

Prior to an applicants distributed generation project being connected to Halton Hills Hydro's (HHH's) distribution system, the applicant in working with HHH must complete Commissioning and Equipment Verification Report (Report) verifying the equipment is approved, tested with all A/C output inverters (or other A/C output devices) active, and suitable for connection.

The Applicant should submit their Commissioning Plan to HHH at least 5 business days prior to the commissioning test date. The applicant should note that HHH requires this Report to be signed and sealed by a Professional Engineer registered with the Professional Engineers of Ontario on the applicant's behalf.

In addition to testing required on the part of the Applicant to satisfy other regulatory agencies, HHH requires that Commissioning and Verification tests be performed per CSA C22.3 No. 9-08 "Interconnection of Distributed Resources and Electricity Supply Systems", IEEE 1547 "Standard for Interconnecting of Distributed Resources with Electric Supply Systems" and The OEB Distribution System Code Appendix F.2 "Technical Requirements".

This Report applies to distributed generation projects greater than 10kW. Field testing portions of this report shall be conducted by qualified individuals hired by the applicant.

Instructions for Completing this Report:

- The applicant shall contact HHH's Engineering Tech and present their Commissioning Plan at which time HHH's Engineering Tech shall fill in the grey areas of Section 1 "General Site Information" and Section 2 "Contact Information" as send this Report to the Applicant.
- The Applicant shall complete Section 1 "General Information" and Section 2 "Contact Information".
- During commissioning the Applicant will complete their portions of this Report after which HHH will complete their portions of the same Report.
- In Section 3 "Equipment Verification and Testing" the Applicant shall indicate a result of Pass, Fail, or N/A. Where a result of Fail or N/A is applied the Applicant shall provide notes as to the reason.
 - White area's are to be completed by the Applicant.
 - Grey area's are to be completed by HHH's Engineering Tech or an HHH representative.
- The Applicant shall record any deficiencies and resolutions of those deficiencies in Section 4 "Deficiencies and Resolutions". Where no deficiencies are found the Applicant shall check the box at the bottom of Section 4.
- HHH's Engineering Tech shall complete Section 5 "Electrical Safety, Site Access, and Agreements".
- The Applicants and their representative (P.Eng.) shall sign where indicated in Section 6 of this Report.
- HHH's Engineering Tech shall review the Report and once satisfied sign the Engineering Tech portion of Section 6 of this Report.

A copy of the completed Report shall be provided to the Applicant as well as filed in HHH's project file.

1	General Site Information	
Name of Applicant		
Name of Facility		
Proposed Energization Date		
HHH D.G. Designation		
Transformer/ Distribution Station		
Feeder Name		

2	Contact Information	
	Applicant Contact	HHH Engineering Tech Contact
Name:		Name:
Title:		Title:
Tel. #:		Tel. #:
Fax #:		Fax #:
Email:		Email:

3	Equipment Verification and Testing (Applicant) (All inverters must be installed and working during commissioning tests)	
Results: P = Pass, F = Fail, N/A = Not Applicable		
Item to be Verified	Result	Notes
Confirm output voltage of generator is no less than 7% below and no greater than 4% above nominal voltage (CSA C235-83, table 3) with clearing times per CSA C22.3 No 9-08. This shall be confirmed by monitoring voltage for 5 minutes with all inverters active.		
Check Phase Rotation (Generator)		
Under Voltage Protection (IEEE 27) working		
Over Voltage Protection (IEEE 59) working		
Confirm frequency is operating in the range of 59.4Hz to 60.6Hz (CSA C22.3 No 9-08). This shall be confirmed by monitoring frequency for 5 minutes with all inverters active.		
Under Frequency Protection (IEEE 81/O) working with clearing times per CSA C22.3 No 9-08		
Over Frequency Protection (IEEE 81/U) working with clearing times per CSA C22.3 No 9-08		
Maximum Harmonic Current Distortion is per CSA C22.3 No 9-08		
Power Factor per OEB DSC Appendix F.2, item 4		
All grounding is in accordance with the Ontario Electrical Safety Code at CSA C22.3 No 9-08		
Instrument Transformers are functioning within manufacturer tolerance (CT's/ PT's)		
Confirm Protective Relays/ Circuit Breakers are calibrated and functioning correctly.		
All Protective Schemes and interconnecting devices relating to loss of utility power function correctly		
Field installed power and control wiring compliant with specifications		

