s) adopting or modifying any procedural rule shall constitute, in the sole discretion of the arbitrator(s), grounds for default and a finding in favour of the other Party.

### **13.10. Decision Requirements**

13.10.1. Any dispute submitted for arbitration under this section 13 shall be finally decided by the arbitrator(s) no later than thirty days from the completion of the hearing.

13.10.2. Unless the Parties agree otherwise in writing, the final decision of the arbitrator(s) shall

13.10.2.1. set forth in writing their findings of fact and any conclusions of law and

- 13.10.2.2. be based on the evidence before them, the applicable laws of Ontario and Canada, the Market Rules, the licences, the Agreement and any relevant decisions of courts, agencies, or earlier arbitrations under this Part.

- 13.10.3. A copy of the decision, with any Confidential Information expunged, shall be made available to the public.

### **13.11. Finality of Decisions**

- 13.11.1. The decision shall be final and binding on the Parties to the arbitration and shall not be subject to any appeal or review procedure.
- 13.11.2. Each Party hereby waives any and all rights or ground it believes that it has, or at any time after may have, to challenge, appeal in any way, or otherwise seek to set aside in any court or other tribunal any decision by the arbitrator(s).
- 13.11.3. Notwithstanding anything else in this sub-section, if either Party fails to act in accordance with the decision of the arbitrator(s), the other Party may then seek enforcement of the decision in any court of competent jurisdiction .

### **13.12. Arbitration Act (Ontario)**

- 13.12.1. Nothing in this Code shall be construed as affecting any rights available to the Parties under section 3 of the *Arbitration Act* (Ontario).
- 13.12.2. If and so far as any provision of section 13.11 is adjudged or otherwise deemed invalid by a court of competent jurisdiction, the provisions of the *Arbitration Act* (Ontario) shall apply.

### **13.13. Costs**

- 13.13.1. The arbitrator(s) shall award costs for an arbitration as if it had been a proceeding in Ontario Superior Court, and the arbitrator(s) shall therefore, in awarding or denying costs to a Party, follow:
  - 13.13.1.1. the provisions on costs set out in the Ontario Courts of Justice Act and the Ontario Rules of Civil Procedure, including without limitation the provisions in those rules concerning settlement offers; and
  - 13.13.1.2. case law applicable in Ontario.
- 13.13.2. If either Party fails to comply with the decision of the arbitrator(s) and the other Party afterwards seeks relief under subsection 13.12, the Party seeking the relief shall be entitled to receive from the other Party its costs of seeking the relief from the other Party (including its reasonable legal costs) once a court of competent jurisdiction has issued a final, non-appealable order in its favour.

## **14. FORCE MAJEURE**

### **14.1. Definition**

- 14.1.1. For the purposes of this section, "Force Majeure" or "an event or circumstance of Force Majeure" means any act of God, labour disturbance, act of a public enemy, war, insurrection, riot, fire, storm or flood, earthquake, or explosion; any curtailment, order, regulation, or restriction imposed by governmental, military or lawfully established civilian authorities; or any other cause beyond a party's reasonable control.



## **14.2. Limitation**

- 14.2.1. Subject to section 14.3, neither Party shall be held to have committed an event of default in respect of any obligation under this Agreement if prevented from performing that obligation, in whole or in part, because of a force majeure event.

## **14.3. Obligations in the Event of a Force Majeure**

- 14.3.1. If a force majeure event prevents a Party from performing any of its obligations under the Code and this Agreement, that Party shall:

- 14.3.1.1. promptly notify the other Party of the force majeure event and its assessment in good faith of the effect that the event will have on its ability to perform any of its obligations. If the immediate notice is not in writing, it shall be confirmed in writing as soon as reasonably practicable.
- 14.3.1.2. not be entitled to suspend performance of any of its obligations under this Agreement to any greater extent or for any longer time than the force majeure event requires it to do;
- 14.3.1.3. use its best efforts to mitigate the effects of the force majeure event, remedy its inability to perform, and resume full performance of its obligations;
- 14.3.1.4. keep the other Party continually informed of its efforts; and
- 14.3.1.5. provide written notice to the other Party when it resumes performance of any obligations affected by the force majeure event.

- 14.3.2. Notwithstanding any of the foregoing, settlement of any strike, lockout, or labour dispute constituting a force majeure event shall be within the sole discretion of the Party to the Agreement involved in the strike, lockout, or labour dispute. The requirement that a Party must use its best efforts to remedy the cause of the force majeure event, mitigate its effects, and resume full performance under this Agreement and the Code shall not apply to strikes, lockouts, or labour disputes

# **15. COMPLIANCE, INSPECTION, TESTING AND MONITORING**

## **15.1. Requirements**

- 15.1.1. The Customer shall inspect, test and monitor its facilities and equipment connected to the transmission system to ensure and maintain compliance with all applicable standards required by the Code and this Agreement. The Customer shall pay to the Transmitter all costs associated with such testing and monitoring of its own equipment that would be carried out by the Transmitter.
- 15.1.2. The Transmitter shall inspect, test and monitor its transmission system elements and equipment to ensure and maintain compliance with all applicable standards required by the Code and this Agreement.
- 15.1.3. The results of all compliance monitoring and performance testing required by the Code and this Agreement shall be made available to the Board upon request.
- 15.1.4. Every owner of transmission system elements and equipment shall maintain records setting out the results of all performance testing and monitoring conducted to demonstrate compliance with the Code and this Agreement in each particular case for seven years from the date of the testing or monitoring activity and shall make those records available to the Board upon request.

- 15.1.5. When requested by the Transmitter, the Customer shall produce test certificates certifying that its facilities have passed the relevant tests and comply with all applicable Canadian standards before connection.
- 15.1.6. The Transmitter may inspect the Customer's facilities and witness the commissioning tests related to new or replacement equipment that could reasonably be expected to affect the performance of the transmission system. The Customer shall pay the Transmitter all reasonable costs associated with such tests. Upon demand from the Transmitter, the Customer shall produce a certificate of approval, or exemption, from the Ontario Electrical Safety Authority.
- 15.1.7. The Transmitter has the right to specify by addendums to this Agreement the types of changes that require prior approval of the Transmitter before the Customer implements such changes. Such changes, that require prior approval of the Transmitter, shall be set out in Schedule A of this Agreement, and shall be limited to those that can have material adverse effect(s) on the Transmitters's transmission facilities or facilities of its other Customers.

## **15.2. Right of Entry**

- 15.2.1. The Customer shall allow the Transmitter access to its facilities subject to the Code and this Agreement to assess compliance, or to investigate any possible past or potential threat to the security of the transmission system.

## **16. GENERAL TECHNICAL REQUIREMENTS**

The Transmitter and the Customer shall follow the general technical requirements set out in Schedule F of this Agreement.

## **17. TECHNICAL REQUIREMENTS FOR GENERATORS**

The Transmitter and the Generator Customer shall follow the technical requirements for Generators set out in Schedule G of this Agreement.

## **18. TECHNICAL REQUIREMENTS FOR TAPPED TRANSFORMER STATIONS SUPPLYING LOAD**

The Transmitter, the Customer, who is either a Distributor or a Consumer, shall follow the technical requirements set out in Schedule H of this Agreement.

## **19. PROTECTION SYSTEM REQUIREMENTS**

The Transmitter and the Customer shall follow the protection system requirements set out in Schedule I of this Agreement.

## **20. OWNERSHIP OF FACILITIES**

- 20.1. All right, title and interest in and to the Transmitter's transmission facilities, including the revenue-metering equipment and instrument transformers(subject to the Market Rules which are in effect at the relevant time), shall continue to be vested in the Transmitter, unless the Parties have specified otherwise in Schedule A to this Agreement.
- 20.2. All right, title and interest in and to the Customer's facilities shall continue to be vested in the Customer, unless the Parties have specified otherwise in Schedule A to this Agreement.

## 21. TRANSMISSION SERVICE

The Transmitter hereby agrees to provide the transmission service to the Customer, and the Customer hereby agrees to accept the transmission services as outlined in the Transmission System Code, the Rate Order and this Agreement, in effect at the relevant time.

## 22. TRANSMISSION SERVICE CHARGES

For Transmitters whose transmission systems are under IMO Operating Control, the Customers shall pay the Transmission Service Charges, for the Transmission Services they receive to the IMO in accordance with the Market Rules, the Transmission System Code, the relevant Rate Order, and the Connection Agreement, in effect at the relevant time.

## 23. INCORPORATION OF SCHEDULES

Set out below are the schedules and appendices that form a part of, and that are hereby incorporated by reference into, this Agreement:

Schedule "A"	-	Single Line Diagram and Description of the Customer's Connection Point
Schedule "B"	-	Application of Transmission Rate Schedule
Schedule "C"	-	Cure Periods for Non-Financial Default Events
Schedule "D"	-	Details of Specific Operations
Schedule "E"	-	Customer Connection Information
		Part A: Generic Information
		Part B: Information Concerning Generation Facilities
		Part C: Impact Information Concerning Consumers and Distributor Facilities
		Part E: Transmission Facilities e.g. Tapped Transformer Stations and Circuit Breakers
		Part F: Other Data that the Customer must Submit to Transmitter
Schedule "F"	-	General Technical Requirements
Schedule "G"	-	Technical Requirements for Generators
Schedule "H"	-	Technical Requirements for Tapped Transformer Stations Supplying Load:
		(a) Transmitter's Tapped Transformer Stations
		(b) Distributor's and Consumer's Tapped Transformer Stations
Schedule "I"	-	Protection System Requirements
Schedule "J"	-	Exceptions to Customer's Representations, Warranties and Equipment Compliance Details
Schedule "K"	-	Data that Transmitter must Submit to Customer
		(a) Listing of information and data items subject to availability and confidentiality restrictions.
		(b) Other Information: to be specified based on site specific considerations.
Schedule "L"	-	Contacts for Purposes of Notice
Schedule "M"	-	Amendment Agreement Template

The Parties may append such additional Schedules to this Agreement as may be necessary, from time to time, and upon which they shall mutually agree. All such Schedules shall form a part of, and are hereby incorporated by reference into this Agreement.

## 24. NOTICE

Any notice or other writing required or permitted to be given under this Agreement or for the purposes of it, to any Party, shall be valid only if delivered in writing in accordance with this clause. Notwithstanding the foregoing, notices required to be given under Schedule "D" may be given in accordance with the notice provision in that Schedule. The addresses for delivery are as set out in Schedule "D" for the matters set out in that Schedule:

- a) to the Transmitter:  
To The Attention Of The Person Identified In Schedule L.
- b) to the Customer:  
To The Attention Of The Person Identified In Schedule L.

Notice sent in accordance with this section shall be deemed to have been delivered and received:

- a) if delivered by hand, upon receipt;
- b) if delivered by electronic transmission, 48 hours after the time of transmission, excluding from the calculation weekends and public holidays;
- c) if delivered by registered mail, six (6) days after the mailing thereof, provided that if there is a postal strike such notice shall be delivered by hand.

## **25. ASSIGNMENT**

The rights and obligations under this Agreement may not be assigned by the Customer to any other person without the prior written consent of the Transmitter which consent shall not be unreasonably withheld.

## **26. FURTHER ASSURANCES**

Each Party shall, upon the reasonable request of the other, do or cause to be done all further lawful acts, deeds, assurances whatever in order to more effectively carry out the intent and purpose of this Agreement.

## **27. WAIVER**

The failure of any Party to exercise any right, power or option or to enforce any remedy or to insist upon the strict compliance with the terms, conditions and covenants of this Agreement shall not constitute a waiver of the terms, conditions and covenants herein with respect to that or any other or subsequent breach thereof nor a waiver by the Party at any time thereafter to require strict compliance with all terms, conditions and covenants hereof, including the terms, conditions and covenants with respect to which the Party has failed to exercise such right, power or option. Nothing shall be construed or have the effect of a waiver except an instrument in writing signed by a duly authorized officer of the Party which expressly or impliedly waives a right, power or option under this Agreement.

## **28. ENTIRE AGREEMENT**

This Agreement, together with the schedules attached hereto, constitutes the entire agreement between the Parties and supersedes all prior oral or written representations and agreements of any kind whatsoever with respect to the matters dealt with herein.

## **29. AMENDMENTS**

Except as otherwise provided herein, no amendment, modification or supplement to this Agreement shall be valid or binding unless set out in writing and executed by the Parties with the same degree of formality as the execution of this Agreement.

29.1 The Transmitter and the Customer can jointly amend the following schedules of the Agreement:

- 29.1.1. Schedule A ;
- 29.1.2. Schedule B – limited to any approved changes to reflect a relevant new Transmission Rate Order;
- 29.1.3. Schedule D – limited only to Items 1., 2., 3., 4., 5., 6., and 9.;
- 29.1.4. Schedule E – limited only to Part F;
- 29.1.5. Schedule J - with due consideration to all relevant aspects of the Code and this Agreement;
- 29.1.6. Schedule K – limited only to Part (B);
- 29.1.7. Schedule L.

29.2. The Board may require amendments to this Agreement or the Schedules or Appendices to this Agreement.

29.3. The Parties to this Agreement agree to forthwith, upon receipt of notice from the Board, do all things and take all actions necessary to amend this Agreement as specified by the Board.

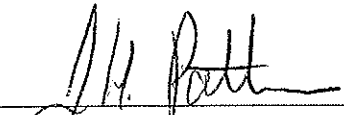
### 30. APPLICABLE LAW

This Agreement shall be construed and enforced in accordance with, and the rights of the Parties shall be governed by, the laws of Ontario and the laws of Canada applicable therein.

**IN WITNESS WHEREOF**, the Parties hereto, intending to be legally bound, have caused this Agreement to be executed by the signatures of their proper officers duly authorized in their behalf.

### SIGNED, SEALED AND DELIVERED

HYDRO ONE NETWORKS INC.

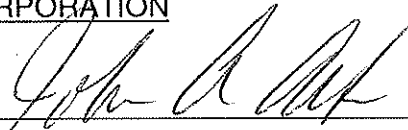
By: 

Name: Jim Patterson

Title: Manager

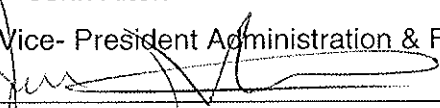
Dept.: Customer Contracts & Business Relations Dept.

NIAGARA WEST TRANSFORMATION CORPORATION

By: 

Name: John Alton

Title: Vice- President Administration & Finance

By: 

Name: James Detenbeck

Title: Vice- President Operations

I/We have authority to bind the Corporation

I/We have authority to bind the Corporation



## SCHEDULE A

### Diagram and Description of Connection Point Between Customer Facilities and Hydro One Networks Inc. Transmission Facilities

1. Customer:           Niagara West Transformation Corporation
2. ID Number:        542479
3. Connection Point Description: As listed within schedule D section 3 Tables as described within connection information.
4. Diagram: Refer to HONI operating diagrams as per section 4 within schedule D.
5. Customer Equipment on Hydro One Networks Inc. property and Hydro One Networks Inc. Equipment on Customers Property:

Customer Equipment on Hydro One Networks Inc. Property	Hydro One Networks Inc. Equipment on Customer Property
None	None





## **SCHEDULE B**

### **APPLICATION OF TRANSMISSION RATE SCHEDULE**

#### **1. Customer Eligibility**

Transmission Services are available to all Customers, as defined in the pertinent transmission Rate Order, that are directly connected to, and take power from, the Transmitter's transmission facilities.

For Transmitters whose transmission systems are under IMO operating control, Export Transmission Service is available to all Market Participants authorized under the Market Rules to cause electricity to be conveyed through or out of Ontario using the Transmitter's transmission facilities.

#### **2. Application of Transmission Rates by Delivery Point:**

- ⇒ Customer Name and ID Number: Niagara West Transformation Corporation, 542479
- ⇒ Customer's Type: Transmission LDC
- ⇒ Supply Voltage: 230 kV

<b>Tariff Delivery Point</b>	<b>Tx Point Number</b>	<b>Tx Connection Point</b>	<b>Network Pool Charge</b>	<b>Connection Transformation Pool Charge</b>	<b>Line Connection Pool Charge</b>
<b>NWTC MTS</b>	<b>1</b>	<b>NWTC T1-Q25BM</b>	<b>Yes</b>	<b>No</b>	<b>Yes</b>
	<b>2</b>	<b>NWTC T2-Q23BM</b>			

1. Details Of Embedded Generation Facilities: None
  - a) Installed Capacity
  - b) Technology Type
  - c) Fuel Type
  - d) Date of all required Government Approval
  - e) Qualification For Efficient Embedded Generation Status

#### **3. Arranging for Transmission Services**

The Customer or its representative shall not have access to Transmission Services until it has met all the requirements of the Code and this Agreement to the Transmitter's satisfaction, including the installation of all equipment required to connect the Customer to the Transmitter's transmission facilities and to meter the provision of the Transmission Service for the purpose of billing and settlement as per the relevant Rate Order approved by the OEB. All revenue type meters and associated equipment required for billing and settlement for Transmission Services shall meet the IMO's requirements, for Transmitters whose transmission systems are under IMO operating control, as described in the Market Rules and applicable procedures and standards.

#### **4. Point of Delivery and Point of Billing for Transmission Services**

The point of delivery, or Delivery Point, for the Transmission Services is the identified point of supply to the Customer from the IMO-controlled grid.

The point of billing for Transmission Services shall be aligned with IMO's Defined Point of Sale. Loss adjustments shall be made based on the IMO Metering Standards' site-specific loss adjustments prior to calculating transmission charges applicable to the Customer.

Each Delivery Point for a Customer shall be billed as a separate service, meaning a Transmission Customer having two or more Delivery Points will not be permitted to aggregate its demands.

Where a Delivery Point is common to two or more Customers, those Customers shall be permitted to aggregate demand at that Delivery Point if they are affiliates of each other within the meaning of Ontario's Business Corporations Act.

#### **5. Arranging for Export Transmission Service**

Each entity desiring to purchase Export Transmission Service shall first register as a Market Participant with the IMO as specified in the Market Rules. Once registered, a Market Participant may request Export Transmission Service by submitting scheduling and dispatch Information to the IMO as specified in the Market Rules.

#### **6. Rate Schedule for Transmission Services**

The Customer shall pay the transmission service charges for Transmission Services to the IMO in accordance with the Market Rules and in accordance with the transmission Rate Order in effect at the time.

