



Remotes Case 2&3 Form

REINDEER Cases 2&3 -Connection Impact Assessment (CIA) Application

Hydro One Remote Communities Inc. | Lori.Rice@hydroone.com | 1-807-474-2828

General Application Information

This Application Form is for Generators with a project size, based on the **generator nameplate**, which is greater than the 10 kW:

- New Generators applying for Connection Impact Assessment (“CIA”)
- New Generators applying for revision(s) to their original CIA
- This form is NOT for generation sizes of the 10 kW or less. Please fill out and submit the “Remotes Case 1 Form” (REINDEER Case 1 -Connection Impact Assessment (CIA) Application) **unless otherwise specified**.

For technical requirements of Hydro One Remote’s REINDEER projects, refer to the *Distributed Generation Technical Interconnection Requirements Interconnections at Voltages 50kV and Below* available at:

<http://www.hydroone.com/Generators/Pages/TechnicalRequirements.aspx>.

Application Submission Instructions:

Please return the completed form, fees and other required documents by email, FAX , or mail:

Email: RemotesCustomerService@HydroOne.com
Telephone: 1-888-825-8707
FAX: 1-807-475-3127
Address:
 Hydro One Remote Communities Inc.
 Attn: RemotesCustomerService Case 2 & 3 Form
 680 Beaverhall Place
 Thunder Bay, Ontario P7E 6G9

Important Notes

- Hydro One Remote Communities Inc. shall be hereafter referred to as “Remotes”
- Applicants are cautioned NOT to incur major expenses until Remotes approves to connect the proposed generation facility.
- All technical submissions (Case 2&3 Form, single line diagrams, etc.) must be signed and sealed by a licensed Ontario Professional Engineer (P.Eng.).
- **All fields below are mandatory, except where noted. Incomplete applications will be returned by Remotes**

Section A – Administrative Information (Completed By Remotes)

Date: ____ / ____ / ____ (dd / mm / yyyy)

Project Name: _____

Location: _____

REINDEER Reference Number: _____

Section B.1 – Project Information (ONLY if there have been changes since Remotes Form A)

1. **Type of connection:** Single phase **OR** Three phase
2. **Project Size:** Total requested DG output capacity (maximum DG power output): _____ kW
(Note: The project size must be in agreement with your REINDEER contract)
3. **Equipment Capacity:** Nameplate capacity (equipment rating as per manufacturer’s stamp): _____ kW
(Note: See section 2.1.2 of Hydro one’s Technical Interconnection Requirements)

4. Fuel / Renewable Energy Type:

- Biomass Solar (PV) Gas Turbine
 Wind Diesel Engine Other (please specify) _____
 Water (for water projects please answer (a) and (b) below):

- a) Is water your primary energy source? Yes No
 b) Is your generation facility located on provincial Crown or federally-regulated lands? Yes No

5. Project Location:

Community _____
 Lot/ID Number(s) _____
 Meter Number(s) (If applicable) _____
 Common Name (e.g "Water Treatment Plant") _____

6. Project Contact Information:

The Single Point of Contact for the project will be the (choose ONE): Owner Consultant

	Owner (Mandatory)	Consultant (Optional)
Company/ Person		
Contact Person		
Mailing Address (Street #)		
Mailing Address (Suite, Unit #)		
Work Tel. #		
Cell		
Fax		
E-mail		

Preferred method of communication with Remotes (check ONE): E-mail Telephone Mail Fax

Section B.2 – Project Information

7. Customer Status:

Is there an existing Remotes customer account at the project location? Yes No
 If yes, what is the Remotes 10 OR 12-digit account number of the property: _____
 Customer name registered on existing Account: _____
 Are you the existing account owner? Yes No
 Are you an HST registrant? Yes No
 If yes, provide your HST registration number: _____ - _____ RT _____
 Barcode of nearest Hydro pole serving project location: _____

8. Ontario Corporate Number: _____ **OR Business Identification Number:** _____

9. Proposed In- Service Date: ____ / ____ / ____ (dd / mm / yyyy)

Section C – Project Connection Information

In the following section:

- “**Point of Connection**” or “**POC**” means the point where the new Generator’s connection assets or new line expansion assets will be connected to the existing Remotes distribution system.
- “**Point of Common Coupling**” or “**PCC**” or “**Point of Supply**” means the point where the Generation facility is to connect to Remotes’ distribution system.
- The **POC** and the **PCC** may be the same, especially if the Generation facility lies along the existing Remotes distribution system; or the **PCC** may be located somewhere between the **POC** and the Generation facility if the new line will be owned by Remotes. For illustration of the **POC** and the **PCC**, refer to Appendix A attached.

