



NS05-25

Small scale generation connection standard

Network Waitaki Limited
10 Chelmer Street
PO Box 147,
Oamaru 9444

Telephone 03 433 0065
Facsimile 03 434 8845
service@networkwaitaki.co.nz
www.networkwaitaki.co.nz

1 DOCUMENT CONTROL

Author:	Craig Conlan - Network Development Manager
Owner and approver:	Shane Watson - GM Network

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Revision history	Description of Change	Date
Version 1	Rewrite, replacing NI 05/36 Distributed generation up to 10kW	Dec 2021

2 ACKNOWLEDGEMENTS

We thank Aurora Energy for generously allowing us to use their Small Scale Distributed Generation Connection Standard as a basis to develop this standard.

3 INTRODUCTION

3.1 Purpose

This document defines Network Waitaki’s requirements for the connection of small-scale (capacity less than 10 kW) inverter based distributed generation (SSDG) to our electricity distribution network.

3.2 Scope

This standard applies to all SSDG that connects via inverters including photo-voltaic panels, batteries, or electric vehicles with vehicle-to-grid (V2G) technologies.

3.3 References

AS/NZS4777.2:2020 Grid Connection of Energy Systems via Inverters

AS/NZS3000:2018 Electrical Installations (AS/NZ Wiring Rules)

Safety Manual Electricity Industry (SM-EI) latest version

Electricity Industry Participation Code 2010 (EIPC), Part 6

3.4 Definitions

Connected customer	This term has the same definition and meaning as defined for a “consumer” in the Electricity Act 1992, namely “...any person who is supplied, or who applies to be supplied, with electricity.”
Retailer	A party who purchases electricity and on-sells it to customers
ICP	Installation Control Point - the point where a retailer is deemed to supply electricity to a connected customer.
Inverter (grid tied)	An electronic device which converts DC from SSDG into AC and can export power into our network.
Small Scale Distributed Generation (SSDG)	Generation with a capacity less than 10 kW
Network Waitaki Ltd	Also referred to as NWL or where we use the pronouns “us”, “we”, or “our”.

4 NETWORK CONGESTION

We maintain a list of areas subject to congestion on our website <https://www.networkwaitaki.co.nz>.

Approval for connections at ICPs identified as having export limitations may include conditions such as export restriction under certain load conditions or enabling of Volt-VAR regulation.

Connections that will trigger a network upgrade may incur a congestion connection charge or an export charge. These will be assessed and allocated at the time of connection application.

5 GENERAL REQUIREMENTS

5.1 Connections

The connection of SSDG will follow the processes, timeframes and regulations as set out in the EIPC.

- Connections smaller than 5kW of export may be single phase.
- Connections greater than 5 kW of export must be three-phase.

SSDG applications will be approved within 10 days under a streamlined process if they are complete, comply with this connection standard, and are not in areas identified as having congestion and/or export limitations.

Our application process, including on-line application, is detailed on our website <https://www.networkwaitaki.co.nz>.

5.2 Inverters

Inverters must meet the following conditions to be eligible for the streamlined application process

1. Inverter based generation must comply with AS/NZS4777.2:2020 Grid Connection of Energy Systems via Inverters and have the voltage response modes listed in the next section.
2. Inverter based generation must be approved for use by the Clean Energy Council <https://www.cleanenergycouncil.org.au/industry/products/inverters/approved-inverters>

Inverters that do not comply with these conditions may need to provide further information and will not be eligible for the streamlined process.

5.3 Voltage regulation and response

Our voltage regulation objectives are:

- The SSDG will not actively regulate the voltage at the ICP, but the inverter will assist with voltage management through the provision of Volt-Var and Volt-Watt response modes.
- The SSDG will not cause the voltage at other installations on our network to rise above 243.8V

Voltage response modes should be enabled according to the following priority:

1. Volt-VAR and Volt-Watt response should both be enabled if possible
2. If both modes cannot be enabled simultaneously, the Volt-Var response should be enabled
3. If only the Volt-Watt mode is available this should be enabled

Reference values for voltage response modes are as defined for New Zealand in AS/NZS4777.2:2020 and shown below.

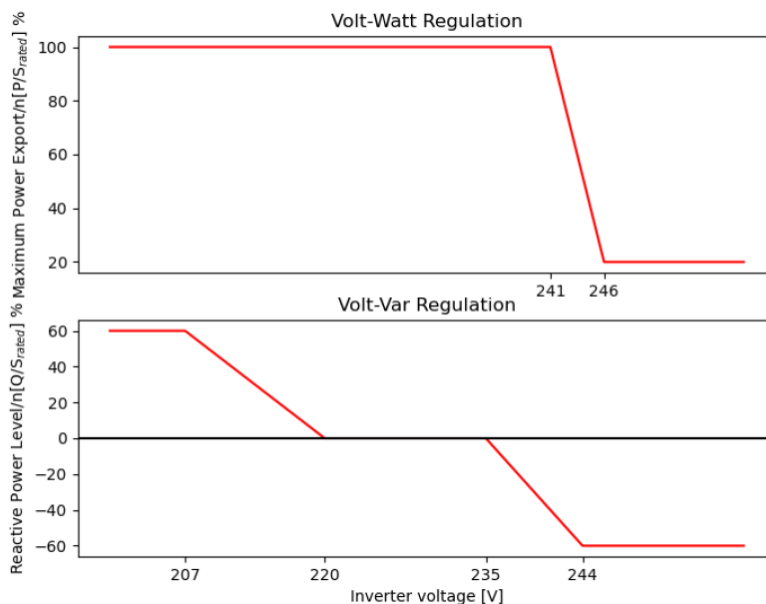


Figure 1 - Voltage regulation for inverters (AS/NZS4777.2:2020; applicable to NZ)