#### **7. Information Requirements**

The Customer shall provide Information to the Transmitter as outlined in the appropriate schedules and appendices that form part of the Agreement. The Information shall include, but not be limited to, the following:

- a) The identity, address, telephone and facsimile number of the person requesting Transmission Facilities Service
- b) Agreement; start date, expiration date, and conditions for extension of term
- c) Identification of each Delivery Point connecting to the Transmitter's transmission facilities (IMO-controlled grid) including voltage supply level.
- d) A forecast of load requirements at each Delivery Point
- e) If applicable, identification of each Embedded Generation Unit rated 1 MW and above that is located in the premises of the Consumer or Distributor, along with the following Information:
  - i) Installed capacity
  - ii) Date when required approvals were obtained to install the Generator
  - iii) Technology Type
  - iv) Fuel Type
- f) If applicable, immediate written notice of material changes in any Information relating to that new Embedded Generation, its transmission or distribution system, or other aspects of the Customer's facilities or operations affecting the operation of the Transmitter's Transmission System.

## 8. Bills

The IMO will submit monthly invoices for Transmission Services to Market Participants that utilize the Provincial Transmission Service, as indicated in transmission Rate Order.

The IMO will submit invoices for Export Transmission Service at the same time as it submits invoices for energy related charges to the Market Participants that utilize Energy service, as indicated in the transmission Rate Order.

The Market Rules and the OEB-Approved Transmission Rate Order require that the regulated Transmission Service charges payable by the Transmission Customers shall be collected by the IMO. The billing and settlement processes used by the IMO are designed to collect transmission service charges from entities that are registered as Market Participants with the IMO, using meter readings totalized and loss adjusted for Delivery Points defined for the purposes of determining transmission service charges. In accordance with the Transmission Rate Order, the Transmission Customer shall ensure that Registered Wholesale Meter(s) used for the purpose of determining transmission service charges, which may also be used for billing and settlement for energy and other components in the IMO-Administered markets, satisfy the Wholesale Metering requirements and associated obligations specified in Chapter 6 of the Market Rules, including the appendices therein.

A Transmission Customer may wish to designate to another entity that is a Market Participant the responsibility for paying some or all transmission service charges payable by the Transmission Customer.

A Transmission Customer may designate the responsibility for paying transmission service charges and the responsibility for satisfying the Wholesale Metering requirements and associated obligations specified in Chapter 6 of the Market Rules to another entity, called Transmission Customer Agent for the purpose of this designation.

The Transmission Customer shall formally submit such designation to the Transmitter by filling out the attached form duly signed by both the Transmission Customer and the Transmission Customer Agent. Such designation shall be made on the basis of the Transmission Delivery Points and associated connection points with respect to which the Transmission Customer has designated the obligations to the Transmission Customer Agent.

The designated Transmission Customer Agent, and the Transmission Customer if it retains any or all responsibility for payment of transmission service charges, shall register as a Market Participant with the IMO and shall be subject to all the requirements of the Market Rules.

The transmission service charges payable by a Transmission Customer Agent, where applicable, will be calculated by the IMO as though the Transmission Customer Agent were the Transmission Customer with respect to the designated connection points at the Transmission Delivery Point(s). The demand designated to a Transmission Customer Agent by a Transmission Customer shall not be aggregated with any demand for which (a) the same Transmission Customer retains the obligation to pay transmission service charges, (b) the same Transmission Customer designates the obligations to another Transmission Customer Agent, or (c) another Transmission Customer designates the obligation to a Transmission Customer Agent.

**The form on the following page may be used to designate a transmission customer agent.**



## Hydro One Networks Inc. - Transmission Customer Agent Designation Form

The undersigned Transmission Customer hereby transfers to the undersigned Transmission Customer Agent, and the undersigned Transmission Customer Agent hereby assumes and agrees to honour, all obligations and responsibilities for the Registered Wholesale Meter(s) and for the payment of transmission service charges associated with the connection points listed below. This transfer of obligations and responsibilities is in accordance with Appendix 1, Schedule B, Section 8 of the Connection Agreement between the Transmission Customer and the Transmitter. The undersigned Transmission Customer Agent hereby agrees to register as a Market Participant with the IMO and to be subject to all the requirements of the Market Rules for the purposes of payment of transmission service charges associated with the Transmission Delivery Points and associated connection points listed below. The Transmission Customer and the Transmission Customer Agent, as applicable, undertake to notify and to oblige their respective Meter Service Provider(s) to ensure that the Meter Registry data maintained by the IMO in accordance with Chapter 6 of the Market Rules is updated consistent with this designation.

List of Transmission Delivery Points and Associated Connection Points for which Obligations and Responsibilities Are Transferred

Transmission Delivery Point	Description of Associated Connection Points
NIAGARA WEST MTS	T1: 1000007110 / 1000007111
TX DP#s 108639, 108641	T2: 1000007120 / 1000007121

On Behalf of Transmission Customer

Signed:

Title:

Date:

Business Name and Address:

4548 ONTARIO ST  
BEANSVILLE, ONT  
L0R 1B5  
Niagara West Transformer  
Corporation

Received By:

Hydro Networks Inc.

Signed:

Title:

Date:

Manager - Customer Contracts & Business Relations  
Feb 27/04

On Behalf of Transmission Customer Agent

Signed:

Title:

Date:

Business Name and Address:

4548 ONTARIO ST  
BEANSVILLE, ONT  
L0R 1B5  
PENINSULA WEST UTILITIES  
LIMITED

The designation contained herein shall be effective once the Meter Service Provider(s) for the Transmission Customer Agent and Transmission Customer submits the information required in accordance with the change management process for the Meter Registry maintained by the IMO.



## SCHEDULE C

### CURE PERIODS FOR NON-FINANCIAL DEFAULT EVENTS

<b>Areas of Impact</b>	<b>Cure Period</b>
Safety – Immediate	<b>Promptly</b>
Environment – Immediate	<b>Promptly</b>
Asset Integrity	<b>Promptly</b>
Security	(not applicable – IMO accountability addressed in Market Rules)
Adequacy	(not applicable – IMO accountability addressed in Market Rules)
Safety – Potential	<b>10 DAYS</b>
Power Quality	<b>30 DAYS</b>
Environment – Potential	<b>30 DAYS</b>
Maintenance	<b>60 DAYS</b>
<b>Any Other Areas of Impact</b>	<b>30 DAYS</b>

#### Areas of Impact

**Safety – Immediate:** Any aspect that could result in immediate injury or loss of life (e.g. exposed wires, destroyed station fence, etc.).

**Environment – Immediate:** Any aspect that could result in immediate impact on the natural system of land air, water, plants, and animals, including humans and their social, economic and cultural interactions with the system.

**Asset Integrity:** The extent to which an asset is operated within prescribed ratings (voltage, thermal, short circuit) and maintained to required standards to prolong asset lifespan and satisfy safety and environmental requirements.

**Security:** The ability of the transmission system to withstand sudden disturbances such as short circuits or unanticipated loss of system facilities.

**Adequacy:** The ability of the transmission 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 or components.

**Safety – Potential:** The threat to human life depends on the occurrence of a single contingency (e.g. substandard grounding)

**Power Quality:** Any variation in electric power service resulting in misoperation or failure of end-use equipment such as voltage sag, overvoltage, transients, harmonic distortion and electrical noise.

**Environment – Potential:** The threat to the environment depends on the occurrence of a contingency (e.g. inadequate oil spill containment barriers).

**Maintenance:** Work that has to be performed in order to ensure the proper operation of equipment.

The non-defaulting Party shall determine the applicable area of impact.





**SCHEDULE D****DETAILS OF SPECIFIC OPERATIONS****1. Telephone Contacts**

Either Party has the right to change the position designations and telephone numbers listed below with immediate effect at any time by notice in writing delivered to the other Party by fax or other telegraphic means. Any employee of a Party with apparent authority may deliver such a notice to the other Party.

**Day-to-Day Operation**

For the Operation of **HYDRO ONE NETWORKS INC. (Transmitter)** Transmission Network and **Niagara West Transformation Corporation (Customer)** connection.

	<b>TRANSMITTER</b>	<b>CUSTOMER</b>
<b>Operating Contacts (Real time)</b>		
<b>(Controlling Authority)</b>		
Position:	Senior Shift Operator	Shift Supervisor
Location:	Middleport	Grimsby
Phone Number:	1-877-882-9194	905 945-5437
** Emergency Number:	1-905-765-7303	905 945-2638
		Aft Hrs 905 TBA
Fax Number:	905-765-7322	905 945-9933
<b>Outage Planning (Pre-event)</b>		
Position:	Outage Planner Middleport	Brian Weber
Location:	HONOC - Barrie	Manager
Phone Number:	705-792-3122	Grimsby
Fax Number:	705-792-3151	905 945-5437 x 221
Email Address:		905 945-9933
		brianw@grimsbypower.com
<b>Operating Performance &amp; Customer Support (Post Event)</b>		
Position :	<b>Senior Network Management Officer</b>	Manager
Name:	Terry Brown	Brian Weber
Location:	HONOC – Barrie	Grimsby
Phone Number:	705-792-3113	905 945-5437 x 221
	905-975-2703 (cell)	
Fax Number:	705-792-3116	905 945-9933
Email Address:	Terry.brown@HydroOne.com	brianw@grimsbypower.com
<b>Operations Manager (Real Time)</b>		
Position:	Operating Manager (acting)	Director of Engineering
Name:	Tim Shannon	Richard Chrapala
Location:	TOMC - Richview	Grimsby
Phone Number:	416-240-6432	905 945-5437 x 223
	416-938-4093 (cell)	
Fax Number:	416-240-3788	905 945-9933
Email Address:	Tim.shannon@HydroOne.com	richardc@grimsbypower.com

**Notes:**

\*\* Hydro One Networks has installed an emergency phone line that will be answered on a priority basis. The number is provided for your use exclusively as per the following criteria:

1. To reach an Operator when public/employee safety is at risk (i.e. downed power line but still energized, public inside transformer station fence, public climbing towers. Power line on a vehicle with people trapped inside, public contact with a live conductor).
2. To reach a Hydro One Operator when a serious environmental impact is possible.

Accounting Centre: TCT, Hydro One Inc.,  
Head Office, Trinity Square,  
483 Bay Street,  
Toronto, Ontario  
M5G 2E1

**Contract Administration For Operating Service**

	<b>TRANSMITTER</b>	<b>CUSTOMER</b>
Position:	Account Executive	Vice President of Operations
Name:	Robert Davidson	James Detenbeck
Location:	Burlington	Grimsby
Phone Number:	905-681-4281 905-517-8638 (cell)	905 945-5437
Fax Number:	905-681-4287	905 945-9933
Email Address:	<a href="mailto:Rob.davidson@HydroOne.com">Rob.davidson@HydroOne.com</a>	
Position:	Senior Network Management Officer	Vice President of Finance
Name:	Terry Brown	John Alton
Location:	HONOC – Barrie	Beamsville
Phone Number:	705-792-3113 905-975-2703 (cell)	905-563-5550 905-687-0827
Fax Number:	705-792-3116	905-563-9140
Email Address:	<a href="mailto:Terry.brown@HydroOne.com">Terry.brown@HydroOne.com</a>	<a href="mailto:john@penwest.on.ca">john@penwest.on.ca</a>

**2. Description of Facilities**

**Niagara West Transformation Corporation** is jointly owned by Grimsby Power Inc. and Peninsula West Utilities Limited and owns the Niagara West MTS to supply load to both utilities. The corporation is headquartered in the Pen West Utilities office located in the City of Beamsville, Ontario.

The Transmitter will provide real-time operation of Niagara West MTS under the terms and conditions of the Operating Service Agreement

### **3. Ownership and Controlling Authority (Operating Control)**

A Party may change its designated controlling authority set out below at any time during the term of the Agreement, subject to the following conditions:

1. (a) The Transmitter may change its designated controlling authority only for the Transmitter' s owned (transmission) facilities.

(b) The Customer may change its designated controlling authority only for the Customer owned facilities.

(c) Either Party shall notify the other in writing of any change in its designated controlling authority at least ten business days before implementing a change.

(d) Notification of any changes to the controlling authority shall be exchanged between the Transmitter and the Customer as follows:

TRANSMITTER	CUSTOMER
<ul style="list-style-type: none"> <li>• Senior Technical Officer (see section 1)</li> <li>• All affected Controlling Authorities and TOMC</li> </ul>	<ul style="list-style-type: none"> <li>• VP of Finance - John Alton</li> <li>• All affected Controlling Authorities</li> </ul>

**The Transmitter Controlling Authority has control over the following;**

All Equipment identified as Transmitter owned Equipment except where otherwise indicated.

**The CUSTOMER Controlling Authority has control over the following;**

All Equipment identified as Customer owned Equipment except where otherwise indicated.

Continued on next page: ↓

<b>Niagara West MTS NA2508</b>	
<b>Transmitter owns the following:</b>  <b>Note: * Indicates Controlling Authority belongs to Customer</b>	<b>Customer owns the following:</b>  <b>Note: * Indicates Controlling Authority belongs to Transmitter</b>
<b>Transformers</b>  None	<b>Transformers</b>  2508T1, 2508T2, SS1, SS2
<b>Breakers</b>  None	<b>Breakers</b>  2508T1B, 2508T2Y, 2508BY, 2508M1, 2508M2, 2508M3, 2508M4, 2508M5, 2508M6
<b>Switches</b>  2508T1-MSO (Q25BM) 2508T2-MSO (Q23BM)	<b>Switches</b>  2508T1-Q25BM, 2508T1-G, 2508T2-Q23BM, 2508T2-G, 2508SS1-T1, 2508SS2-T2, T1B-B-G, T2Y-Y-G, BY-Y-G, BY-B-G, M1-B-G, M2-B-G, M3-B-G, M4-Y-G, M5-Y-G, M6-Y-G, BVT-B, YVT-Y
<b>Current/Voltage Transformers</b>  None	<b>Current/Voltage Transformers</b>  2508T1VT, 2508T1CVT, 2508T2VT, 2508T2CVT, 2508BVT, 2508YVT
<b>HT Circuits:</b>  Q23BM & Q25BM up to and including the strain insulators on the Customer switch structure	<b>Feeders:</b>  M1,M2, M3, M4, M5, M6
<b>Protection Systems</b>  Q23BM & Q25BM are protected by the Transmitter's standard 230kV line protections	<b>Protection Systems</b>  Line backup – Distance and Ground fault protection  Transformer – "A"&"B" differential, "A"&"B" inst. & timed overcurrent and inst. & timed ground overcurrent. "A"&"B" R/T. "A" main and tapchanger gas protection.  T1B, T2Y & BY breakers – I&T O/C, I&T Grd O/C, breaker fail.

## D.5

	<b>Protection Systems – Cont.</b>  <b>Bus protection-</b> High speed differential, timed O/C  <b>Feeder protection – “I”&amp;”T” O/C, “I”&amp;”T” grd. O/C, directional O/C, UFLS, breaker fail.</b>
<b>Remote Terminal Unit</b>  <b>None</b>	<b>Remote Terminal Unit</b>  <b>D25</b>
<b>Telecommunications</b>  <b>None</b>	<b>Telecommunications</b>  <b>2 X 4 wire for R/T</b>  <b>SCADA data pair</b>

#### **4. Single Line Diagram**

**Note:** Please refer to the latest revision of print on file for operating purposes.

<b>Print Owner</b>	<b>Print Reference #</b>
<b>Transmitter</b>	Transmitter print # Part of NKW25-2
<b>Customer</b>	Customer to provide 2 copies, drawing number

The Transmitter agrees to provide the Customer with a copy of its single line diagram detailing the Customers connection point to the Transmitter. Where the Transmitter's single line diagram contains connection information for more than one Customer, the Customer authorizes the Transmitter to provide the information contained on the single line diagram to the Transmitter's other customers shown on the said document.

#### **5. Metering Facilities Diagram**

This diagram is based on the protection, control, and metering diagram. If Hydro One Networks Inc. is not your Meter Service Provider (MSP) please provide metering facilities diagram. If Hydro One Networks Inc. is your MSP, provide drawing number submitted as part of Schedule E Customer Connection Information.

#### **6. Normal Operations**

This Section includes **Customer-specific** Information during normal operations.

##### **6.1 Hold Off Procedure**

A procedure implemented by a Controlling Authority to limit operation of apparatus, to facilitate work or reduce hazards. Under no circumstances shall a Hold-Off Procedure be used in place of a work protection. When a hold-off is in effect on a line or other apparatus, it shall not be re-energized following an automatic trip until communication is established with the holder and his/her consent is obtained. It is a basic requirement of hold-off procedures that suitable communication be established and maintained between the controlling authority and the person issued the hold-off.

##### **6.2 Switching**

The Customer must comply with the **Code** when performing all switching operations.

One winding must be taken out-of-service when a feeder parallel is made between Niagara West MTS and Beamsville TS or Vineland DS.

### **6.3 Idiosyncrasies**

Niagara West MTS is operated by the transmitter under the terms and conditions of the Operating Services Agreement.

## **7. Emergency Operations**

### **7.1 Load Shedding**

#### **(a) Scope:**

This instruction assigns authority and defines responsibilities for manual primary load shedding that may be required to correct abnormal conditions on the IMO-controlled grid or the Transmitter's transmission facilities. Procedures are also outlined for conducting simulation of rotational load shedding.

#### **(b) Information:**

From time to time the IMO-controlled grid or the Transmitter's transmission facilities may experience abnormal conditions. To minimize their impact, and to restore and maintain security of operations, prompt control action must be taken. The control actions are numerous and vary according to the abnormal condition.

In extreme situations, the only way to correct abnormal conditions may be to shed primary firm load. Recognizing the impact on the Customer this control action must be pre-planned as much in advance as possible. Rotational load shedding of primary firm load provides assurance that the abnormal condition will be quickly corrected while allowing for Customer selectivity. The schedule shall comply with the IMO's rules, procedures and policies in effect at the relevant time.

#### **(c) Response to Controlled Rotational Load Shedding:**

The request to implement a controlled rotation load shed will be as directed by the IMO and can come from the Transmitter's controlling authority located at the Transmitter's territory operating centre. The request for implementation will follow this model:

"To comply with directions from the IMO, this is the Transmitter's controlling authority calling. We are currently implementing a rotational load shed. Would you please reduce your load to X MW's. You will be notified when conditions allow you to return to full load."

The Customer's response will follow this model:

"I understand that the Transmitter's controlling authority is implementing a rotational load shed and that I am to reduce load to X MW's. Is that correct?"