10. Connection to Remotes’ Distribution System:

- a. Community: _____
- b. GPS coordinates of the following: (*GPS Format: Latitude, Longitude - Degree Decimal*
e.g. 49.392, -75.570)

POC: _____
PCC: _____
Generation Facility: _____
- c. Please select ONE applicable connection figure from Appendix A: A-1 A-2 A-3
- d. Length of line distance from the POC to the PCC: _____ km
- e. Length of line distance from the PCC to the Generation Facility (refer to Appendix A): _____ km
Conductor type/size: _____ / _____
- f. Fault contribution from the Generator’s Facilities, with the fault location at the PCC:
 Three-phase generators: 3-phase short circuit current: _____ A
 Single-phase generators: 1-phase short circuit current: _____ A

NOTES:

- If this project requires line expansion work between the **POC** and **PCC**, Remotes will provide a cost estimate to construct any line located on public road right-of-way. The cost estimate will include a breakdown of **Uncontestable** work (i.e. overbuild to existing line) that can only be performed by Remotes, as well as **Contestable** work (i.e. new construction/green-field) that can be performed by the Generator/their contractor or Remotes. (Both **Uncontestable** work and **Contestable** work requires the design to Remotes specifications). Remotes will become the owner of the line expansion.

11. Single Line Diagram (“SLD”):

Provide an SLD of the Generator’s facilities including the PCC, transformer(s) and connecting station, feeder, supply voltage, inverters, and all protection and control devices. The SLD should be as detailed as possible. SLD must be signed and sealed by a Professional Engineer in Ontario.

SLD Drawing No. _____, Rev. _____

Section D – Generation Characteristics

12. Generation Characteristics

- a. **Existing Generation:** Are there any existing generators at the PCC? Yes No
- b. Indicate annual generation projection (kW) with at least a 15 minute resolution. (i.e. projected annual kW output every 15 minutes for a whole year.) This should be attached as another document. Preferably an Excel document. (See Item 7 in Appendix B)
- c. Maximum projected dynamic generation response of the renewable resource over two (2) minutes at a resolution one (1) second. This should be attached as another document. (See Item 8 in Appendix B)

d. **Characteristics of Proposed Generation**

NOTE for facilities with multiple generators: Provide the manufacturer's technical data (electrical) for the generator or inverter. If your generators have different characteristics, please provide the characteristics for each generator on an additional sheet(s).

Number of generating unit(s): _____

Manufacturer / Type or Model No: _____ / _____

Rated capacity of each unit: _____ kW _____ kVA

Generator Output Voltage _____ kV

Generator Type: Rotating
 Static (PV, fuel cell, battery)

Generator phasing: Single phase
 Single phase connecting to three phase system
 Three phase

Power conversion technologies: Synchronous Induction Full inverter interfaced
 Other (Please Specify) _____

(If the machine type is "Other", please provide values equivalent to a Synchronous or Induction type Generator)

Limits of range of reactive power at the machine output:

- i. Lagging (over-excited): _____ kVAR power factor _____
ii. Leading (under-excited) _____ kVAR power factor _____

Limits of range of reactive power at the PCC:

- iii. Lagging (over-excited): _____ kVAR power factor _____
iv. Leading (under-excited) _____ kVAR power factor _____

Maximum Starting inrush current: _____ pu (multiple of full load current)

Generator winding connection: delta star

Neutral grounding method of star connected generator:

Solid Ungrounded Impedance: R: _____ ohms X: _____ ohms

For Synchronous Units (If applicable):

- a) Nominal machine voltage: _____ kV (LL)
- b) Unsaturated reactances on: _____ kVA base _____ kV base
 - Direct axis subtransient reactance, X_d'' _____ pu
 - Direct axis transient reactance, X_d' _____ pu
 - Direct axis synchronous reactance, X_d _____ pu
 - Subtransient time, T_d'' _____ ms
 - Transient time, T_d' _____ ms
 - Zero sequence reactance, X_0 _____ pu

For Induction Units (If applicable):

- a) Nominal machine voltage: _____ kV
- b) Unsaturated reactances on: _____ kVA base _____ kV base
 - Direct axis subtransient reactance, X_d'' _____ pu

For Inverter Characteristics (if applicable):

- a. Inverter Output rating (AC): _____ kW
- b. Nameplate voltage of AC output: _____ kV
- c. Nameplate voltage of DC input: _____ kV
- d. Number of Phases: single phase three phase
- e. Type of Inverter:
 - Line-Commutated Self-Commutated Other: _____
- f. Inverters meet UL 1741: Yes No
- g. Inverters meet CSA C22.2 No.107.1-01: Yes No
 - I. Any other standards met by Inverters: _____
- h. Method of synchronizing to system: Automatic Manual

NOTES:

- Inverters MUST meet UL 1741 and CSA C22.2 No.107.1-01.