3	Equipment Verification and Testing Continued (Applicant) (All inverters must be installed and working during commissioning tests)	
Results: P = Pass, F = Fail, N/A = Not Applicable		
Item to be Verified	Result	Notes
Confirm Islanding Detection (ID, Anti-Islanding) functions and removes all generation sources from grid upon simulated utility power outage. This shall be confirmed by a field test once all inverters are actively outputting A/C voltage and current into the distribution system. Steady state production shall be monitored for 5 minutes. After 5 minutes the line side A/C switch will be opened for 1 minute, then closed. During the simulated utility outage the inverters output shall be monitored to ensure they do not produce power during the outage and also do not start producing power immediately when utility power is restored. Grid dependent inverters should not actively produce power until 5 minutes after A/C power is restored. After the inverters begin producing power, monitoring of voltage, current, and frequency shall continue for another 5 minutes.		
Monitoring Equipment that HHH has remote access to functions correctly (where applicable)		
Confirm Transfer Trip (where applicable): a) Ceases to energize the distribution system upon receiving a transfer trip signal, b) Ceases to energize the distribution system upon transfer trip communication loss.		
Inverter and related equipment is Certified to UL1741, IEEE 1547, and CSA Standards		
Ensure that all active sources of power production (ex. inverters) are on site and working (to be completed by an independent Professional Engineer hired by the applicant)		

3	Equipment Verification and Testing (HHH)	
Results: P = Pass, F = Fail, N/A = Not Applicable		
Item to be Verified	Result	Notes
Check Phase Rotation on Distribution System		
DG AC Disconnect is CSA/ ULC Approved, lockable, and accessible to HHH staff		
Meter base/ cabinet specified was installed		
ESA warning label "DG SYSTEM DISCONNECT" affixed to AC Disconnect		
ESA warning label "WARNING TWO POWER PARALLEL SYSTEM" affix to meter base/ cabinet.		
Inverter bares Certification Organizations emblem.		
Confirm that communication to HHH meter is working (may require office/ ODS assistance) Note: This check may occur following connection		
Check dial-in/ Ethernet connection to meter (if applicable) Note: This check may occur following connection		

3	Equipment Verification and Testing (Equipment Data)	
HHH	CT and PT Ratios for meter (400A and up):	CT Ratio: _____ PT Ratio: _____
	Meter Reading after Commissioning Complete (if applicable):	_____ kWh
Applicant	Customer Step-up Transformer Size (kVA):	Transformer Impedence:
	Transformer Manufacturer:	Manufactured Date:
	Transformer Serial Number:	
	Power Factor (>30kW, PF = ± 0.9):	<input type="checkbox"/> Leading _____ <input type="checkbox"/> Lagging _____
	Phase Rotation (from 0°):	R _____ W _____ B _____



4	Deficiencies and Resolutions	
	Deficiency	Resolution
1		
2		
3		
4		
5		
6		
7		
8		
	No Deficiencies were found at time of commissioning <input type="checkbox"/> (check)	

5	Electrical Safety, Site Access, and Agreements		
Item	Received (check)	Date (yyyy/mm/dd)	
If required for commissioning tests, ESA Temporary Connection Authorization per OESC 2-014			
HHH has received keys to access meter (where applicable)			
Letter from a Professional Engineer that is signed and sealed stating that the equipment and installation meets CSA, ESA, and all other applicable industry Standards.			
HHH has received copies of Applicants own commissioning and testing reports			

6	Completion of Report and Acceptance Sign-off's	
<p>By signing this Report the Applicant and their Representative acknowledges that all required verifications on their part have been completed and that the Applicants generation facility meets or exceeds the minimum industry design Standards, Regulations, and Laws for such a facility connected to a distribution system in Ontario.</p> <p>The applicant has submitted to HHH copies of their own commissioning and testing reports that may be included with this or separate from this Report.</p>	<p>_____</p> <p>Signature of Applicants Representative (must be a P.Eng.)</p> <p>Name (Print): _____</p> <p>Date (yyyy/mm/dd): _____</p> <p>_____</p> <p>Applicant's Signature</p> <p>Date (yyyy/mm/dd): _____</p>	
<p>HHH's Engineering Tech has reviewed the above Report and found the results and information provided to be acceptable to HHH. The project may move forward towards connection subject to all approvals/ documentation being in order prior to connection.</p>	<p>_____</p> <p>Signature of HHH Engineering Tech</p> <p>Name (Print): _____</p> <p>Title: _____</p> <p>Date (yyyy/mm/dd): _____</p>	