The Transmitter's controlling authority will confirm the request.

**(d) Response to Controlled Rotational Load Shedding Simulation:**

The request to simulate a controlled rotation load shed will be as directed by the IMO and can come from the Transmitter's controlling authority located at the Transmitter's territory operating centre.

The request for simulation will follow this model:

"To comply with directions from the IMO, this is the Transmitter's controlling authority calling. We are currently simulating a rotational load shed. Would you please simulate a load shed of X MW's. Please inform me of your steps and the actual amount of the simulated load shed you are able to achieve."

The Customer's response will follow this model:

"I understand that the Transmitter Controlling Authority is simulating a Rotational Load Shed and that I am to simulate a load shed of X MW's. Is this correct?"

The Transmitter's controlling authority will confirm the request and both operators will remain on line to review procedure and collect information.

**(e) Types Of Load Shedding:****Under-Frequency Load Shedding**

Under-frequency Load Shedding schedules shall identify a block of load equivalent to 25% of the load controlled by each Controlling Authority. The block of load identified should not include load connected to Under Frequency Load Shedding Relays (UFLS).

**Emergency Load Shedding**

Emergency Load Shedding schedules shall identify where 100 MW, 200 MW, etc, of load can be shed at any given time.

Because of the varying load profiles, the Transmitter's Controlling Authority is responsible to ascertain where load can be shed on a shift by shift basis.

Since it is likely that Emergency Load Shedding will evolve into Rotational Load Shedding, consideration should be given to selecting load that is from a part of the Rotational Load Shedding schedule which would be cut later in the rotation, rather than at the anticipated starting point on the Rotational Load Shedding Schedule. This is to avoid the load being cut for an extended period of time.

**Rotational Load Shedding**

Rotational Load Shedding schedules shall outline the primary firm load under the control of the Transmitter's Controlling Authority identified in Section 3, arranged in relatively equal Megawatt (MW) blocks representing a percentage of the load under his control.

**7.2 Conditions of Restoration**

The Transmitter's Operator will attempt to close the feeder breaker 1 minute after a feeder lock-out. The Transmitter's Operator will contact the Customer's Controlling Authority for direction with regards to closing a feeder breaker after an unsuccessful close attempt.



### 7.3 Other

## **8. Re-verification Schedules-Protection and Control**

1. A Customer shall re-verify its station protections and control systems that can impact on the Transmitter's transmission system. The maximum verification or re-verification interval is: four (4) years for most of the 115 kV transmission system elements including transformer stations and transmission lines, and certain 230 kV transmission system elements; and two (2) years for all other high voltage elements. The maintenance cycle can be site specific.

2. The Customer shall advise the Transmitter at least fourteen (14) business days' notice of its intention to conduct a re-verification test, so that the Transmitter's protection and control staff and system performance staff (if required) can observe.

a) re-verification of protection equipment settings specified in this Agreement.

b) relay re-calibration

c) test tripping of station breakers that impact on the Transmitter/Customer interface measurement and analysis of secondary AC voltages and currents to confirm measuring circuit integrity as well as protection directioning.

d) measurement and analysis of secondary AC voltages and currents to confirm measuring circuit integrity.

**Note:** All tests must be coordinated and approved ahead of time through the normal outage planning process.

3. The following specific actions are required:

a) observe all station protections that trip and open the following devices for proper operation

<b>Type of Equipment</b>	<b>Equipment Designation</b>
<b>Breakers</b>	<b>2508T1B, 2508T2Y, 2508BY</b>
<b>Circuit Switches</b>	<b>2508T1-Q25BM, 2508T2-Q23BM</b>
<b>Other</b>	<b>None</b>

b) confirm that settings approved by the Transmitter are applied to the following protections:

- (i) over and under voltage;
- (ii) transformer differential;
- (iii) transformer phase and ground backup protection;
- (iv) line protections;
- (v) breaker or HVI failure protection; and
- (vi) transfer and remote trip protections.

## **9. General Protections**

1. There are line protections at Site.
2. Transformer faults are cleared by the Transmitter's high voltage (HV) and the Customer's medium (MV) breakers.
3. The transformer protection sends a trip to the Transmitters network transformer station or switching station.
4. Breaker failure protection sends transfer trip and it is then cascaded to other stations.
5. Under Frequency Load Shedding relays that operate as follows:

**(Set out Particulars)**

## **10. Telecommunication Facility Details for Protection and Control Applications**

### **(a) Telecommunication Medium**

The communication medium used will be two (2) leased telephone circuits from Bell Telephone and these circuits are the responsibility of the Customer.

### **(b) Types of Telecommunication Channels**

Information required from customer

number of Blocking Channels - 0

number of Remote Trip Channels - 0

number of generation rejection trip channel - 0

number of transfer trip channels - 4

### **(c) Ownership of Telecommunication Terminal Equipment**

The terminal equipment located at a given facility is owned by the Customer. The communication medium (leased telephone circuits) is considered to be owned by the Customer. The terminal equipment located at a switching station is owned by the Transmitter.

### **(d) Responsibility for Work and Costs Associated with Breakdown and Routine Maintenance**

If maintenance is required on the terminal equipment located at the Customer's facility, the Customer will bear all incurred costs. If maintenance is required on terminal equipment located at sites owned by the Transmitter, the Transmitter will bear all incurred costs.

If maintenance or repair is required on the leased telephone circuits, the Customer will incur all associated costs.

These costs will include charges by Bell Telephone and the Transmitter if its personnel are required to participate in any of the related activities.

**(e) Re-verification Schedule**

Routine Maintenance on communication equipment and the communication channels must be performed every two years.

**(f) Inventory of Communication Equipment**

The provision of spare communication equipment is the Customer 's responsibility and will be located at its site.

**(g) Failure of Communication Equipment**

If a communication failure affects either the transfer trip channels or the blocking channels:

The Transmitter will decide whether or not the Customer should remain connected to the high-voltage system. The Transmitter must advise the Customer, through the appropriate communication protocol outlined in this code, of the situation, the choices available to the Customer and the risks involved. Since the Transmitter will take the decision according to its own interests, the Customer can choose to remain or separate from the high-voltage system at its own risk.

**(h) Mean Time for Repairs**

The mean time for repairs will be within two working days, dependent on the availability of staff of Bell Telephone and the Transmitter.

**(i) Provision of Purchase Order by Customer to Transmitter**

The Customer will provide the Transmitter' s designated leader with a purchase order, so that the Transmitter may apply appropriate charges to the Customer.

## **11. Incident Analysis Report – Template**

Incident #: xxxxxxx  
 Date of Incident: yy-mm-dd hh-mm-ss  
 Incident Type: Plant Trip

### **Incident Description:**

The plant was at full load, and all systems and processes were stable. At hh-mm-ss on yy-mm-dd, a fault on the Transmitter's 230 kV circuit P by Y from A to B caused both transformers to separate from the grid.

### **Investigation Description:**

The following relays were activated:

In Plant: Under voltage  
 Primary Relays: Distance Relay, Directional Overcurrent Relay.  
 Switchyard: Breakers that tripped and trip module flags.

The Transmitter's Controlling Authority was contacted, and they stated that there had been numerous electrical faults and disturbances due to weather conditions. Heavy rainfall was experienced during the night, turning to freezing rain in early morning. The plant was restored without incident within xx hours.

### **Conclusion:**

The plant tripped incorrectly due to grid faults and disturbances.

### **Recommendation:**

	<u>Action Required</u>	<u>By</u>
1.	Identify the contingency that caused the Equipment to trip.	The Transmitter
2.	Consult the Transmitter's P&C and System Performance to identify over-sensitive relay settings.	The Transmitter and the Customer

### **Supporting Evidence Attached with this report:**

1. Sequence of Events Recordings (SER).
2. Digital Fault recordings (DFR).
3. Power Quality Monitor recordings (PQM).
4. Alarm logs, trip flags etc.

Investigator: name Title:

Date Report Issued: yy-mm-dd

## **12. Embedded Generation**

The Parties acknowledge that the Customer is not responsible for embedded generators that could impact on the Transmitter. In the event that the terms of any arrangements described now or in the future are amended in any way, the Customer shall immediately provide details of such amendment to Transmitter and the Parties shall revise this section accordingly.

In the event that the Customer acquires additional generators after the date upon which the Connection Agreement is executed, the Customer shall expeditiously without delay, provide details of such connections to Transmitter.

**Operations Agreements between the Customer and the "Customer Generating Stations (CGS)" connected to the Customer's distribution system, are separate from this document.**

### **INFORMATION**

<b>Generator</b>	<b>Location</b>	<b>Size</b>	<b>Voltage</b>	<b>Protections</b>

### 13. Operations – Data Acquisition

The Customer will provide switch, transformer, bus, breaker and feeder information to the Transmitter. This is done using an "RTU to master" link between the Customer's RTU and the master SCADA computer at Middleport TOC.

The communication circuit is the responsibility of the Customer

### Table of Points monitored

Connection	Amps	Volts	MW	MX	Status	Other (specify)
Niagara West MTS						
2508T1, 2508T2		HT 3 ph.	X	X		Power flow direction ULTC tap position ULTC A/M status
2508T1-Q25BM 2508T2-Q23BM					X	
T1B, T2Y, BY, "B" & "Y" Bus		X 3 ph.			X	A/R status
M1, M2, M3, M4, M5, M6	X 3 ph.				X	A/R status

## Schedule E

## CONNECTION INFORMATION

## Niagara West Transformation Corporation

## PART A: Generic Information

[This Information is for use by both the Transmitter and the IMO]

Submission Date		
Identification	Market participant identifier	NWTC
	Facility identifier	NWTC MTS
Service Dates	Initial in-service:	January 30, 2004
	Permanent in-service:	
	Permanent out-of-service:	
<b>**</b> Protection System Description (for Transmitters only)	<p>A functional description of all protective systems shall be provided to allow a detailed analysis of all credible contingencies. These descriptions shall include, but are not limited to, the following:</p> <ul style="list-style-type: none"> <li>Operating times for protection components (e.g. primary relaying, auxiliary relaying, communication),</li> <li>General models for normal and delayed (breaker failure) fault clearing, and</li> <li>Exceptions to the general model (e.g. LEO, HIROP).</li> </ul> <p>For all recognized contingencies, the functional description must enable fault clearing times at all terminals to be determined for both normal and delayed clearing.</p> <p>This Information is required from Generators and connected wholesale Customers only upon request.</p> <p><b>Pen West Utilities and Grimsby Power</b> have constructed the new <b>Niagara West MTS</b>. This facility is a 230-28kV DESN station, designed for operation in a "DESN" station configuration with 2x40/67MVA power transformers. Accordingly, the protection systems are designed for the parallel operation of two incoming 230kV line taps to circuits Q23BM [T2] and Q25BM [T1] via the transformer/28kV bus installations</p> <p>Faults on Niagara West MTS components, which are detected by station protections, are intended to be cleared by station and other interrupting devices. This includes a reliance on Hydro One 230kV line terminal breakers to interrupt faults on the 230kV line, main transformer, and transformer secondary connections. The primary 230kV disconnect switch is used for manual isolation of the main transformer and for backup operation in the event that Hydro One breakers do not successfully clear the fault. Failure of either of the 28kV main breakers or the 28kV tie breaker [coupler] would be detected by "Breaker Failure" protection associated with that device on the basis of elapsed time between trip initiation and a position change of the interrupter/disconnect auxiliary contact. Undercurrent supervision of the Breaker Fail protections will ensure that spurious or inadvertent operation of BF relaying will be minimized.</p> <p>2-channel tone transfer tripping is installed for each of the Hydro One 230kV supply circuits. These will operate in TX mode to clear station faults at high speed [2 channel] or delayed speed [1 channel] at 230kV terminal breakers or RX mode to clear line faults or faults at other tapped stations on the supply circuits.</p> <p>230kV line back up distance and ground fault protection is installed at Niagara West MTS for recognition of 230kV phase and line-ground faults in the event that a faulted 230kV circuit remains energized through the 28kV secondary parallel at the station. These protections monitor CTs and CVTs on the transformer primary bushings.</p> <p>Transformer protections comprise duplicate differential relaying. In addition, A group relaying provides for gas tripping on the transformer main tank and tapchanger compartment; B group provides for transformer 28kV ground back up overcurrent protection.</p> <p>28kV Bus protection is provided by differential overcurrent protection, representing the current summation of all main, tie &amp; feeder breakers connected to the protected 28kV bus. A 28kV bus partial differential [i.e. sum of connected main and tie breaker CTs] operates as timed backup overcurrent protection for detection of phase and ground faults.</p> <p>Underfrequency load shedding [UFLS] has been provided by the 28kV feeder relays to meet the load potential and the frequency response determined by the IMO.</p>	

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Schedule E  
CONNECTION INFORMATION

Parameters and practices for thermal limit calculations	Equipment parameters to enable continuous and limited time ratings to be calculated under prevailing and predicted conditions. All practices that could have a bearing on equipment operation shall be reported. These include but are not (AMPCO) limited to the following: <ul style="list-style-type: none"> <li>ferrous or non-ferrous connectors</li> <li>bolted or not-bolted connections</li> <li>indoor or outdoor locations</li> <li>No 230kV transmission line components are part of the Niagara West MTS facility</li> <li>No ferrous hardware</li> <li>230kV outdoor switchyard connectors are compression fittings or Aluminum weldments</li> <li>28kV switchgear is indoor Gas Insulated Switchgear [GIS] .</li> </ul>	
Relay Information	Settings and characteristics to enable relay margin analysis of credible contingencies  Submission and review of relaying settings to HONI is required as part of the verification process	
Detailed Single-Line	A detailed single-line diagram showing equipment and protection and telemetry points	Attached A/Cad file Dwg NW 100 rev 8
Test Results	Copies of all commission tests to all power system components <ul style="list-style-type: none"> <li>230kV [Manufacturer] type [.....] disconnect switch commissioning results: <i>site activities not complete</i></li> <li>40/67 MVA Power transformer [Pauwels] test results Dec 18, 2003 &amp; xxxx, 2003 and are available as required</li> <li>28kV [Alstom]. GIS switchgear final commissioning test report: <i>complete results are available as required.</i></li> <li>Station commissioning and test report: <i>activities not complete</i></li> </ul>	

\*\* Refer to Schedule E, Part F "Other Data the Customer Must Submit to Transmitter" (Hydro One Networks P&C review of customer TS.)

**Notes:**

- (1) To avoid multiple requests and for administrative efficiency, the Information being collected in this Appendix 1, Schedule E, Parts A through D, is for use by both the Transmitter and the IMO. All tables, in Parts A through D, are consistent with the IMO's Facility Registration Technical Data Forms and applicable Market Rules.
- (2) All Customers are to complete the relevant portions of the following appendices to describe their facilities. Customers also shall provide nameplate data for equipment directly connected to the transmission system upon request.
- (3) Impact Information requirements are intended to describe facilities in enough detail to allow a Connection Agreement to be executed.
- (4) Connection Information requirements are intended to describe facilities in enough detail to allow them to be laced in service.



## Schedule E

## CONNECTION INFORMATION

**PART B: Information Concerning Generation Facilities**

[This Information is for use by both the Transmitter and the IMO]

**\*\*Not Applicable to this Customers Connection \*\***

Unit Data	Identifier						
	Manufacturer						
	Serial Number						
	Type (e.g. salient pole, round rotor, induction)						
	Frequency (Hz)						
	NERC Unit type(e.g. Candu, Steam Turbine, Hydraulic Turbine, Wind Turbine)						
	NERC Status						
	NERC Cooling Water Source						
	NERC Fuel Type (primary, alternate)						
	NERC Fuel Transportation (primary, alternate)						
	NERC Capacity (summer, winter)						
	NERC Primary fuel heat rate at full load (BTU/kWhr)						
	Rated capability (MVA)						
	Rated voltage (kV)						
	Power Factor						
	Total rotational inertia of Generator and turbine (s)						
	Unsaturated reactances in pu on machine base						
	X <sub>d</sub> X'' <sub>d</sub> X <sub>q</sub> X' <sub>q</sub> X <sub>1</sub> X <sub>2</sub> X <sub>0</sub>						
	Open circuit time constraints						
	T' <sub>do</sub> T'' <sub>do</sub> T' <sub>qo</sub> T'' <sub>qo</sub>						
	Speed (RPM)						
	Station load (MW, Mvar)						
	Minimum power (MW)						
	Normal loading and unloading ramp rates (MW/min)						
	Emergency loading and unloading ramp rates (MW/min)						
	Armature (R <sub>a</sub> ) and field resistance (R <sub>fd</sub> ) ( Ω )						
	Saturation at rated voltage (S1.0) and 20% above (S1.2)						
	Rotational inertia for Generator without turbine (s) (required only upon request)						
	Damping						
	Base field current (A)						
	Base field voltage (volts)						
	Losses at 1.0 and 0.9 power factor (MW)						
	Characteristics	Open circuit saturation curve					
Short circuit curve							
V curves							
Capability curve							

\*Field resistance for hydraulic units should be specified at 75°C and at 100°C for thermal units.