13. Interface Step-Up Transformer Characteristics:

- a. Transformer ownership: Customer / Remotes
If transformer Remotes owned, provide the Remotes Account No. _____ **OR complete**
(b) to (h) below:
- b. Transformer rating: _____ kVA
- c. Nominal voltage of high voltage winding: _____ kV
- d. Nominal voltage of low voltage winding: _____ kV
- e. Transformer type: single phase three phase
- f. Impedances on: _____ kVA base _____ kV base
R: _____ pu, X: _____ pu
- g. High voltage winding connection: delta star

Grounding method of star connected high voltage winding neutral:

Solid Ungrounded Impedance: R: _____ ohms X: _____ ohms

h. Low voltage winding connection: delta star

Grounding method of star connected low voltage winding neutral:

Solid Ungrounded Impedance: R: _____ ohms X: _____ ohms

NOTES:

- At the Generator's expense, and, if requested, Remotes may provide transformation up to a maximum of 75 kVA single phase and 300 KVA three-phase, as described in the Hydro One Remote Communities Conditions of Service (Section 2.1.1.9).
- The term 'High Voltage' refers to the connection voltage to Remotes' distribution system and 'Low Voltage' refers to the generation or any other intermediate voltage.

14. Intermediate Transformer Characteristics (if applicable):

- a. Transformer rating: _____ kVA
- b. Nominal voltage of high voltage winding: _____ kV
- c. Nominal voltage of low voltage winding: _____ kV
- d. Transformer type: single phase three phase
- e. Impedances on: _____ kVA base _____ kV base
R _____ pu X _____ pu

f. High voltage winding connection: delta star

Grounding method of star connected high voltage winding neutral:

Solid Ungrounded Impedance: R _____ ohms X _____ ohms

g. Low voltage winding connection: delta star

Grounding method of star connected low voltage winding neutral:

Solid Ungrounded Impedance: R _____ ohms X _____ ohms

NOTE: The term 'High Voltage' refers to the intermediate voltage that is input to the interface step-up transformer and the 'Low Voltage' refers to the generation voltage.

15. High-Voltage Grounding Transformer Characteristics (if applicable):

Type: Zig-zag star-delta

Zig-zag Grounding Transformer zero sequence impedance (Z0): R _____ ohms X _____ ohms

Star-delta Grounding Transformer zero sequence impedance (Z0): R _____ ohms X _____ ohms

16. Load information:

- a. Maximum load of generating facility: _____ kVA _____ kW
- b. Maximum load current (referred to the nominal voltage at the connection point to Remotes system): _____ A
- c. Maximum inrush current to loads (referred to the nominal voltage at the connection point to Remotes system): _____ A

Attached Documents:

Item No.	Description	Document No.	No. of Pages
1			
2			
3			
4			

Attached Drawings:

Item No.	Description	Document No.	No. of Pages
1			
2			
3			
4			

Section E – Checklist

Please ensure the following items are completed prior to submission. The application will be returned if Remotes determines it is incomplete:

- Completed Remotes Case 2&3 Form stamped by a Professional Engineer
- Payment in full including applicable taxes by cheque, payable to “Hydro One Remote Communities Inc.” (As indicated on the Agreement for Services for Engineering Fees)
- Signed Agreement for Services for Engineering Fees (original signature is required)
- Detailed Single Line Diagram (SLD) of the Generator’s facilities, must be stamped by a Professional Engineer. SLD must follow the Hydro One Embedded Generation Single Line Diagram Requirements. See here for more details:
<http://www.hydroone.com/Generators/Documents/Feed-In%20Tariff/Embedded%20Generation%20SLD%20Requirements.pdf>
- Photos of nameplate data of all inverters and transformers
- Ensure that all applicable items in Appendix B are complete and attached to this Form.