5.4 DC injection

The SSDG and its interconnection system will not inject a DC current greater than 0.5% of the full rated output current of the generation at the point of SSDG connection, in line with AS/NZS4777.2:2020 Clause 2.10.

5.5 Harmonics

The total harmonic current distortion (THDi) of inverter connected generation, for harmonics up to the 50th will not exceed 5% , in line with of AS/NZS4777.2:2020. Clause 2.7

5.6 Means of isolation

Every SSDG installation must have a means of isolation that can disconnect the SSDG from our network.

The isolation switch or circuit breaker must be suitably labelled and preferably be readily accessible. If the isolation switch is not readily accessible Network Waitaki will be provided with contact details and a means of access to enable immediate isolation in case of a fault.

5.7 Islanding

SSDG must not, under any circumstances, re-energise parts of our network that have been disconnected (islanded) from the rest of our network. The SSDG must have at least one method of anti-islanding protection which must always be fully functional.

5.8 Protection

We apply principles of Safety in Design and operate our network to achieve a high level of reliability and safety.

All SSDG installations shall have the following protection:

- Over and under voltage
- Over and under frequency
- Overcurrent

For inverter-based systems, compliance with AS/NZS4777.2:2020 will satisfy protection requirements.

Loss of grid protection must operate within 2 seconds of any limit being exceeded. Reconnection will not occur within 60 seconds of normal grid supply being established.

5.9 Earthing

The earthing of all SSDG installations will be in accordance with the requirements of AS/NZS 3000:2018.

6 INSPECTION AND TESTING

SSDG installations must have been inspected and approved for connection by an inspector authorised by us before power can be exported into our network. We may charge a fee of \$60 for inspections.

The owner of the SSDG will keep records of test results and protection settings and a copy of these records will be sent to us.

Periodic tests should be carried out to verify the settings and serviceability of protection.

7 METERING

Metering of the SSDG injection must be certified and comply with the requirements of the EIPC and record import and export of electricity separately.

8 COMMUNICATIONS AND OPERATION

From time to time there will be a need for us to contact SSDG owners and therefore we will have access to contact phone and email details, typically supplied through the retailer.

During normal operation of the network and during shutdowns for planned works we will not need to manually isolate SSDG and therefore access to the SSDG or the isolation device is not required on a day to basis but may be required in special circumstances.

9 RECORDS AND INFORMATION

We are responsible for ensuring that we have sufficient plans and records of SSDG installations to ensure the safe and reliable operation of the network.

9.1 GIS information

The SSDG owner will provide all necessary information required to facilitate recording the location and attributes of all SSDG plant and associated, switchgear, lines and cables on our geographic information system (GIS).

9.2 On site information

The SSDG owner will always have available at the SSDG site an up to date single-line diagram and protection schematic of the SSDG plant and will have manuals on the installation, operation, and maintenance of the SSDG equipment which will be made available to us if requested.

9.3 Testing and inspection

The owner of the SSDG will keep records on test results for the SSDG.

10 TIMEFRAMES APPLICABLE TO CONNECTION AGREEMENTS

Applications, installation, and operation of SSDG should proceed according to timeframes that meet the needs of our customers and are compatible with our planning and operational functions.

- For applications with compliant inverters and in uncongested areas we will acknowledge receipt within 2 business days and advise of approval or non-compliance within 10 business days (streamlined EIPC Part 1a process).
- For applications not eligible for the streamlined process, we will acknowledge receipt within five business days and advise of approval or non-compliance and any conditions within 30 business days.
- After receiving notice of approval for connection the customer must complete installation of the SSDG within 18 months or we may withdraw approval of the application.
- If changes to the network (including loads and generation) require us to impose changes to the operational requirements of SSDG, then the connected customer will be given 90 days to implement the changes.

11 CONNECTION CONTRACT

The *Regulated Terms for Connection of Distributed Generation* (Part 6) <https://www.ea.govt.nz/code-and-compliance/the-code/> will apply to all connections approved under this standard unless a unique connection contract is agreed between Network Waitaki and the connected customer within the Regulated Terms timeframes.

12 FEES

*Fees include GST.

Streamlined (EIPC part 1a) process

Application fee	\$115
Inspection fee	\$60

Non-streamlined (EIPC part 1) process

Application fee	\$230
Inspection fee	\$60