## EXCITATION SYSTEM MODEL

A block diagram suitable for stability studies or an IEEE standard model type with all in-service parameter values for the exciter. Models for stabilizers, under-excitation limiters, and over-excitation limiters shall be provided where applicable.	For each unit 10 MVA or larger
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## GOVERNOR AND PRIME MOVER SYSTEM MODEL

A block diagram suitable for stability studies or an IEEE standard model type with all in service parameters values for the governor and prime mover (turbine). More detailed models would be required if off-nominal frequency or shaft torsional studies are required.	For each unit 10 MVA or larger
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E-1-B-1  
Schedule E  
CONNECTION INFORMATION

E-1-C-1  
Schedule E

**CONNECTION INFORMATION**

Part C: Impact Information Concerning Consumer and Distributor Facilities 1

<b>Nature of Load</b>	Composition (e.g. % industrial, % commercial, %residential)	100%		
	Requirement for dual supply	Yes		
	Description of unusual sensitivity to voltage or frequency fluctuations			
	Description of unusual consequences of power outages			
<b>Power Quality</b> (upon special request)	Harmonics (frequency, magnitude)	Upon Request	Upon Request	
	Flicker (voltage change %, frequency Hz)	Upon Request	Upon Request	
	Phase Imbalance (%)	Upon Request		
	Variable Speed Drives	Demand (kVA)	Upon Request	
	[Enter description here; as many lines as necessary]			
	Welding Equipment	Demand (kVA)	Upon Request	
	[Enter description here; as many lines as necessary]			
	Static Converters	Demand (kVA)	Upon Request	
	[Enter description here; as many lines as necessary]			
	Furnace	Demand (kVA)	Upon Request	
	[Enter description here; as many lines as necessary]			
	Other discontinuous or harmonic rich load	Demand (kVA)	Upon Request	
	[Enter description here; as many lines as necessary]			
Capacitors	Demand (kVA)	Upon Request		
[Enter description here; as many lines as necessary]				
Generators	Total Size (kVA)	Upon Request		
[Enter description here; as many lines as necessary]				
<b>Motors</b> (≥ 500 HP)	Type (e.g. squirrel cage, wound rotor, synchronous)	None		
	Rated capability (MVA)	None		
	Rated power factor	None		
	Starting method (e.g. full-voltage, resistive, reduced voltage, delta-wye)	None		
	Starts per day	None		

**Connection**

Load Shape	Hours	November to April (Winter) Maximum Demand				May to October (Summer) Maximum Demand			
		Weekday		Weekend		Weekday		Weekend	
		MW	Mvar	MW	Mvar	MW	Mvar	MW	Mvar
Forecasted data from CCRA, to be updated after station in service for 2 years.	0-4	Assume (H)	Assume (H)	Assume (H)	Assume (H)	Assume (H)	Assume (H)	Assume (H)	Assume (H)
	4-8	Assume (H)	Assume (H)	Assume (H)	Assume (H)	Assume (H)	Assume (H)	Assume (H)	Assume (H)
	8-12	Assume (H)	Assume (H)	Assume (H)	Assume (H)	Assume (H)	Assume (H)	Assume (H)	Assume (H)
	12-16	Assume (H)	Assume (H)	Assume (H)	Assume (H)	Assume (H)	Assume (H)	Assume (H)	Assume (H)
	16-20	Assume (H)	Assume (H)	Assume (H)	Assume (H)	Assume (H)	Assume (H)	Assume (H)	Assume (H)
	20-24	Assume (H)	Assume (H)	Assume (H)	Assume (H)	Assume (H)	Assume (H)	Assume (H)	Assume (H)
<b>Induction Motors</b> ≥ 500 HP	Identifier								None
	Rated capability (MVA or HP)								None
	Rated power factor								None
	Rated torque (per unit on machine base)								None
	Rated slip (per unit on machine base)								None
	Starting torque (per unit on machine base)								None
	Starting current (per unit on machine base)								None
	Starting power factor								None
<b>Synchronous Motors</b> (≥ 500 HP)	Peak torque (per unit on machine base)								None
	Identifier								None
	Rated output (MVA or HP)								None
	X''d (unsaturated subtransient reactance in per-unit on machine base)								None
	Rotational inertia constant H of motor and load (s)								None
	Unsaturated reactances (per unit on machine base)								
	Xd	X'd	X''d	Xq	X'q	X''q	Xl	X2	X9
	None	None	None	None	None	None	None	None	None
	Open circuit time constants (s)				T'do	T''do	T'qo	T''qo	
					None	None	None	None	
Armature resistance (Ra) (per unit on machine base)								None	

**EXCITATION SYSTEM MODEL**

A block diagram suitable for stability studies or an IEEE standard model type with all in-service parameter values for the exciter. Models for stabilizers, under-excitation limiters, and over-excitation limiters shall be provided where applicable. For each synchronous motor 10 MVA or larger	Not applicable
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E-1-C-1  
Schedule E  
CONNECTION INFORMATION

## Niagara West Transformation Corporation

## Transmission Facilities

Network Impact

Niagara West MTS

T1

Transformers				Winding Terminal: (e.g. H, L, T, etc.)		Rated Voltage for each winding (kV)			
				H		215.5			
				L		28/16			
	Cooling Type (eg. ONAN, ONAF, OFAF, SHORT, CONT, etc.)				ONAN	OFAF	OFAF		
	Associated Thermal Rating (MVA/Amps)				50	66.7	83		
	Impedance Test Data		Terminal(s)		Tertiary	Impedance Values			
			Energized	Shorted	Open	Open (O), Closed (C)	R %	X %	MVA Measured
	Positive Sequence		H	L			.37	17.37	66.7
	Zero sequence: (Transformers with 1 or more external neutrals)		H		L		Missing (H)	91.04	40
			H	L			Missing (H)	89.73	40
			L		H		Missing (H)	1.29	40
			L	H			Missing (H)	1.29	40
	Winter (10°C) Continuous, 15 minute and 10 day thermal ratings (MVA)					83	0	100	
	Summer (30°C) Continuous, 15 minute and 10 day thermal ratings (MVA)					83	0	100	
	Tap Terminal	Off-load taps (kV)							
	None								
	H	On-load taps (max tap (kV), min tap (kV), number of steps)					34.5	-34.5	32

## Connection

Transformers	Manufacturer			PAUW	
	Serial Number			97032675	
	Construction (e.g. shell or core)			CORE	
	In-service voltage level of off-load/on-load tap(s) or reconnectable terminal(s) (kV)			None	
	Configuration (e.g. 3 phase or three single phase)			3	
	Temperature rise (°C)			65	
	Winding Terminal	Connection for each winding (e.g. wye, delta, zig-zag)	Impedance to ground for each winding (ohms) (e.g. 16 R) Indicate: U - ungrounded, R - Resistance, X - Reactance		
	H	Y	U		
	L	Z	1.5 X		
	Core Losses (kW) and Excitation Current (Amps)			25.5	1

NR = Not Required

R = Required

S = Supply when available

H = Assume

## Niagara West Transformation Corporation

## Transmission Facilities

Network Impact

Niagara West MTS

T2

Transformers	Winding Terminal: (e.g. H, L, T, etc.)		Rated Voltage for each winding (kV)		
	H		215.5		
	L		28/16		
	Cooling Type (eg. ONAN, ONAF, OFAF, SHORT, CONT, etc.)		ONAN	OFAF	OFAF
	Associated Thermal Rating (MVA/Amps)		40	53.3	66.7
	Impedance Test Data	Terminal(s)		Tertiary	Impedance Values
		Energized	Shorted	Open	MVA Measured
	Positive Sequence	H	L		66.7
	Zero sequence: (Transformers with 1 or more external neutrals)	H		L	Missing (H)
		H	L		Missing (H)
		L		H	Missing (H)
		L	H		Missing (H)
	Winter (10°C) Continuous, 15 minute and 10 day thermal ratings (MVA)		66.7	0	100
	Summer (30°C) Continuous, 15 minute and 10 day thermal ratings (MVA)		66.7	0	100
	Tap Terminal	Off-load taps (kV)			
None					
H	On-load taps (max tap (kV), min tap (kV), number of steps)		34.5	-34.5	

## Connection

Transformers	Manufacturer		PAUW
	Serial Number		97032674A
	Construction (e.g. shell or core)		
	In-service voltage level of off-load/on-load tap(s) or reconnectable terminal(s) (kV)		None
	Configuration (e.g. 3 phase or three single phase)		3
	Temperature rise (°C)		65
	Winding Terminal	Connection for each winding (e.g. wye, delta, zig-zag)	Impedance to ground for each winding (ohms) (e.g. 16 R) Indicate: U - ungrounded, R - Resistance, X - Reactance
	H	Y	U
	L	Z	X
	Core Losses (kW) and Excitation Current (Amps)		26.19

NR = Not Required

R = Required

S = Supply when available

H = Assume

## Niagara West Transformation Corporation

## Transmission Facilities

Connection

Niagara West MTS

T1-G

*Effective:* Fri 06-Feb-2004

Switches	Manufacturer	ALSA
	Serial Number	23906
	Voltage rating (kV)	245
	Type (e.g. disconnect, interrupt)	DIS
	Continuous current rating (amps)	2000
	Short Circuit Rating (kA)	63

NR = Not Required

R = Required

S = Supply when available

H = Assume

## Niagara West Transformation Corporation

## Transmission Facilities

Connection

Niagara West MTS

T1-Q25BM

*Effective:* Fri 06-Feb-2004

Switches	Manufacturer	ALSA
	Serial Number	23904
	Voltage rating (kV)	245
	Type (e.g. disconnect, interrupt)	DIS
	Continuous current rating (amps)	2000
	Short Circuit Rating (kA)	63

NR = Not Required

R = Required

S = Supply when available

H = Assume



## Niagara West Transformation Corporation

## Transmission Facilities

Connection

Niagara West MTS

T2-G

*Effective:* Fri 06-Feb-2004

Switches	Manufacturer	ALSA
	Serial Number	23907
	Voltage rating (kV)	245
	Type (e.g. disconnect, interrupt)	DIS
	Continuous current rating (amps)	2000
	Short Circuit Rating (kA)	63

NR = Not Required

R = Required

S = Supply when available

H = Assume

## Niagara West Transformation Corporation

## Transmission Facilities

Connection

Niagara West MTS

T2-Q23BM

*Effective:* Fri 06-Feb-2004

Switches	Manufacturer	ALSA
	Serial Number	23905
	Voltage rating (kV)	245
	Type (e.g. disconnect, interrupt)	DIS
	Continuous current rating (amps)	2000
	Short Circuit Rating (kA)	63

NR = Not Required

R = Required

S = Supply when available

H = Assume

E--D-SA-1

## Niagara West Transformation Corporation

### Transmission Facilities

Connection

Niagara West MTS

T1SA1B

Surge Arresters	Manufacturer	NEW
	Serial Number	2508T1SA1B
	Voltage rating (kV)	258
	Type (e.g. ZnO, SiC)	ZnO
	Class (e.g. secondary, distribution, intermediate, station)	NR

NR = Not Required

R = Required

S = Supply when available

H = Assume

## Niagara West Transformation Corporation

## Transmission Facilities

Connection

Niagara West MTS

T1SA1R

Surge Arresters	Manufacturer	NEW
	Serial Number	2508T1SA1R
	Voltage rating (kV)	258
	Type (e.g. ZnO, SiC)	ZnO
	Class (e.g. secondary, distribution, intermediate, station)	NR

NR = Not Required

R = Required

S = Supply when available

H = Assume

## Niagara West Transformation Corporation

## Transmission Facilities

Connection

Niagara West MTS

T1SA1W

Surge Arresters	Manufacturer	NEW
	Serial Number	2508T1SA1W
	Voltage rating (kV)	258
	Type (e.g. ZnO, SiC)	ZnO
	Class (e.g. secondary, distribution, intermediate, station)	NR

NR = Not Required

R = Required

S = Supply when available

H = Assume

## Niagara West Transformation Corporation

## Transmission Facilities

Connection

Niagara West MTS

T1SA2B

Surge Arresters	Manufacturer	NEW
	Serial Number	2508T1SA2B
	Voltage rating (kV)	21
	Type (e.g. ZnO, SiC)	ZnO
	Class (e.g. secondary, distribution, intermediate, station)	NR

NR = Not Required

R = Required

S = Supply when available

H = Assume

## Niagara West Transformation Corporation

## Transmission Facilities

Connection

Niagara West MTS

T1SA2R

Surge Arresters	Manufacturer	NEW
	Serial Number	2508T1SA2R
	Voltage rating (kV)	21
	Type (e.g. ZnO, SiC)	ZnO
	Class (e.g. secondary, distribution, intermediate, station)	NR

NR = Not Required

R = Required

S = Supply when available

H = Assume

## Niagara West Transformation Corporation

## Transmission Facilities

Connection

Niagara West MTS

T1SA2W

Surge Arresters	Manufacturer	NEW
	Serial Number	2508T1SA2W
	Voltage rating (kV)	21
	Type (e.g. ZnO, SiC)	ZnO
	Class (e.g. secondary, distribution, intermediate, station)	NR

NR = Not Required

R = Required

S = Supply when available

H = Assume



## Niagara West Transformation Corporation

## Transmission Facilities

Connection

Niagara West MTS

T2SA1B

Surge Arresters	Manufacturer	NEW
	Serial Number	2508T2SA1B
	Voltage rating (kV)	258
	Type (e.g. ZnO, SiC)	ZnO
	Class (e.g. secondary, distribution, intermediate, station)	NR

NR = Not Required

R = Required

S = Supply when available

H = Assume

## Niagara West Transformation Corporation

## Transmission Facilities

Connection

Niagara West MTS

T2SA1R

Surge Arresters	Manufacturer	NEW
	Serial Number	2508T2SA1R
	Voltage rating (kV)	258
	Type (e.g. ZnO, SiC)	ZnO
	Class (e.g. secondary, distribution, intermediate, station)	NR

NR = Not Required

R = Required

S = Supply when available

H = Assume

# Niagara West Transformation Corporation

## Transmission Facilities

Connection

Niagara West MTS

T2SA1W

Surge Arresters	Manufacturer	NEW
	Serial Number	2508T2SA1W
	Voltage rating (kV)	258
	Type (e.g. ZnO, SiC)	ZnO
	Class (e.g. secondary, distribution, intermediate, station)	NR

NR = Not Required

R = Required

S = Supply when available

H = Assume

## Niagara West Transformation Corporation

## Transmission Facilities

Connection

Niagara West MTS

T2SA2B

Surge Arresters	Manufacturer	NEW
	Serial Number	2508T2SA2W
	Voltage rating (kV)	21
	Type (e.g. ZnO, SiC)	ZnO
	Class (e.g. secondary, distribution, intermediate, station)	NR

NR = Not Required

R = Required

S = Supply when available

H = Assume

**Niagara West Transformation Corporation****Transmission Facilities**

Connection

**Niagara West MTS****T2SA2R**

Surge Arresters	Manufacturer	NEW
	Serial Number	2508T2SA2R
	Voltage rating (kV)	21
	Type (e.g. ZnO, SiC)	ZnO
	Class (e.g. secondary, distribution, intermediate, station)	NR

NR = Not Required

R = Required

S = Supply when available

H = Assume

## Niagara West Transformation Corporation

## Transmission Facilities

Connection

Niagara West MTS

T2SA2W

Surge Arresters	Manufacturer	NEW
	Serial Number	2508T2SA2B
	Voltage rating (kV)	21
	Type (e.g. ZnO, SiC)	ZnO
	Class (e.g. secondary, distribution, intermediate, station)	NR

NR = Not Required

R = Required

S = Supply when available

H = Assume

## Niagara West Transformation Corporation

## Transmission Facilities

Network Impact

Niagara West MTS

BY

*Effective:* Fri 06-Feb-2004

Circuit Breakers	Rated Voltage (kV)	34.5
	Interrupting Time (ms)	90
	Interrupting Media (e.g. air, oil, SF6)	VACUUM
	Rated continuous current (A)	2000
	Rated Symmetrical Short Circuit Capability (kA)	16 kA

## Connection

Circuit Breakers	Manufacturer	ALSA
	Serial Number	PSDB-NIAGARA W 03

NR = Not Required

R = Required

S = Supply when available

H = Assume

## Niagara West Transformation Corporation

## Transmission Facilities

Network Impact

Niagara West MTS

M1

*Effective:* Fri 06-Feb-2004

Circuit Breakers	Rated Voltage (kV)	34.5
	Interrupting Time (ms)	90
	Interrupting Media (e.g. air, oil, SF6)	VACUUM
	Rated continuous current (A)	1200
	Rated Symmetrical Short Circuit Capability (kA)	16 kA

## Connection

Circuit Breakers	Manufacturer	ALSA
	Serial Number	PSDB-NIAGARA W 04

NR = Not Required

R = Required

S = Supply when available

H = Assume



## Niagara West Transformation Corporation

## Transmission Facilities

Network Impact

Niagara West MTS

M2

*Effective:* Fri 06-Feb-2004

Circuit Breakers	Rated Voltage (kV)	34.5
	Interrupting Time (ms)	90
	Interrupting Media (e.g. air, oil, SF6)	VACUUM
	Rated continuous current (A)	1200
	Rated Symmetrical Short Circuit Capability (kA)	16 kA

## Connection

Circuit Breakers	Manufacturer	ALSA
	Serial Number	PSDB-NIAGARA W 05

NR = Not Required

R = Required

S = Supply when available

H = Assume

## Niagara West Transformation Corporation

## Transmission Facilities

Network Impact

Niagara West MTS

M3

*Effective:* Fri 06-Feb-2004

Circuit Breakers	Rated Voltage (kV)	34.5
	Interrupting Time (ms)	90
	Interrupting Media (e.g. air, oil, SF6)	VACUUM
	Rated continuous current (A)	1200
	Rated Symmetrical Short Circuit Capability (kA)	16 kA

## Connection

Circuit Breakers	Manufacturer	ALSA
	Serial Number	PSDB-NIAGARA W 06

NR = Not Required

R = Required

S = Supply when available

H = Assume

## Niagara West Transformation Corporation

## Transmission Facilities

Network Impact

Niagara West MTS

M4

*Effective:* Fri 06-Feb-2004

Circuit Breakers	Rated Voltage (kV)	34.5
	Interrupting Time (ms)	90
	Interrupting Media (e.g. air, oil, SF6)	VACUUM
	Rated continuous current (A)	1200
	Rated Symmetrical Short Circuit Capability (kA)	16 kA

## Connection

Circuit Breakers	Manufacturer	ALSA
	Serial Number	PSDB-NIAGARA W 07

NR = Not Required

R = Required

S = Supply when available

H = Assume

## Niagara West Transformation Corporation

## Transmission Facilities

Network Impact

Niagara West MTS

M5

*Effective:* Fri 06-Feb-2004

Circuit Breakers	Rated Voltage (kV)	34.5
	Interrupting Time (ms)	90
	Interrupting Media (e.g. air, oil, SF6)	VACUUM
	Rated continuous current (A)	1200
	Rated Symmetrical Short Circuit Capability (kA)	16 kA

## Connection

Circuit Breakers	Manufacturer	ALSA
	Serial Number	PSDB-NIAGARA W 08

NR = Not Required

R = Required

S = Supply when available

H = Assume

## Niagara West Transformation Corporation

## Transmission Facilities

Network Impact

Niagara West MTS

M6

*Effective:* Fri 06-Feb-2004

Circuit Breakers	Rated Voltage (kV)	34.5
	Interrupting Time (ms)	90
	Interrupting Media (e.g. air, oil, SF6)	VACUUM
	Rated continuous current (A)	1200
	Rated Symmetrical Short Circuit Capability (kA)	16 kA