Appendix A: Illustrations of PCC and Point of Connection

Figure A-1: Remotes Owns Entire Tap Line

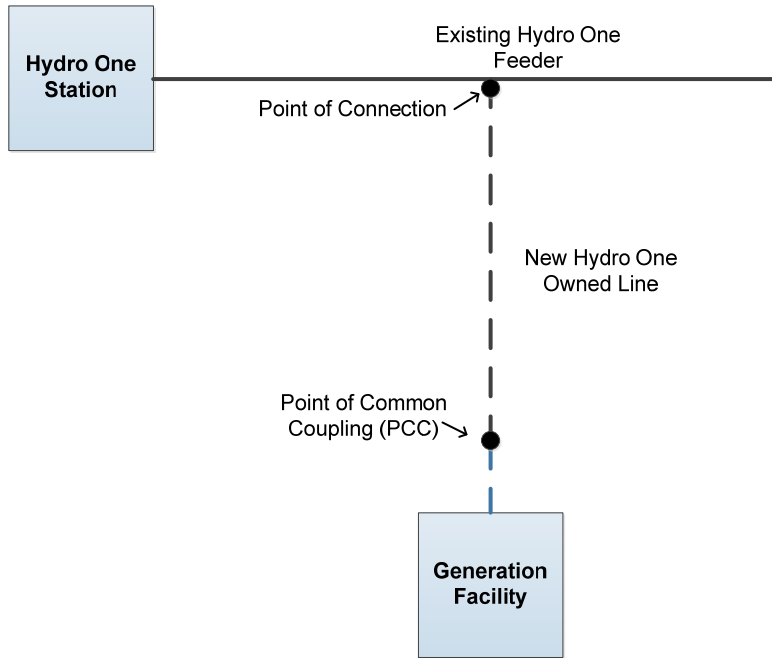


Figure A-2: Generator Owns Entire Tap Line

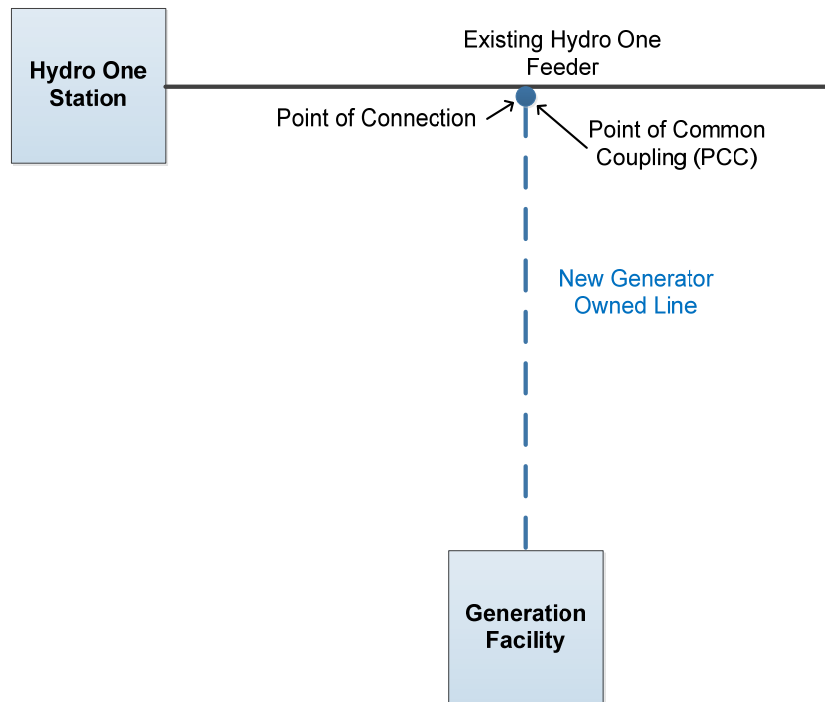
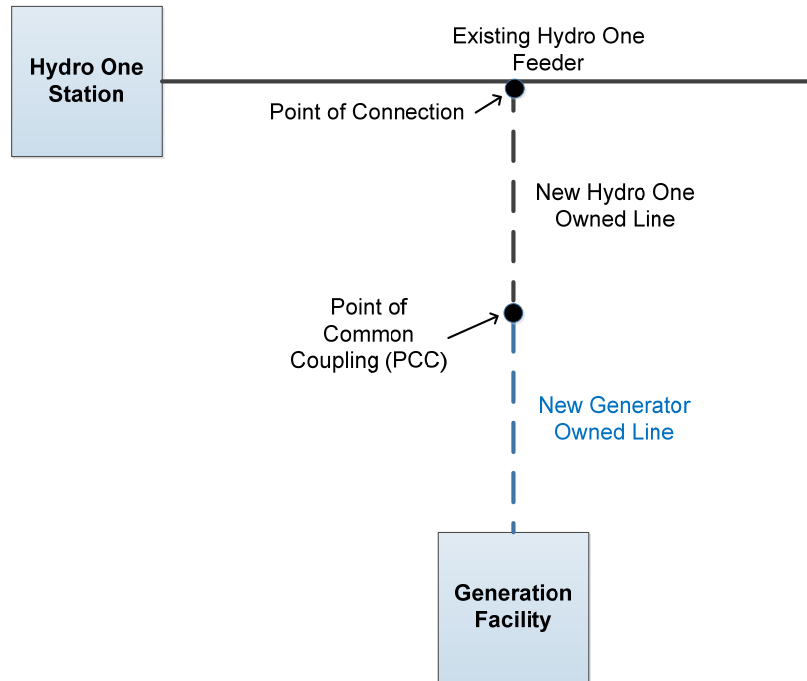