## Connection

Circuit Breakers	Manufacturer	ALSA
	Serial Number	PSDB-NIAGARA W 09

NR = Not Required

R = Required

S = Supply when available

H = Assume

## Niagara West Transformation Corporation

## Transmission Facilities

Network Impact

Niagara West MTS

T1B

*Effective:* Fri 06-Feb-2004

Circuit Breakers	Rated Voltage (kV)	34.5
	Interrupting Time (ms)	90
	Interrupting Media (e.g. air, oil, SF6)	VACUUM
	Rated continuous current (A)	2000
	Rated Symmetrical Short Circuit Capability (kA)	16 kA

## Connection

Circuit Breakers	Manufacturer	ALSA
	Serial Number	PSDB-NIAGARA W 01

NR = Not Required

R = Required

S = Supply when available

H = Assume

## Niagara West Transformation Corporation

## Transmission Facilities

Network Impact

Niagara West MTS

T2Y

*Effective:* Fri 06-Feb-2004

Circuit Breakers	Rated Voltage (kV)	34.5
	Interrupting Time (ms)	90
	Interrupting Media (e.g. air, oil, SF <sub>6</sub> )	VACUUM
	Rated continuous current (A)	2000
	Rated Symmetrical Short Circuit Capability (kA)	16 kA

## Connection

Circuit Breakers	Manufacturer	ALSA
	Serial Number	PSDB-NIAGARA W 02

NR = Not Required

R = Required

S = Supply when available

H = Assume





E-1-F-1  
Schedule E  
CONNECTION INFORMATION

**PART F: Other Data that the Customer must Submit to Transmitter.**

1) Customer Protection and Control Information

<u>Equipment Registry Information</u>	<u>NS – TS- P&amp;C</u>
1. Operating diagram with ownership markings	✓
2. Single line diagram included, showing all protections (3 wire diagram acceptable) <b>“Need Protections”</b>	✓
3. Power transformer nameplate data	✓
4. Relay settings & verification tests (Schedule E, Part A Generic Info),	✓
5. HV equipment operating & protection philosophy that are impactive on HONI system	✓
6. Tripping Matrix (statements) for protections that are imperative on HONI System	✓

“R” = Required

**Notes: Documents Submitted by Customer**

1. Niagara Transformer Station – Station Single Line Diagram – Niagara West Transformation Corporation, Elecsar Engineering Limited, Drawing Number – NW1-100 Rev 8 dated: 05.09.2002.
2. Niagara West Transformer Station, Niagara West Transformation Corporation, Elecsar Engineering Limited – Differential Protection Group “A” Transformer 1 Relay GE UR T60 – DC Schematic Drawing Number NW1-116 Rev 2 dated: 24.09.2002.
3. Niagara West Transformer Station, Niagara West Transformation Corporation, Elecsar Engineering Limited, -Differential Protection Group “A” Transformer 2

Schedule E

CONNECTION INFORMATION

Relay GE UR T60-AC Schematic Drawing Number NW1-116 Revision 2 dated:  
27.09.2002.

4. Niagara West Transformer Station, Niagara West Transformation Corporation,  
Elecsar Engineering Limited, - Differential Protection Transformer 2 – Relay GE UR  
T60 – DC Schematic Drawing Number NW1-118 Rev 2 dated: 24.09.2002.
5. Niagara West Transformer Station, Niagara West Transformation Corporation,  
Elecsar Engineering Limited, - Differential Protection Group “B” Transformer 1 –  
Relay SEL 387A – AC Schematic Drawing Number NW1-119 Rev 2 – 24.09.2002.
6. Niagara West Transformer Station, Niagara West transformation Corporation, Elecsar  
Engineering Limited, - Differential Protection B – Transformer 1 Relay SEL 387A –  
DC Schematic, Drawing Number NW1-120 Rev 3 dated: 24.09.2002.
7. Niagara West Transformer Station, Niagara West Transformation Corporation,  
Elecsar Engineering Limited, - Distance Protection 230kV Line 1 Relay GE UR D30-  
AC Schematic, Drawing Number NW1-111 Rev 2 dated: 24.09.2002.
8. Niagara West Transformer Station, Niagara West Transformation Corporation,  
Elecsar Engineering Limited, Distance Protection – 230KkV Line 1 Relay GE UR  
D30-DC Schematic Drawing Number NW1-112 Rev 3 dated:24.09.2002.
9. Niagara West Transformer Station, Niagara West Transformation Corporation,  
Elecsar Engineering Limited, - Distance Protection –230kV Line 2 Relay GE UR  
D30 Ac Schematic, Drawing Number NW1-113, Rev 3 dated: 24.09.2002.
10. Niagara West Transformer Station, Niagara West Transformation Corporation,  
Elecsar Engineering Limited, Distance Protection – 230kV Line 2 Relay GE UR D30  
DC Schematic, Drawing Number NW1-114 Rev 3 dated: 24.09.2002

## Schedule E

## CONNECTION INFORMATION

11. Niagara West Transformer Station, , Niagara West Transformation Corporation,  
Elecsar Engineering Limited, Differential Protection Group "A" Transformer 1 Relay  
GE UR T60 – AC Schematic Drawing Number NW1-115 Rev 2 27.09.2002
12. Niagara West Transformer Station, Niagara West Transformation Corporation,  
Elecsar Engineering Limited, Station Single Line Diagram, Drawing Number NW1-  
100 Rev 8 dated: 05.09.2002.
13. Niagara West Transformer Station, Niagara West Transformation Corporation,  
Elecsar Engineering Limited, Disconnect Switch 230 kV Line 1 Schematic Drawing  
Number NW1-107 Rev 3 dated: 24.09.2002.
14. Niagara West Transformer Station, Niagara West Transformation Corporation,  
Elecsar Engineering Limited, 230 kV Line 2 Schematic Drawing Number NW1-108  
Rev 3 24.09.2002.
15. Niagara West Transformer Station, Niagara West Transformation Corporation,  
Elecsar Engineering Limited, - Protection NSD 70 ABB Q25 BM-Line 1 Drawing  
Number NW1-109 Rev 4 dated: 24.09.2002.
16. Niagara West Transformer Station, Niagara West Transformation Corporation,  
Elecsar Engineering Limited, - Transfer Trip – Protection NSD 70 ABB –Q23BM –  
Line 2 Drawing Number NW1-110 Rev 4 dated: 24.09.2002.
17. Niagara West Transformer Station, Niagara West Transformation Corporation,  
Elecsar Engineering Limited, Station Single Line Diagram Drawing Number NW1-  
100 Rev 7, dated: 05.09.2002.

E-1-F-4  
Schedule E  
CONNECTION INFORMATION

## SCHEDULE F

### GENERAL TECHNICAL REQUIREMENTS

#### 1.1. Guidelines of Reliability Organizations

- 1.1.1. Customers and Transmitters shall follow all reliability organizations' standards as they may be amended from time to time.
- 1.1.2. The Transmitter shall provide to Customers upon request, the address and contact persons at the relevant reliability organization.

#### 1.2. Isolation from the Transmission System

- 1.2.1. The Customer shall provide an isolating disconnect switch or device at the point or junction between the Transmitter and the Customer i.e. at the point of the interconnection, which physically and visually opens the main current-carrying path and isolates the Customer's facility from the transmission system..
- 1.2.2. The isolating disconnect switch shall meet the following criteria:
  - 1.2.2.1. it shall simultaneously open all phases to the connection;
  - 1.2.2.2. it shall be lockable in the open and closed positions;
  - 1.2.2.3. it shall be operated only upon prior notice to either Party, unless an emergency requires it to be open;
  - 1.2.2.4. when the device is used as part of the HVI failure protection system, it shall be motor-operated and equipped with appropriate control circuitry; and
  - 1.2.2.5. it shall be suitable for safe operation under the conditions of use.
- 1.2.3. With advance notice to the Customer, the Transmitter's personnel may lock the isolating disconnect switch in the open position:
  - 1.2.3.1. if it is necessary to protect the Transmitter's maintenance staff and the Transmitter received a condition guarantee from the Customer. The lock, during the condition guarantee, shall be under the control of the Transmitter's operator;
  - 1.2.3.2. if the operation of the Customer's facility presents a safety hazard to the Transmitter's personnel or equipment;
  - 1.2.3.3. if operation of the Transmitter's equipment interferes with the Customer's equipment;
  - 1.2.3.4. if equipment owned by either Party interferes with the operation of the transmission system; or
  - 1.2.3.5. as directed by the IMO.

### 1.3. Protection and Control

- 1.3.1. The protection systems, which protects transmission system elements, shall be capable of minimizing the severity and extent of disturbances to the transmission system while themselves experiencing a first-order single contingency such as the failure of a relay protection system to operate or the failure of a breaker to trip. In particular:
  - 1.3.1.1. the elements designated by the Transmitter as essential to system reliability and security shall be protected by two protection systems. Each system shall be independently capable of detecting and isolating all faults on those elements. These elements shall have breaker failure protection, but breaker failure protection need not be duplicated. Both protection systems shall initiate breaker failure protection;
  - 1.3.1.2. to reduce the risk of both systems being disabled simultaneously by a single contingency, the protection system designs shall not use components common to the two systems;
  - 1.3.1.3. the use of two identical protection systems is not generally, recommended, because it increases the risk of simultaneous failure of both systems due to design deficiencies or equipment problems;
  - 1.3.1.4. the protection systems shall be designed to isolate only the faulted element. For faults outside the protected zone, each protection system shall be designed either not to operate or to operate selectively in coordination with other protection systems;
  - 1.3.1.5. Customer protection settings for protections affected by conditions on the transmission system shall be coordinated with those of the transmission system;
  - 1.3.1.6. protection systems shall not operate to trip for stable power swings following contingencies that are judged by protection system designers as not harmful to the transmission system or its Customers;
  - 1.3.1.7. the components and software used in all protection systems shall be of proven quality for effective utility application and following good utility practice;;
  - 1.3.1.8. critical features associated with the operability of protection systems and the high voltage interrupting device (HVI) shall be annunciated or monitored;
  - 1.3.1.9. the design of protection systems shall facilitate periodic testing and maintenance. Test facilities and procedures shall not compromise the independence of the redundant protection systems. Test switches shall be used to eliminate the need to disconnect wires during testing;
  - 1.3.1.10. The two protection systems shall be supplied from separate secondary windings on one voltage transformer or potential device and from separate current transformer secondary windings i.e. from two separate current transformers ;
  - 1.3.1.11. Separately fused and monitored DC sources shall be used with the two protection systems. For all generating Facilities connected to the transmission system, two separate DC station battery banks shall be required to provide the required degree of reliability;
  - 1.3.1.12. Protection system circuitry and physical arrangements shall be designed to minimize the possibility of incorrect operations from personnel error;

- 1.3.2. Specific protection and control practices and equipment requirements are set out in Schedule I of this Agreement.
- 1.3.3. Transmitters and Customers should apply protection systems, using the typical tripping matrix for transmission system protection shown in Exhibit F.2, of this Schedule F. It is a simplified tripping-matrix representation showing the breakers that trip for different protection systems on the transmission system based on a single-line supply to a Customer station or a transmitter's tapped transformers stations operating above 50kV.

#### **1.4. Insulation Coordination**

- 1.4.1. Equipment connected to the transmission system shall be protected against lightning and switching surges. This shall include station shielding against direct lightning strokes, surge protection on all wound devices, and cable/overhead interfaces.
- 1.4.2. A tap connected to a shielded transmission circuit shall also be shielded.
- 1.4.3. The Transmitter shall review surge arrester ratings:
  - 1.4.3.1. the Transmitter shall provide all relevant Information, e.g. ratings, to Customers upon request. The Transmitter, however is not responsible for the adequacy of design or correctness of the operation of any equipment or apparatus including the surge arrester(s).

#### **1.5. Grounding**

- 1.5.1. Grounding installations shall be capable of carrying the maximum foreseeable fault current, for the duration of such fault currents, without risking safety to personnel that may be present on site when a fault occurs, damage to equipment, or interference with the operation of the transmission system.
- 1.5.2. Each transformer, switching, or generating station shall have a ground grid on which all metallic structures, metallic equipment and non-energized metallic equipment are solidly connected. The size, type and requirements for the ground grid are site-specific, depending on such factors as soil conditions, station size, and short-circuit level.
- 1.5.3. The Transmitter shall review the ground potential rise (GPR) study submitted by the Customer at the Customer's cost. The Customer shall comply with the Bell System Practices as they may be amended or modified from time to time and the IEEE standard 487 as it may be amended or modified from time to time for providing special high-voltage protection devices on metallic communication cables. The Transmitter assumes no responsibility for the adequacy of design or correctness of the operation of any equipment or apparatus associated with the Customer's installation.
- 1.5.4. The placement of any additional grounding points on the transmission system shall require the approval of the Transmitter. The Transmitter shall give its approval if it is satisfied that the reliability of its transmission system is not affected.

#### **1.6. Telemetry, Monitoring, and Telecommunications**

- 1.6.1. Transmitters shall advise Customers of the performance and details of required telemetering facilities that serve them. Some requirements depend on the size and specific location of the connection to the transmission system. As a minimum, telemetry shall be required for the flow of real and reactive power through circuits and transformers, the voltages at selected points, and the status (open or closed) of switching elements.

- 1.6.2. A Transmitter may require a Customer to install monitoring equipment to track the performance of its facilities, identify possible protection system problems, and provide measurements of power quality. As required, the monitoring equipment shall perform one or several of the following functions:
  - 1.6.2.1. sequence of events recording (SER) to record protection related events at a connection;
  - 1.6.2.2. digital fault recording (DFR) to permit analysis of transmission system performance under normal and abnormal conditions; or
  - 1.6.2.3. power quality monitoring (PQM) to record voltage transient surges, voltage sags and swells, voltage unbalance, supply interruptions, frequency variations and other voltage and current waveform monitoring;
- 1.6.3. Customers' telecommunications facilities shall be compatible with those of the Transmitter and have similar reliability and performance characteristics. At the Transmitter's discretion, some or all of the following functions may require telecommunication: protective relaying; system control and data acquisition (SCADA); voice communication; and special protection systems (e.g. generation rejection or runback).
- 1.6.4. Telecommunication facilities, design details, and performance requirements, associated with Customers' facilities, shall be provided at the Customer's expense.
- 1.6.5. The Customer shall bear all costs, without limitation, of providing all required telemetry data, associated with its facilities, to the Transmitter and providing all required connection inputs to the Transmitter's disturbance-monitoring equipment.

## 1.7. Inspecting and Commissioning Procedures

- 1.7.1. Customers shall ensure that any new or replacement equipment that they own is inspected and tested before initial connection to the transmission system. The initial verification tests shall confirm that the connection of the Customer's facility to the transmission system:
  - 1.7.1.1. does not pose any safety hazards;
  - 1.7.1.2. does not adversely affect operation of the transmission system in a material manner;
  - 1.7.1.3. does not violate any requirement of the Code or this Agreement.
- 1.7.2. The Transmitter has the right to inspect the Customer's facility and witness commissioning tests related to any new or replacement equipment that could reasonably be expected to adversely affect the transmission system. The initial verification shall include high-voltage interrupting devices, line disconnect switches, the line and bus connections from the dead-end structure to Customer's facility, power transformers, surge arresters, DC batteries, and station service systems, protection, metering, and communication systems. The Customer shall have the right to the inspection reports relating to such facility.
- 1.7.3. The Transmitter assumes no responsibility for the adequacy of design or correctness of the operation of any equipment or apparatus associated with the Customer's installation. The Transmitter shall notify the Customer of its findings regarding any potential problems or limitation of such equipment or apparatus owned by the Customer, without any responsibility.
- 1.7.4. The Customer shall advise the Transmitter of the commissioning program in writing, thirty business days before it proposes to begin the commissioning tests. The written notice shall include the connection



commissioning schedule, the proposed test procedure, the test equipment to be used, and the transmission system conditions required, and also the name of the individual responsible for coordinating the proposed tests on the Customer's behalf.

1.7.5. Within fifteen business days of receiving the notice, the Transmitter shall notify the Customer that it:

1.7.5.1. agrees with the proposed connection commissioning program and test procedures; or

1.7.5.2. requires changes in the interest of safety or maintaining the reliability of the transmission system, and that such changes shall be sent to the Customer promptly.

1.7.6. If the Transmitter requires changes, then the Parties shall act in good faith to reach agreement and finalize the commissioning program within a reasonable period.

1.7.7. The Customer shall submit the results of the commissioning tests to the Transmitter and must demonstrate that all its equipment complies with the Code and this Agreement.

1.7.8. If the commissioning test reveals non-compliance with one or more requirements of the Code or this Agreement, the Customer whose equipment was tested shall promptly meet with the Transmitter and agree on a process aimed at achieving compliance.

1.7.9. The Transmitter may withhold permission to complete the commissioning and subsequent connection of the Customer to the transmission system if the relevant equipment fails to meet any technical requirement stipulated in the Code or this Agreement.

1.7.10. All reasonable costs incurred or associated with Transmitter's witnessing of the verification tests shall be borne by the Customer.

## **1.8. Procedures for Maintenance and Periodic Verification**

1.8.1. The Transmitter may at its sole discretion specify the maintenance criteria and the maximum time intervals between verification cycles for those parts of Customers' facilities that may materially adversely affect the transmission system. The obligations for maintenance and performance re-verification shall be stipulated in the appropriate schedule to this Agreement.

1.8.2. Test switches shall be provided to isolate current and potential transformer input to the relays as well as a set of switches to isolate the relays tripping outputs from the power equipment control circuitry.

1.8.3. The reasonable cost of conducting maintenance and verification tests shall be borne by the Customer.

1.8.4. The Transmitter may appoint a representative to witness relevant maintenance and verification tests and the Customer shall permit the representative to be present while those tests are being conducted.

1.8.5. To ensure that the Transmitter's representative can witness the relevant tests, the Customer shall submit the proposed test procedures and a test schedule to the Transmitter not less than ten business days before it proposes to carry out the test. Following receipt of the request, the Transmitter may delay for technical reasons the testing for as long as ten business days.







1.8.6. The reasonable costs associated with the witnessing of verification tests by the Transmitter's representative shall be borne by the Customer.