Figure A-3: Remotes Owns a Portion and Generator Owns a Portion of Tap Line



Appendix B: List of Required Documents

Connection of Generation Facilities to the Hydro One Remote Communities (Remotes) Distribution System LIST OF REQUIRED DOCUMENTS

Instructions: Please review the table below and return ALL required portions together with the rest of Remotes Case 2&3 Form

	Description	Case 2 and Case 3	Remarks
1.	Detailed Single Line Diagram (SLD) of the Generation Facility	Required	Show ratings of electrical components, generator & transformer neutral grounding, protection, metering, synchronizing schemes, inverters, etc. Refer to the following link for guidance: http://www.hydroone.com/Generators/Documents/Feed-In%20Tariff/Embedded%20Generation%20SLD%20Requirements.pdf
2.	Site Plan Showing General Arrangement of the Generation Facility	Required	Include location - street address, lot nos. etc. (include the location of lockable, visible-break isolating device)
3.	Interface Electrical Equipment Technical Information / Data Sheets / Manufacturer's Nameplate Information	Required	transformers, CTs, VTs, isolating / disconnect device, HV circuit breaker, fuses, surge arresters and other interface equipment
4.	Description of Protection Scheme	Required	Philosophy of Tripping for Internal & External Faults, Islanding and Other Abnormal Conditions
5.	Description of Synchronizing Scheme (Synchronous & Inverter Units) & Connection Scheme for Induction Units	Required	
6.	Description of Power Factor Control for Induction Generators (& Inverter Units, if applicable)	Required	Include details of capacitor switching and control, if applicable. Highlight: method, steps, safety features, interlocks with generator breaker etc.
7.	Annual Power Generation Projection	Required	Indicate annual generation projection (kW) with at least a 15 minute resolution. (i.e. projected annual kW output every 15 minutes for a whole year.)
8.	Maximum projected dynamic generation response	Required	Maximum projected dynamic generation response of the renewable resource over two minutes at a resolution one (1) second
9.	Protection AC and DC EWD	Required	
10.	Protection Three Line Diagrams	Required	
11.	Breaker (HV & Generator) and Isolating Device / Disconnect Control Schematics	Required	
12.	Tele-protection AC and DC EWD	Required	
13.	Breaker Failure Protection AC and DC EWD	Required	

14.	Interface Protection Relay / Fuse Co-ordination Study, Curves & Settings	Required	Generation Facility interface protection relay / fuse must co-ordinate with upstream Remotes protection relay / device
15.	Relay Logic Diagrams / Tripping Matrix	Required	
16.	<ul style="list-style-type: none"> • Verification of End to End Testing, • Registration for Generator License (If applicable) 	Required	
17.	Commissioning & Verification Procedure & Schedule	Required	
18.	Signed Band Council Resolution (BCR)	Required if Applicable	For Proponents hoping to install generation capacity in on a First Nation Reserve.

Notes:

1. The above list includes drawings that would generally be required for Generation Facility projects. Additional drawings / information may be required for certain projects. In such cases, Remotes will duly inform the Generation Facility.
2. For very small generation facility projects, some drawings / information may not be required. For example, those relating to tele-protection, GPR study, breaker failure, etc.
3. Remotes' review of Generation Facility drawing / data / protection settings & witnessing of commissioning tests etc. shall be limited only to those portions of the Generation Facility that interests Remotes and which interfaces with its distribution system.
4. The Generator shall be responsible to coordinate the design, installation, testing, operation and maintenance of its facilities in conformance with applicable codes, standards, Remotes connection requirements, service performance requirements and all relevant laws and regulations. The Generator shall obtain, at its expense, any and all authorizations, permits and licenses required for the construction and operation of its Generation Facilities.