- 1.8.7. If a verification test reveals that the electrical equipment or protective relay system covered under the operations schedule does not comply with requirements, the Customer shall:
  - 1.8.7.1. promptly notify the Transmitter of that fact;
  - 1.8.7.2. promptly advise the Transmitter of its proposed remedial steps and its timetable for their implementation;
  - 1.8.7.3. diligently undertake appropriate remedial work and provide the Transmitter with monthly reports on progress; and
  - 1.8.7.4. conduct further tests or monitoring on completing the remedial work, to confirm compliance with the relevant technical requirements.
- 1.8.8. The Transmitter's reasonable costs associated with witnessing the performance tests following remedial work shall be borne by the Customer.
- 1.8.9. Customers shall make their maintenance records and verification test results, including up-to-date as-built drawings, available to the Transmitter upon request.

## SCHEDULE F (CONT'D)

### Exhibit F.1 Protection System Symbols and Devices

#### Protection Systems - Symbols and Device Functions

51B	Transformer Phase Backup
50 / 51	Instantaneous / Timed Overcurrent
51V	Voltage Controlled Overcurrent
64	Line Ground Protection
79-25	Synchronizing Relay
A21 / B21	Line Phase Protection - A&B Group
A27 / B27	Undervoltage - A&B Group
A59 / B59	Overvoltage - A&B Group
A64-27 / B64-27	Ground Undervoltage - A&B Group
A64-59 / B64-59	Ground Overvoltage - A&B Group
A81U / B81U	Underfrequency - A&B Group
A81O / B81O	Overfrequency - A&B Group
A87 / B87	Transformer Differential - A&B Group
F	Failure Protection
L1, L2	Supply Line
T1, T2	Power Transformer
RT/TT	Remote or Transfer Trip for HVI Device Failure Protection
	Circuit Breaker
	Circuit Breaker with Reclosure
	HV Interrupting Device
	a) Circuit Breaker
	b) Circuit Switcher
	c) Vacuum Interrupter
	Motor Operated Disconnect Switch
	HV Transformer Bushing
	LV Transformer Bushing

## SCHEDULE F (CONT'D)

### Exhibit F.2 Typical Transmission System Protection Tripping Matrix

The following is a simplified tripping matrix showing the breakers that trip for different protection systems on the transmission system based on a single line supply to a Customer station or a transmitter's tapped transformer station operating, at the high voltage side, above 50 kV 50kV. The type of Customer (i.e. load or Generator) station configuration and other site-specific factors will influence the desired tripping matrix. The same approach can be applied to large 44-kV developments. In some applications, it may be desirable to trip the MV breaker for Line ZI/T operations instead of the HV Breaker.

PROTECTION FUNCTION	INITIATING PROTECTION							
	LINE ZI	LINE ZT	TTR LOCAL	XFR M	BUS	B/F HV	FRAM E LEAK *	B/F MV
TRIP HV BREAKERS	T	T		T	T	T	T	T
HV BREAKER FAILURE	I	I		I	I			
HV AUTO-RECLOSE	C	C		C	C	C	C	C
TRIP MV BREAKERS			T	T	T	T	T	T
MV BREAKER FAILURE			I	I	I		I	
MV AUTO-RECLOSE					C	C	C	C
TTT	S					S	S	
OPEN XFR DISC				I				
TRIP ADJACENT HV ZONES						I		
TRIP ADJACENT MV ZONES								I

T – trip breakers

I – initiate

C – cancel

S – send signal

HV – high voltage

TTR/T – transfer trip receive/transmit

ZI/T – impedance instantaneous/timed

B/F – breaker failure

MV – medium voltage

\* - Frame leakage protection is normally associated with 500kV breakers

All transmission system elements, including breakers, in the zones of protection shall be fitted with redundant protection systems if devices operated at more than 50 kV, except as noted.

All breakers in the zone of protection that includes devices operated at more than 50 kV shall be fitted with the non-redundant breaker failure-protection systems. Transmission system reliability, as determined by the IMO, may require breaker failure protection on the transformer MV breaker.

The Customer must be able to isolate (self-contain) his internal problems without having a major impact on the transmission system. Under certain circumstances, HV breakers may not be required for load Customer step-down transformers, provided that a motorized disconnect switch and redundant communication channels and paths are provided to isolate the transformer at the terminal stations if a fault occurs in the transformer zone of protection.

Medium-voltage buses require either duplicated differential protection or a single differential protection with an overcurrent backup.

## **SCHEDULE G**

### **TECHNICAL REQUIREMENTS FOR GENERATORS**

#### **1.1. Supply Considerations**

- 1.1.1. A high-voltage interrupting device (HVI) shall provide a point of isolation for the Generator's station from the transmission system. HVIs shall be provided with appropriate back-up protection. The HVI shall be a circuit breaker unless the Transmitter authorizes another device.
- 1.1.2. The HV side of the Generator's transformer shall be protected by surge arresters.
- 1.1.3. All protection systems shall be redundant and be complete with separate trip auxiliary relays and separately fused DC supplies.
- 1.1.4. The standard transformer winding connection for large Generators is LV delta – HV wye. Any other winding connections shall require the approval of the Transmitter. The Transmitter shall give its approval if it is satisfied that the reliability of its transmission system is not affected.
- 1.1.5. The method of grounding the neutral of all power transformer primary windings shall require the approval of the Transmitter. The Transmitter shall give its approval if it is satisfied that the reliability of its transmission system is not affected.

#### **1.2. Typical Generator Protection**

- 1.2.1. The typical technical requirements for Generator protection should be followed, as set out in Exhibit F.1 of Schedule F and Exhibits G.1 and G.2 of this Schedule G.
- 1.2.2. The typical Generator protections used are shown in Exhibit G.3 of this Schedule G.

#### **1.3. Protection against Internal Faults**

- 1.3.1. The Generator shall provide a protection package to detect and isolate faults on its equipment as required by the Transmitter to respect the stability and reliability of the transmission system, equipment ratings, and safety requirements.
- 1.3.2. Transmission system reliability may require two transformer differential protections (A87, B87) and low-voltage breaker failure protection, as shown in Exhibit G.2 of this Schedule G.
- 1.3.3. When two transformer differential protections are not required, one transformer differential and one overcurrent protection shall suffice. The timing of this overcurrent protection shall not exceed 1.6 seconds. The Customer shall coordinate all its internal overcurrent protections.

#### **1.4. Protection against External Faults**

- 1.4.1. The technique used for ground detection varies according to and depends on the type of winding configuration chosen for the power transformer.

- 1.4.1.1. if the transformer is connected ungrounded wye or delta on the primary, then ground undervoltage (64-27) and ground overvoltage (64-59) protections as shown in Appendix 11 are required to detect ground faults.
- 1.4.1.2. where the Transmitter has accepted a solidly grounded wye connection on the primary (Yg/D or Yg/Yg), ground overcurrent (64) protection(s) in the transformer neutral may be used to detect ground faults, as shown in Exhibit H.2 of Schedule H.
- 1.4.2. Typical protections that may be installed are: Distance Instantaneous and Timed (21), Phase Directional Overcurrent (67), Voltage Restrained Overcurrent (51V), Overcurrent (50/51), and Undervoltage (27), as shown in Exhibits G.1 and G.2 of this Schedule G.
- 1.4.3. To provide reliable phase-fault detection, the timed distance protection shall overreach the apparent impedance of the transmission line.
- 1.4.4. A remote/transfer trip system may be required to trip one or more breakers at the Generator's station or to trip breakers at a remote station.
  - 1.4.4.1. generator protections that initiate opening of the remote supply breakers on the transmission system shall at the same time initiate opening of the main transformer high-voltage disconnect switch or line disconnect switch.
  - 1.4.4.2. a signal that opens remote breakers on the transmission system shall be automatically removed when the main transformer disconnect switch or line disconnect switch opens. The signal shall only "seal-in" if the disconnect switch fails to open.
  - 1.4.4.3. for DC remote tripping or transfer tripping, Generators shall provide all necessary equipment associated with two monitored teleprotection channels of adequate conductance between the Customer's station and one of the Transmitter's terminal stations or tapped stations. Normally two circuits in the same cable would be acceptable, but to satisfy transmission system requirements, two separate cables following separate routes may be required. Generators shall use relays and associated equipment following good utility practice guidelines and are compatible with the Transmitter's remote trip or transfer trip equipment.
- 1.4.5. The protective setting to detect islanding/abnormal condition for smaller Generators shall be different from that used for larger Generators.
  - 1.4.5.1. protections that may be required to detect islanding/abnormal conditions include, but are not limited to, Overvoltage (59), Undervoltage (27), Voltage balance (60), Overfrequency (81 O), and Underfrequency (81 U), as shown in Exhibits G.1 and G.2 of this Schedule G.
  - 1.4.5.2. the frequency-protection settings on larger generating units shall coordinate with the provincial load-shedding system and with requirements of reliability organizations.
- 1.4.6. Blocking relays (21 BL) with remote signal-sending auxiliaries at the generating station and receiving auxiliaries at the transmission (terminal) station(s) may be required to prevent the Transmitter's distance relays from operating due to faults on the Generator's low-voltage bus. Communication media between the stations, similar to a single remote/transfer trip channel, would then be required for the blocking system, to prevent incorrect relay operation for this condition.

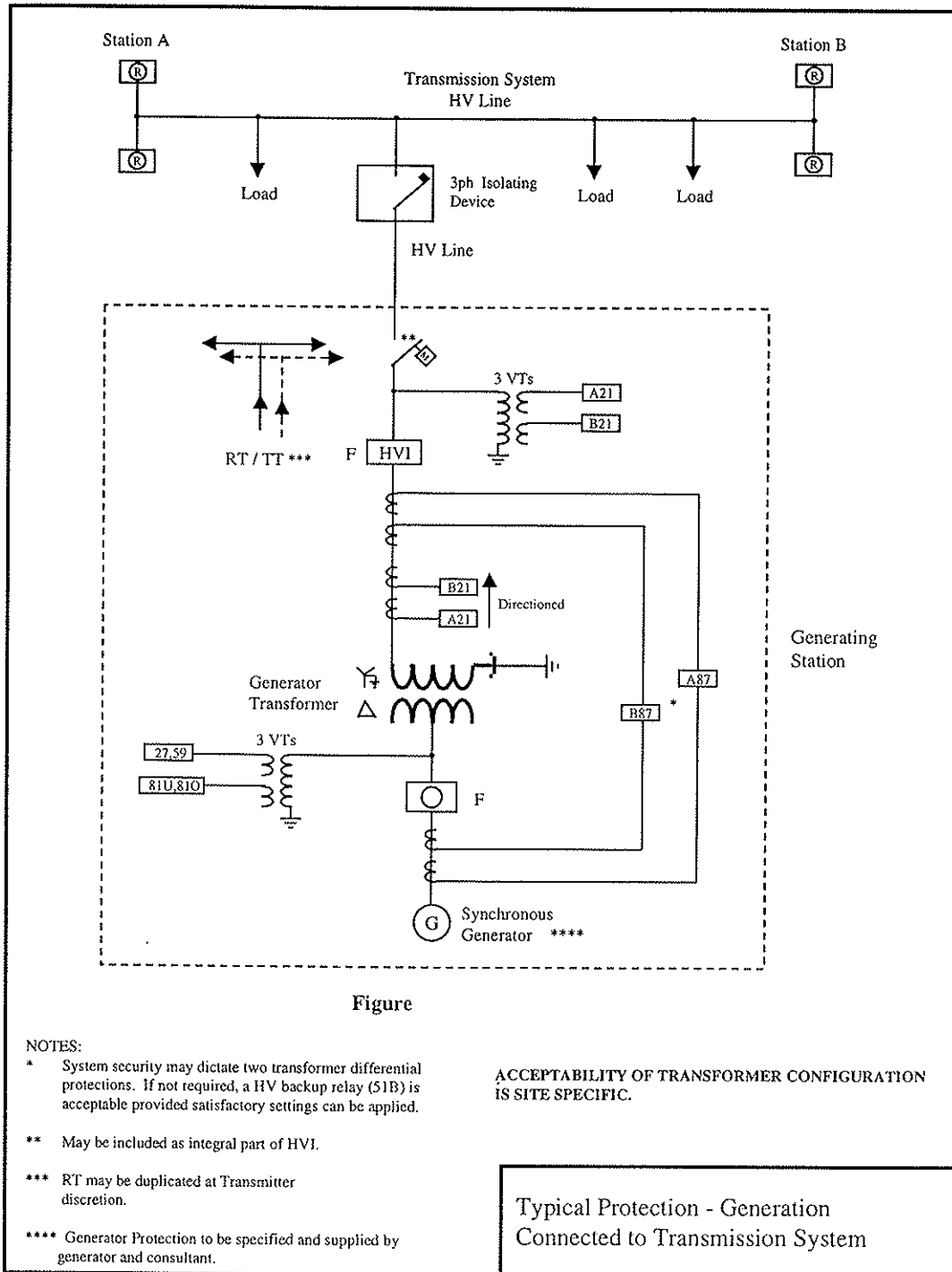
## 1.5. Autoreclosure and Manual Energization

- 1.5.1. The Generator shall provide suitable equipment to protect its plant and equipment for any conditions on the transmission system such as reclosing, faults, and voltage unbalance.

- 1.5.2. Following a protection operation on a transmission line, the transmission breakers, located mainly in network switching and/or transformation stations, shall reclose after a certain time delay. The Generator shall provide a reliable means of disconnecting its equipment before this reclosure. The Generator is responsible for protecting its own equipment and the Transmitter is not liable for damage to the Generator's equipment. The Generator may request a means of supervising the transmission reclosure prior to the disconnection of its equipment e.g. changes in protection logic at one or both stations to reduce the risk of such events.
- 1.5.3. A Generator's transmission system breaker shall not autoreclose without the Transmitter's approval.
- 1.5.4. Manual energization of a Transmitter's line by a Generator's facilities is permitted only under the Transmitter's direction.

## SCHEDULE G (CONT'D)

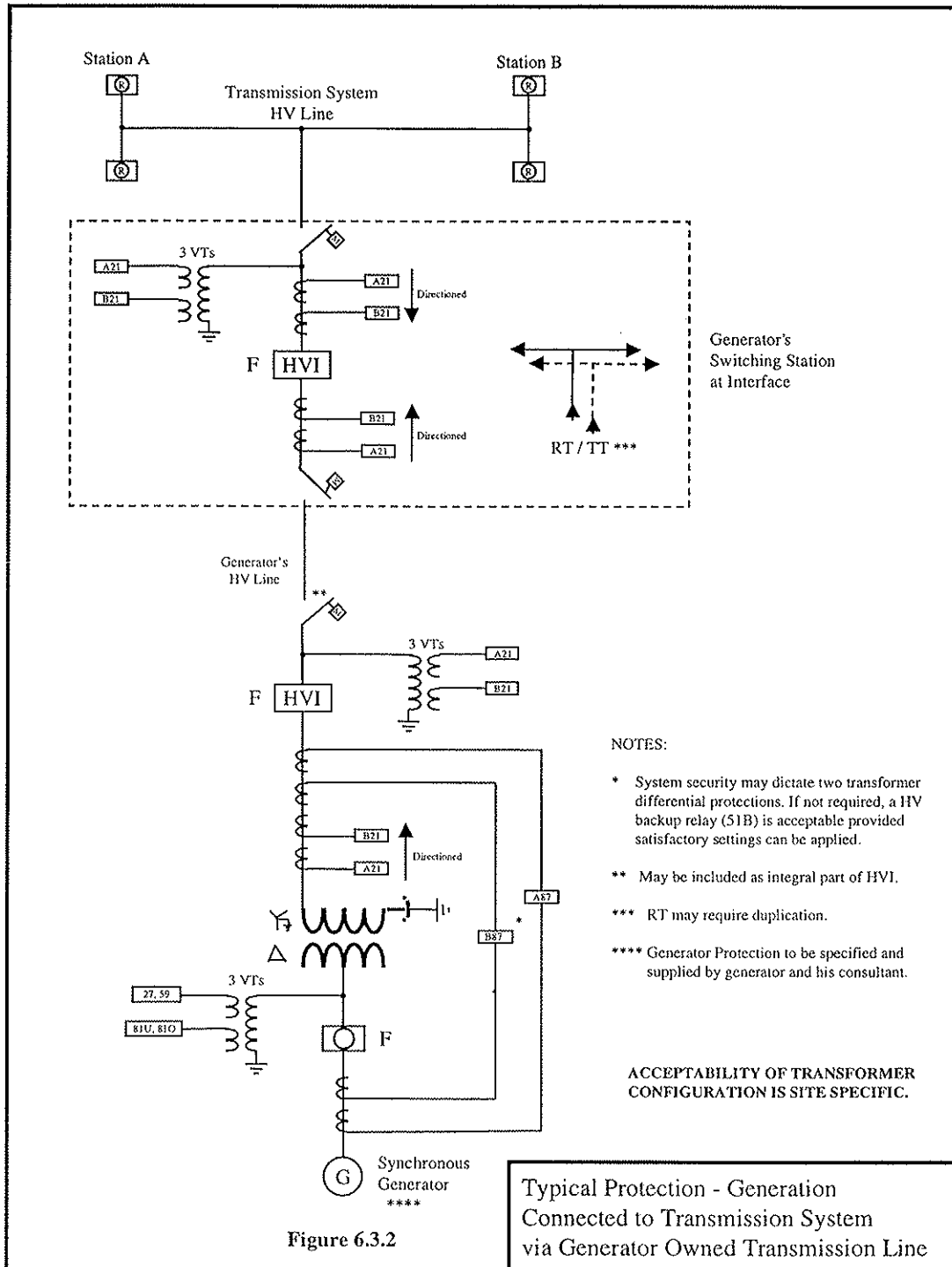
### Exhibit G.1 Typical Generator Protection Requirements





## SCHEDULE G (CONT'D)

### Exhibit G.2 Typical Generator-owned Transmission Line Protection Requirements



## SCHEDULE G (CONTD)

### Exhibit G.3 Typical Generator Protections

The following are typical Generator protections. The actual ones are to be specified and supplied by the Generator and his consultants. The Transmitter will be interested in the capabilities and settings of the frequency protections and voltage protections. The settings of the frequency protections on large units must comply with NPCC performance requirements. All protections settings must be submitted to the Transmitter and the IMO.

#### Typical Protections

<b>Thermal Units</b>	<b>Protections</b>	<b>Hydraulic Units</b>	<b>Protections</b>
Differential	A87,B87	Differential	A87,B87SP
Stator Ground	A64N,B64N	Stator Ground	A64N,B64N
Loss of Excitation	A40,B40	Loss of Excitation	B40
Phase Unbalance	A46,B46	Phase Unbalance	A46
Over/under frequency	B81H,B81L	Overvoltage	A59
Over/under excitation	A59H,A59L	Phase Backup	B21B
Out-of-step	B21	Over/under frequency	B81H,B81L
Low Forward Power	A32,B32	Condense-to-Generate	B81-83
Sup Start Phase	A50S		
Sup Start Ground	A64S		
U/F Supervision	A81S		
Speed Switch	A14S		

## **SCHEDULE H**

### **TECHNICAL REQUIREMENTS FOR TAPPED TRANSFORMER STATIONS SUPPLYING LOAD:**

#### **a) Transmitter's Tapped Transformer Stations**

#### **b) Distributor's and Consumer's Tapped Transformer Stations**

##### **1.1. Supply Considerations**

- 1.1.1. The Transmitter shall determine, in consultation with its Customers, the supply voltage to the Customer. The 115 kV or 230 kV voltage shall be generally used for supply of Customers with a peak demand of 20 MW or more.
- 1.1.2. Tapped transformers of Transmitters, Consumers or Distributors, excluding those that are deemed compliant under section 2.6 of the code, shall have adequate on-load tap-changer or other voltage-regulating facilities to operate continuously within normal variations on the transmission system as set out in the Market Rules and to operate in emergencies with a further transmission system voltage variation of  $\pm$  six per cent ( $\pm 6\%$ ).
- 1.1.3. The neutrals of the power transformer primary windings at transmission system tapped stations are normally not grounded. Transmitters shall approve grounded transformers by exception only.
- 1.1.4. Consumers and Distributors shall participate in load shedding to meet reliability standards.
- 1.1.5. A transmission system breaker of a Consumer or Distributor shall not autoreclose without Transmitter's approval.
- 1.1.6. A Consumer or a Distributor shall not manually energize a Transmitter's line without the Transmitter's approval.
- 1.1.7. To meet the minimum general requirements for all equipment connected to the transmission system, a Customer may have to install any necessary equipment, including, for example, capacitors and filters.

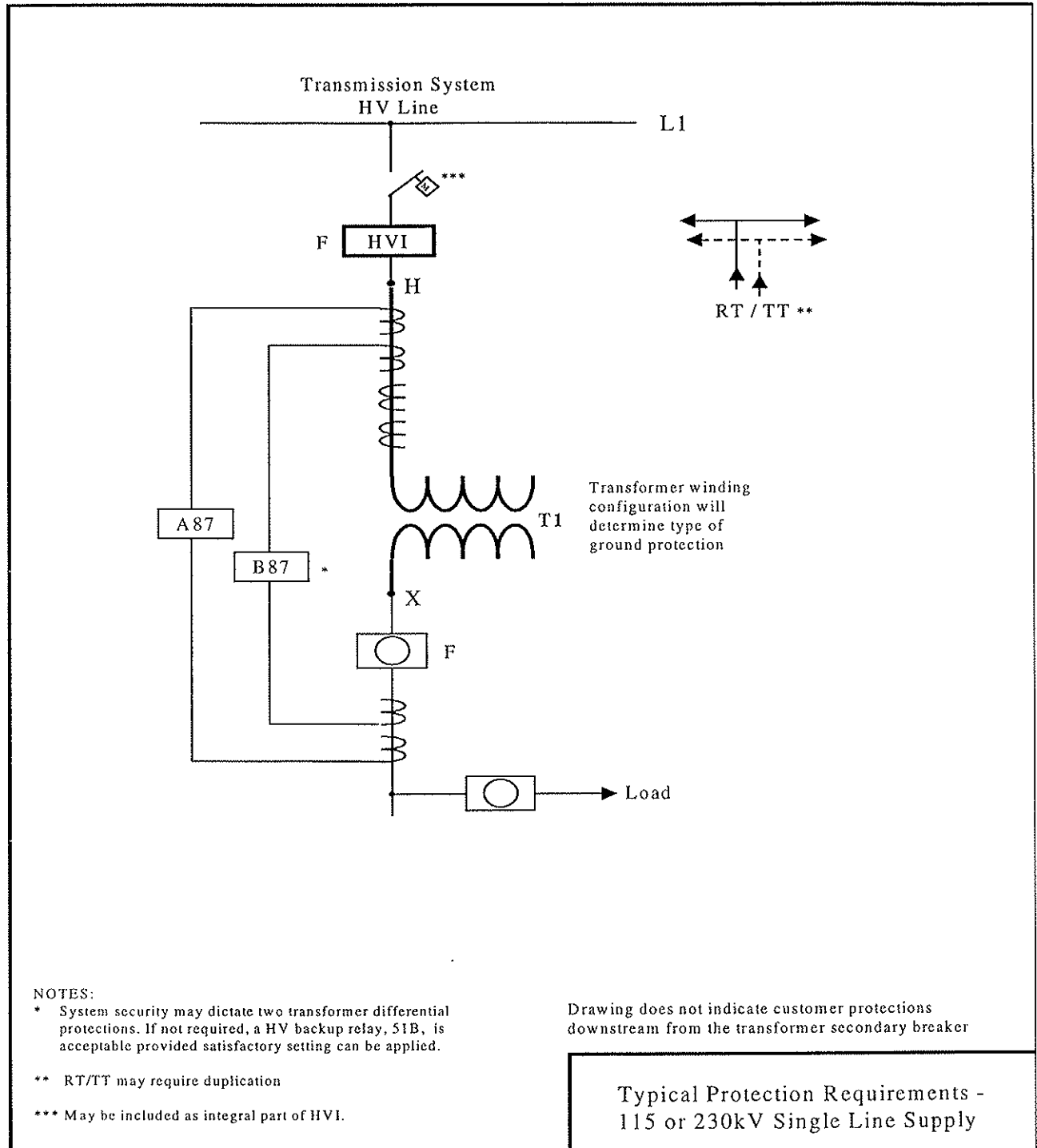
##### **1.2. Protection Requirements**

- 1.2.1. The typical technical requirements for Distributor and Consumer protection shall be followed, as presented in Exhibit F.1 of Schedule F and Exhibits H.1 and H.2 of this Schedule H.
- 1.2.2. Line protections are required when transformers connected to separate supply circuits are operated in parallel on the low-voltage side, or if a large synchronous infeed exists at the low-voltage bus.
- 1.2.3. Directional current sensing relays may be required to detect infeed into faults within the transmission system and isolate the Customer's contribution to the fault. Distance or impedance (21) relays as specified in Exhibit H.2 of this Schedule H, usually serve this need.
- 1.2.4. If the transformer is connected ungrounded wye or delta on the primary, then ground undervoltage (64-27) and ground overvoltage (64-59) protections as shown in Exhibit H.2 of this Schedule H are required to detect ground faults.

- 1.2.5. Where the Transmitter has accepted transformers connected wye-grounded on the primary (Yg/D or Yg/Yg), a ground-overcurrent relay (64) as indicated in Exhibit H.2 of this Schedule H, connected in the transformer neutral, may be used for detection.
- 1.2.6. Where remote/transfer trip circuits are used for transformer faults to trip the Transmitter's line breakers at the terminal stations, the Customer shall use a motor-operated transformer disconnect switch at its station to provide a point of separation from the transmission system. Energization of remote/transfer trip and opening of the disconnect switch (89) shall be initiated simultaneously from the protection circuits. Full opening of the disconnect switch shall block sending of remote trip.
- 1.2.7. For a DC remote trip on a 115-kV system, the Customer shall provide all necessary equipment associated with one monitored teleprotection channel between its station and one of the supply terminal stations or tapped stations. Industry standard relays and associated equipment that is compatible with the Transmitter's remote trip equipment shall be used. A 115-kV transfer trip shall have a similar requirement, except that audio-tone equipment shall be used instead of the DC battery voltage.
- 1.2.8. For a DC remote trip on a 230-kV system, the Customer shall provide all necessary equipment associated with two monitored teleprotection channels between its station and one of the supply terminal stations or tapped transformer stations. Normally two circuits in the same cable would be acceptable, but two separate cables going by and following separate routes may be required. The Customer shall use industry standard relays and associated equipment that is compatible with the Transmitter's remote trip equipment. A 230-kV transfer trip shall have a similar requirement, except that audio-tone equipment shall be used instead of the DC battery voltage.

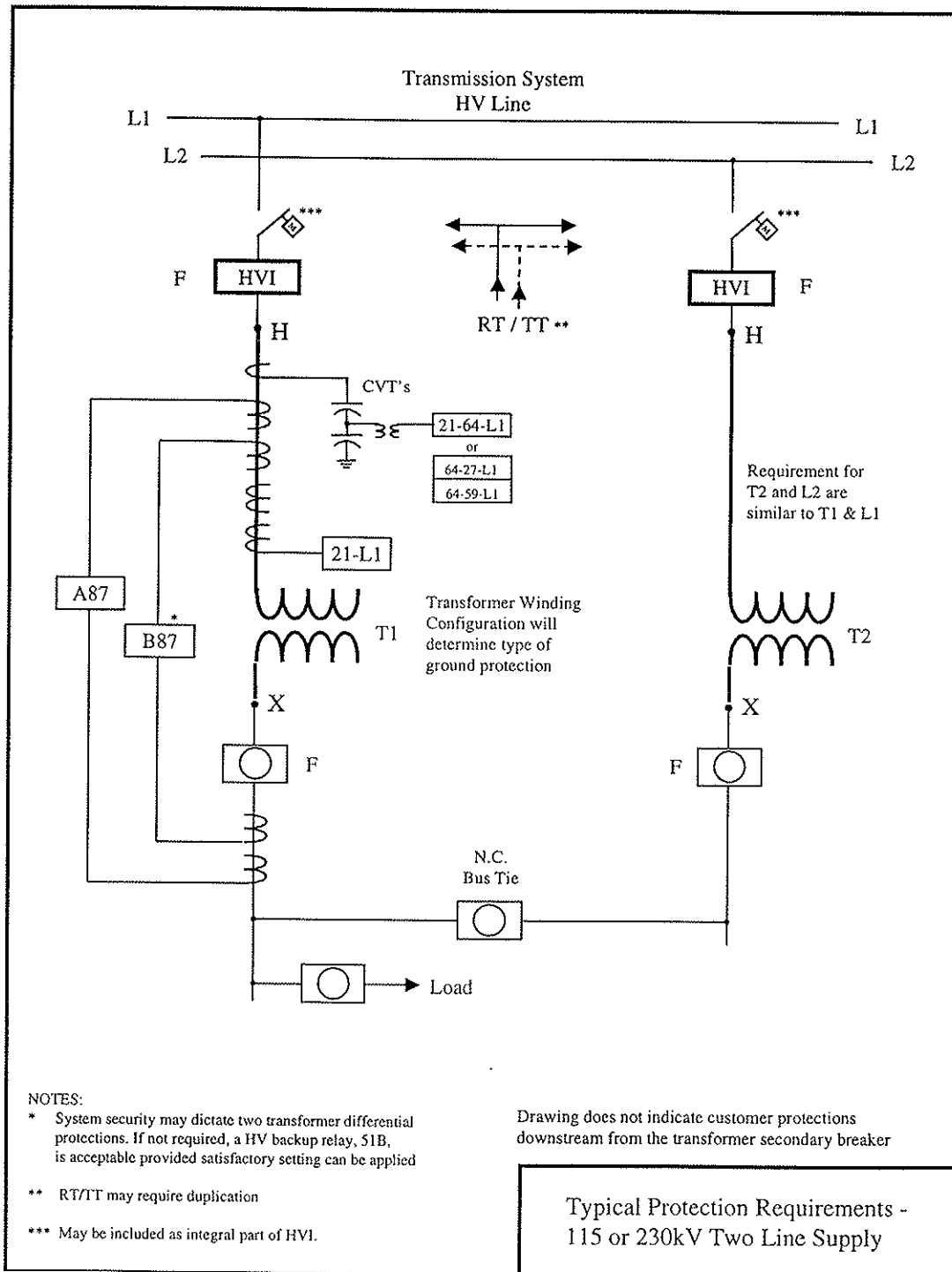
## SCHEDULE H (CONT'D)

### Exhibit H.1 Typical Single-Line Protection Requirements



## SCHEDULE H (CONT'D)

### Exhibit H.2 Typical Two Line Protection Requirements



## **SCHEDULE I**

### **PROTECTION SYSTEM REQUIREMENTS**

#### **1.1. Telecommunications**

- 1.1.1. The telecommunication facilities, used for protection purposes, shall have a level of reliability consistent with the required performance of the protection system.
- 1.1.2. Transmitters shall specify telecommunication channel media and protective systems.
- 1.1.3. Telecommunication circuits used for the protection and control of the transmission system shall be dedicated to that purpose.
- 1.1.4. Where each of the dual protections protecting the same system element requires communication channels, the equipment and channel for each protection shall be separated physically and designed to minimize the risk that both protections might be disabled simultaneously by a single contingency.
- 1.1.5. Telecommunication systems shall be:
  - 1.1.5.1. designed to prevent unwanted operations such as those caused by equipment or personnel;
  - 1.1.5.2. powered by the station's batteries or other sources independent from the power system;  
and
  - 1.1.5.3. monitored in order to assess equipment and channel readiness.
- 1.1.6. Major disturbances caused by telecommunication failures shall have annual frequency of less than 0.002 per year from the dependability aspect and less than 0.002 per year from the security aspect.
- 1.1.7. Telecommunication protection for a single transmission system circuit shall have an unavailability less than forty two (42) minutes per year, and for two circuits it shall be less than four (4) minutes per year.
- 1.1.8. The telecommunication false-trip rate used as part of a protection system for a single transmission system circuit shall be not more than 0.1 false trips per year, and for two circuits it shall be not more than 0.001 false trips per year.
- 1.1.9. Total transmission system circuit trips coincident with telecommunications failure shall be not more than 0.001 per year.

#### **1.2. Test Schedule for Relaying Communication Channels**

- 1.2.1. Communication channels associated with protective relaying shall be tested at periodic intervals to verify that the channels are operational and that their characteristics lie within specific tolerances. The testing consists of signal adequacy tests and channel performance tests.
  - 1.2.1.1. signal adequacy test intervals are:
    - 1.2.1.1.1. Channels - for Protection (unmonitored) at one(1)-month intervals
    - 1.2.1.1.2. Channels - for Protection (monitored) at twelve(12)-month intervals

- 1.2.1.2. channel performance testing on leased communication circuits shall be conducted at 24-month intervals, while intervals for testing power line carrier equipment shall be equipment-specific.

### 1.3. Verification and Maintenance Practices

- 1.3.1. Customers shall perform routine verifications of protection systems on a scheduled basis as specified by the Transmitter in accordance with applicable reliability standards. The maximum verification interval is four years for most 115-kV elements, most transformer stations, and certain 230-kV elements and two years for all other high-voltage elements. All newly commissioned protection systems shall be verified within six months of the initial in-service date of the system.
- 1.3.2. Routine verification shall ensure with reasonable certainty that the protections respond correctly to fault conditions.
- 1.3.3. An electrically initiated simulated-fault clearing check is mandatory to verify new protections, after any wiring or component changes are made to a protection, and for routine verification of a protection.
- 1.3.4. Customers shall ensure that the functional testing of protection and metering can be properly performed and that all verification readings are obtainable.
- 1.3.5. The Transmitter shall co-ordinate the initial verification upon receipt of the approved and final set of drawings. The initial verification shall be used during the final commissioning phase of the station and shall be used as a basis for future periodic verifications.
- 1.3.6. Transmitters and Customers shall agree upon the final functional test procedures before the tests begin. If they cannot agree, the supply or continuity of supply shall depend on the performance of the tests that the Transmitter shall require.
- 1.3.7. Before the initial functional tests are performed, the Customer shall supply the Transmitter with written documentation that shall readily provide confirmation that appropriate verifications have been completed and that all calibrations, tests, etc., have been performed. For components that may affect the transmission system (such as relays, meters, etc.), the Customer must satisfy the Transmitter that the proper settings have been applied.
- 1.3.8. Customers shall make available to the Transmitter records of relay calibrations and protection verifications, so that records of the facility's performance can be maintained. The specific records required shall be identified in this Agreement.

### 1.4. Functional Tests and Periodic Verification

- 1.4.1. Upon verification that the Customer's static tests on protection and control equipment, outlined in the Code and this Agreement, have been satisfactorily completed, a series of tests shall be performed with the equipment in a dynamic mode. These tests shall ensure that the equipment performs correctly when it should and also that it will not operate improperly.
- 1.4.2. These tests are here described only in general terms, since the specific tests to be performed will differ depending on the particular station configuration, the components or equipment used, and the design philosophy of the circuitry.
- 1.4.3. For DC circuitry checks, the logic of the auxiliary circuitry shall be thoroughly checked with the DC applied and the initiating devices suitably energized to initiate the process. When primary relays are the initiating device, the initiation shall be achieved by secondary injection of appropriate electrical quantities to the measuring elements. In certain cases where the sequence of operation is critical, monitoring by a



portable sequence-of-events recorder may be required for proper analysis. Operation/tripping of all interrupting/isolating devices shall always be verified, as well as annunciation and target operation.

- 1.4.4. "On potential" checks shall follow all necessary preliminary procedures. The main equipment shall be energized but not placed on load. The Customer shall check all readings of potentials, including determination of correct phasing/phase rotation. The test must also demonstrate that all equipment performs as expected when energized and is in condition to have primary load applied.
- 1.4.5. Customers shall make "On-Load" checks following the application of appropriate load, voltage, current, phase angle or crossed wattmeter readings at the appropriate instrument transformer outputs or protection input points, to ensure that all quantities are appearing as required with respect to magnitude, phase relation, etc. These checks are to determine that relays are properly connected and that the watt and var checks of all indicating and referenced equipment are correct. At times it may be necessary to repeat some or all tests, e.g. relay performance, using load currents.

## **1.5. Failure Protection for High-Voltage Interrupting Devices (HVIs)**

- 1.5.1. Protection shall be provided to trip local and remote breakers if a HVI fails to clear a fault properly. The requirements for HVI failure protection vary depending on the maximum permissible fault duration and the location of the connection on the transmission system. Some portions of the transmission system are designed and operated to more stringent requirements to avoid adversely affecting neighbouring transmission systems.
- 1.5.2. Some portions of the transmission system will require the HVI failure protection to be achieved by using remote or transfer trip circuits and opening of the motor operated disconnect switch.
- 1.5.3. In portions of the transmission system having less stringent requirements, the HVI failure protection may be achieved by opening of the motor-operated disconnect switch. If the disconnect switch experiences a flashover, the line protection at the transmission station(s) shall operate to isolate the fault.
- 1.5.4. Automatic ground switches are not acceptable for any new installations for triggering line protection operation following the failure of a HVI.
- 1.5.5. When circuit switchers are used, the interrupter and disconnect switch shall operate independently. Protections that trip the interrupter shall simultaneously initiate opening of the disconnect switch.
- 1.5.6. The DC voltage supplied to the interrupter and disconnect switch shall be fed from separately fused and monitored DC supplies: that is, by two (2) DC cables to the control cabinet.

## **1.6. Instrument Transformers**

- 1.6.1. Current transformer output shall remain within acceptable limits for all anticipated fault currents and for all anticipated burdens connected to the current transformer.
- 1.6.2. Current transformers shall be connected so that adjacent relay protection zones overlap.
- 1.6.3. Voltage transformers and potential devices shall have adequate volt-ampere capacity to supply the connected burden while maintaining their accuracy over the specified primary voltage range.
- 1.6.4. For each independent protection system, separate current and voltage transformer or potential device secondary windings shall be used, except on low-voltage devices.

- 1.6.5. Interconnected current transformer secondary wiring and voltage transformer secondaries shall each be grounded at only a single point.

## **1.7. Battery Banks and Direct Current Supply**

- 1.7.1. When station battery banks are used, as a minimum requirement the Customer shall ensure that if either the battery charger fails or the AC supply source fails, the station battery bank shall have enough capacity to allow the station to operate for at least eight hours.
- 1.7.2. Critical DC supplies shall be monitored and annunciated such as relay protection circuits and high voltage interrupters (HVIs).
- 1.7.3. Where the use of a single battery bank is allowed, the following conditions shall be met:
  - 1.7.3.1. it can be tested and maintained without removing it from service;
  - 1.7.3.2. where two separate protective systems are required, each protection system shall be supplied from physically separated and separately fused direct current circuits; and
  - 1.7.3.3. no single contingency other than failure of the battery bank itself shall prevent successful tripping for a fault.

## **SCHEDULE J**

### **EXCEPTIONS TO CUSTOMER'S REPRESENTATION, WARRANTIES AND EQUIPMENT COMPLIANCE DETAILS**

☐ **Compliance:**

The customer has no exceptions to its general representation, warranties and equipment compliance details.

Customer signing Officer Initial .....

☐ **Customer Acknowledgement of Exceptions:**

The customer acknowledges its connection to the transmission system does not meet actual code compliance but is deemed compliant, as outlined in section 9, Representations and Warranties, subsection 9.1.1.3, page 9 of the Transmission Code. The table on the following page completed by the customer provides a listing of the customer's exceptions.

Customer signing Officer Initial .....

Note: Check and initial applicable paragraph, strike out non-applicable paragraph.

Table J1 - Customer Exceptions

Section Number of TSC	Description of Exception	Comments & References

Note: Expand table as required.

## **SCHEDULE K**

### **DATA THAT TRANSMITTER MUST SUBMIT TO CUSTOMER**

- (a) The following Information shall be made available to the Customer, provided that: (1) such data is available; (2) the confidentiality of Information process and safeguards are not violated :
- feeder amperes per phase,
  - bus voltage,
  - real and reactive power flow per feeder (where available; otherwise per bus level),
  - feeder breaker open/close status,
  - feeder breaker recloser blocked/not blocked status,
  - bus tie breaker open/close status,
  - capacitor bank breaker open/close status,
  - energy pulse output in kW.h and kVar.h per Customer feeder.
  - energy pulse output in kW.h and kVar.h per station bus.
  - transformer/bus breaker open/close status.
- (b) Other Information: to be specified based on site specific considerations.



## SCHEDULE L

### CONTACTS FOR PURPOSE OF NOTICE

1) Hydro One Networks Contact:

Att'n: Manager Network Customer Contracts  
483 Bay Street, TCT 15- B7  
Toronto, Ontario  
M5G-2P5  
416-345-5966

2) Customer Contact:

Att'n John Alton  
Vice-President Administration & Finance  
4548 Ontario Street, - Unit #2  
Beamsville, Ontario  
L0R-1B5

James Detenback  
Vice-President Operations  
4548 Ontario Street, - Unit #2  
Beamsville, Ontario  
L0R-1B5





## Schedule M

### Amendment Agreement Template

THIS AGREEMENT made the \_\_\_\_\_ day of \_\_\_\_\_ 200\_\_.

**BETWEEN:** HYDRO ONE NETWORKS INC., a corporation incorporated pursuant to the laws of the Province of Ontario, (the "Transmitter") and licensed by the Ontario Energy Board.

#### **PARTY OF THE FIRST PART;**

and NIAGARA WEST TRANSFORMATION CORPORATION, a corporation incorporated pursuant to the laws of the Province of Ontario, (the "Customer")

#### **PARTY OF THE SECOND PART.**

From time to time, the Transmitter and the Customer shall be individually referred to in this Agreement as "Party" and collectively as "Parties".

#### **WHEREAS:**

1. The Transmitter and the Customer entered into a Connection Agreement dated \_\_\_\_\_ (the "Connection Agreement") setting out the terms and conditions of the offer, acceptance, provision and receipt of Transmission Services (as defined in the Transmission System Code issued by the Ontario Energy Board).
2. This agreement is supplemental to, and amends, the Connection Agreement.
3. The parties intend to amend the Connection Agreement in the manner set out below:

**NOW THEREFORE**, in consideration of the foregoing, and of the mutual covenants, agreements, terms and conditions herein contained, the Parties, intending to be legally bound, hereby agree as follows:

1. The Connection Agreement is amended as of the date of this agreement by deleting [Insert the words, lines, sections, subsections to be deleted and pinpoint specifically-- e.g., the words/phrase "\_\_\_\_\_" in line \_\_\_\_ of subsection \_\_\_\_] (if applicable, add), and substituting the following: [Insert the replacement words/phrase].

**AND/OR**

1 or 2 (as applicable). The Connection Agreement is amended as of the date of this agreement by adding the following clause OR adding the following words to clause \_\_\_\_ (as applicable): "[insert the words or clause to be added]"

2 or 3 (as applicable). The Connection Agreement as amended and varied shall continue in full force and effect for the remainder of the Term (as defined in the Connection Agreement).

The parties hereto have set their hands and seals the day, month and year first written above.

**SIGNED, SEALED AND DELIVERED**

HYDRO ONE NETWORKS INC.

By: \_\_\_\_\_

Name: \_\_\_\_\_

Title: \_\_\_\_\_

NIAGARA WEST TRANSFORMATION  
CORPORATION

By: \_\_\_\_\_

Name: \_\_\_\_\_

Title: \_\_\_\_\_

By: \_\_\_\_\_

Name: \_\_\_\_\_

Title: \_\_\_\_\_

I/We have authority to bind the Corporation

I/We have authority to bind the Corporation

**Schedule "N"**  
**Additional Obligations**

Throughout this Schedule "N", the following terms shall have the following meanings:

**"Available Capacity"** is 28.0 MVA for Grimsby Power; and 28.0 MVA for Pen West at Beamsville TS (partly supplied by the Transmitter distribution feeder 18M2) and 27.8 MVA for Pen West at Vineland DS

**"Base Load Trigger Point"** was determined using the following formula for each of Pen West and Grimsby Power:

Base Load Trigger Point = 3 yr. Avg. PLI \* Available Capacity

With:

PLI = [(sum of Twelve Monthly Peaks)/Annual Peak\*12]

**"Customer's Facilities"** has the meaning set forth in the Transmission System Code and includes, but is not limited to, Niagara West MTS comprised of two 50/67/83 MVA 215.5-28 kV transformers with ULTC, HV wye connected, and LV zigzag connected.

**"Grimsby Power"** means Grimsby Power Inc. and any successors or assigns of Grimsby Power Inc.

**"Grimsby Power Base Load Trigger Point" or "GPBLTP"** is 19.274 MW (12 month average) of load in accordance with the terms of the Letter Agreement made between the Transmitter and Grimsby Power Inc. in February 2004.

**"Pen West"** means Peninsula West Utilities Limited and any successors or assigns of Peninsula West Utilities Limited.

**"Pen West Base Load Trigger Point" or "PWBLTP"** is 42.256 MW (12 month average) of load.

**"Pen West Beamsville BLTP" or "PWBLTP"** is 21.204 MW (12 month average) of load.

**"Pen West Vineland BLTP" or "PWVBLTP"** is 21.052 MW (12 month average) of load.

**"Third Party Facilities"** means any facilities owned or operated by an entity other than the parties hereto.

**"Transmitter's Facilities"** has the meaning set forth in the Transmission System Code and includes, but is not limited to, the Transmitter's Facilities Serving Pen West and the Transmitter's Facilities Serving Grimsby Power.

**"Transmitter's Facilities Serving Pen West"** means the following facilities:

- (a) Beamsville TS (T3/T4 transformers);
- (b) Vinelands DS (T1/T2 transformers);
- (c) line taps from 230 kV Circuits Q23BM/Q25BM to the Niagara West MTS;
- (d) Beamsville TS "B" and "Y" buses: breaker positions 18M1 and 18M2; and
- (e) Vineland DS feeder positions F1 and F2.

**"Transmitter's Facilities Serving Grimsby Power"** means the following facilities:

- (a) Beamsville TS (T3/T4 transformers);
- (b) line taps from 230 kV Circuits Q23BM/Q25BM to the Niagara West MTS; and
- (c) Beamsville TS "B" and "Y" buses: breaker positions 18M3 and 18M4.

## 1. The Customer:

- (a) shall not Transmit or Distribute electricity using the Customer's Facilities to any load now or hereafter supplied from the Transmitter's Facilities or Third Party Facilities and if the Customer does so, the Customer shall pay the Transmitter an amount equal to the avoided applicable Transmission Rates as if the load remained on the Transmitter's Facilities or the Third Party Facilities, as the case may be, until the date that:
  - (i) the Transmitter's Facilities or the Third Party Facilities are removed from service at end-of-useful-life and are not replaced by new transmission facilities; or
  - (ii) the Transmitter requires the Transmitter's Facilities to provide transmission services to other Customers or the affected third party requires the Third Party Facilities to supply its customers;

whichever occurs first;
- (b) shall not permit any third party to transmit or distribute electricity using or by connecting to the Customer's Facilities or in any other manner, to any load now or hereafter supplied from the Transmitter's Facilities or the Third Party Facilities and if the Customer does so, the Customer shall pay the Transmitter an amount equal to the avoided applicable transmission rates as if the load remained on the Transmitter's Facilities or the Third Party Facilities until the date that:
  - (i) the Transmitter's Facilities or the Third Party Facilities are removed from service at end-of-useful-life and are not replaced by new transmission facilities; or
  - (ii) the Transmitter requires the Transmitter's Facilities to provide transmission services to other customers or the affected third party requires the Third Party Facilities to supply its customers,

whichever occurs first;
- (c) shall not supply new load growth using the Customer's Facilities or the Third Party Facilities when the Transmitter has spare capacity available at the Transmitter's Facilities to supply such load; and if it does so, the Customer shall pay the Transmitter an amount equal to the avoided applicable transmission rates by paying as if the new load were supplied from the Transmitter's Facilities. Notwithstanding the foregoing, the Customer will not owe any amounts to the Transmitter, if the Customer can demonstrate to the satisfaction of the Transmitter, acting reasonably, that it would have been uneconomic or inefficient for the Customer to supply the load growth in question using the Transmitter's Facilities;
- (d) acknowledges together with the Transmitter that the Customer is connecting a new transformer station, Niagara West MTS (the "New Station"), to the Transmitter's transmission system and that:
  - (i) the new line connection asset is pool-funded, based on a load forecast guarantee provided by Grimsby Power;
  - (ii) the Customer shall ensure that the GPBLTP is maintained to fully utilize the existing supply points for Grimsby Power from the Transmitter's Beamsville Transformer Station ("Beamsville TS");
  - (iii) Grimsby Power and the Customer desire the flexibility of transferring existing or additional Grimsby Power load to the New Station, and may leave less than the required GPBLTP on the Transmitter's existing facilities in order to improve the operating efficiency of Grimsby Power's distribution system and accordingly, any load shifted to the New Station would attract transmission line Connection and Network charges from the IMO; and
  - (iv) by not maintaining the required minimum GPBLTP, the Transmitter would receive a shortfall in the Transformation Connection charges from Beamsville TS; and therefore agree as follows:

- (1) Notwithstanding anything to the contrary in Subsections 1(a), (b) and (c) above, the Transmitter agrees that the Customer may shift additional Grimsby Power load to the New Station and the Customer agrees that it will pay the Transmitter any shortfall in the Transformation Connection Charges at Beamsville TS based on the GPBLTP; and
- (2) The shortfall (if any) will be calculated and invoiced to the Customer on an annual basis starting one year after the end of the month following the In-Service date of the New Station based on the tariffs in effect at the time.

The provisions of this Subsection 1(d) shall be effective until the date that:

- (A) the Transmitter's Facilities Serving Grimsby Power are removed from service at end-of-useful-life and are not replaced by new transmission facilities; or
- (B) the Transmitter requires the Transmitter's Facilities Serving Grimsby Power to provide transmission services to other customers  
whichever occurs first;

(e) acknowledges together with the Transmitter that the Customer is connecting a new transformer station, Niagara West MTS (the "New Station"), to the Transmitter's transmission system and that:

- (i) the new line connection asset is pool-funded, based on a load forecast guarantee provided by Pen West;
- (ii) the Customer shall ensure that the PWBLTP is maintained to fully utilize the existing supply points for Grimsby Power from the Transmitter's to fully utilize the existing supply points for Pen West from the Transmitter's Beamsville Transformer Station ("Beamsville TS") and Vineland Distribution Station ("Vineland DS");
- (iii) Pen West and the Customer desires the flexibility of transferring existing or additional Pen West load to the New Station, and may leave less than the required PWBLTP on the Transmitter's existing facilities in order to improve the operating efficiency of Pen West's distribution system and accordingly, any load shifted to the New Station would attract Transmission Line Connection and Network charges from the IMO; and
- (iv) by not maintaining the required minimum PWBLTP, the Transmitter would receive a shortfall in the Transformation Connection charges from Beamsville TS and HVDS Transformation LV charges from Vineland HVDS when such charges are implemented and therefore the parties agree as follows:
  - (1) Notwithstanding anything to the contrary in Subsections 1(a), (b) and (c) above, the Transmitter agrees that the Customer may shift additional Pen West load to the New Station and the Customer agrees that it will pay the Transmitter any shortfall in the Transformation Connection Charges at Beamsville TS based on the PWBLTP and any shortfall in the HVDS charges at Vineland DS based on the PWVBLTP when HVDS charges are implemented, including any retroactive payments as approved by the OEB and/or Government; and
  - (2) the shortfall (if any) will be calculated and invoiced to the Customer on an annual basis starting one year after the end of the month following the In-Service date of the New Station based on the tariffs in effect at the time.

The provisions of this Subsection 1(e) shall be effective until the date that:

- (A) the Transmitter's Facilities Serving Pen West are removed from service at end-of-useful-life and are not replaced by new transmission facilities; or
- (B) the Transmitter requires the Transmitter's Facilities Serving Pen West to provide transmission services to other customers;  
whichever occurs first.

(f) nothing in Subsections 1(d) and 1(e) of this Schedule "N" affects:

- (i) Grimsby Power's obligation to the Transmitter to meet the existing available capacity rating of 28.0 MVA (based on Grimsby Power's total load) at least once per year until January 31, 2007 for the purposes of the Line Connection Pool Work debt repayment; or
  - (ii) Pen West's obligation to the Transmitter to meet the existing available capacity rating of 55.8 MVA (based on Pen West's total load) at least once per year until January 31, 2006 for the purposes of the Line Connection Pool Work debt repayment.
- (g) shall cause the purchaser, lessee or other third party to whom the Customer sells, leases, or otherwise transfers or disposes of the Customer's Facilities to enter into an assumption agreement with the Transmitter to assume all of the Customer's obligations under this Section 1.
2. Nothing contained within this Agreement, including, without limiting the generality of the foregoing, Section 2 shall preclude, prevent, prohibit or operate as a waiver of either Party's rights to:
- (i) make application to the Ontario Energy Board ("OEB");
  - (ii) participate in any hearings before the OEB; or
  - (iii) make any appeals to a court of competent jurisdiction regarding any decision by the OEB,
- with respect to any matter, issue, thing, interpretation, consideration or consequence whatsoever that is related to:
- A. the transmission or distribution of electricity to any load now or hereafter supplied from the Transmitter's Facilities or the facilities of any licensed electricity distributor by the Customer or by a third party using the Customer's Facilities to supply said load;
  - B. the interpretation or application of Section 1 above; and
  - C. the transmission and distribution of electricity to any load now or hereafter supplied from the Transmitter's facilities other than the Transmitter's Facilities or from facilities of any licensed electricity distributor by any other Customer or by a third party.
3. Section 1 above shall be subject to and applied in accordance with any Order or decision made by the OEB or any court with respect to any matter, issue, thing, interpretation, consideration or consequence that relates to:
- (i) the transmission and distribution of electricity to any load now or hereafter supplied from the Transmitter's Facilities or the facilities of any licensed distributor by the Customer or by a third party using the Customer's Facilities to supply said load; and
  - (ii) the terms and conditions of Section 1 above.
4. With respect to any order or decision of the OEB or a court relating to the transmission or distribution of electricity to any load now or hereafter supplied from facilities other than the Transmitter's Facilities or from the facilities of any licensed distributor by any Customer other than by the Customer or by a third party, the parties, acting reasonably, shall agree in writing as to application of said order or decision to section 1 and to any amendments thereto.
5. The Transmitter and the Customer have agreed to enter into this Transmission Connection Agreement on the assumption that the Customer will obtain an exemption from the Ontario Energy Board such that the Customer will not require a transmission licence. In the event that the Ontario Energy Board requires the Customer to obtain a transmitter's licence, the Customer agrees:
- (a) to execute a Connection Facilities Agreement with the Transmitter substantially in the form of the agreement attached hereto as Appendix 1 to this Schedule "N"; and
  - (b) that Sections 1 to 4 hereof and the definitions forming part of this Schedule "N" will be a term thereof.

Any Connection Facilities Agreement executed by the Parties in accordance with this Section 5 would supersede this Transmission Connection Agreement.