Northern Ireland Electricity Networks

Generation Compliance

SMALL SCALE GENERATION SCADA GUIDANCE DOCUMENT

01/08/2024

INTRODUCTION

The electricity industry is experiencing rapidly accelerating levels of change and development as a result of new innovative technologies, shifting customer opinions and demanding governmental policies. This has resulted in fundamental changes in the way electricity is generated, transported and utilized.

Northern Ireland had set and successfully achieved incredibly ambitious energy targets for Renewable Energy Sources for Electricity (RES-E) of 40% by 2020. A large measure of this performance has been demonstrated by 47.7% of electricity demand coming from RES-E in the 12 months up to March 2020.

In total 93% of this new generation has connected to the NIE Networks Distribution System. The increasing numbers of both renewable and traditional generation on the Distribution System has presented many technical engineering challenges for NIE Networks and SONI, the Transmission System Operator, such as bi-directional power flows, management of network voltages and inaccuracies in generation forecasting.

REQUIREMENTS

Many of these aforementioned issues can be remedied through the installation of Supervisory Control and Data Acquisition (SCADA) on generators.

Implementation of SCADA Systems will:

- Supply NIE Networks with real-time, high resolution data. This data will enable NIE Networks to more efficiently plan, operate and develop the electricity system.
- Allow for more accurate and granular generation forecasting to be completed to help to deliver efficiencies to the Wholesale Energy Market.
- Provide Alarms and Indications to NIE Networks surrounding the current status of generators. This information will assist with the safe operation of the Distribution System.
- Enhance the control of network voltage levels through Reactive Power management.
- Bring Small Scale Generators in line with Large Scale Generators.

All generators with a capacity greater than or equal to 100kW and connected to the Distribution System are required to install a Supervisory Control and Data Acquisition (SCADA) system. This was outlined in the NIE Networks Distribution Code 2010 (Issue 5) CC7.17. and has remained a requirement in all subsequent revisions of the Distribution Code.

Generators which meet all other criteria outlined in the Distribution Code but have not yet installed SCADA are presently non-compliant with the Distribution Code.

Generators which fail to comply with the Distribution Code, will be subject to NIE Networks Non-Compliance Procedures which can result in termination of the generator's Connection Agreement and subsequent de-energization and disconnection from the Distribution System.

SCADA will require each generator to accurately measure and communicate to NIE Networks the measurements and control signals outlined in Table 1. This list is not exhaustive and generators will require further signals or alarms. Full details of all signals and hardware requirements can be found in the SSG Settings Schedule (https://www.nienetworks.co.uk/about-us/distribution-code/ssg-setting-schedule).

Signal Name	Signal Type
Voltage (L1-L2/L1-L3/L2-L3)	Measurement
Phase Angle (L1/L2/L3)	Measurement
Active Power (kW)	Measurement
Reactive Power (kVAr)	Measurement
Power Factor	Measurement
HV Current[1] (L2)	Measurement
RTU Received Signal Strength Indication	Measurement
Toggle Control Mode (Voltage Control/Power Factor)	Control
Voltage Set-Point Instruction	Control
Phase Angle Set-Point Instruction	Control
RTU Control Switch	Indication
Control Mode	Indication
Customer G59 CB	Indication
Emergency Voltage Control	Alarm
G59 Protection Trip	Alarm
NVD Protection Trip	Alarm
AC Mains Fail	Alarm
RTU Local Comms Fault	Alarm

TABLE 1

[1] Required only for HV connected customers (>=6.6 kV).

COMPLIANCE PROCESS

NIE Networks have initiated a Small Scale SCADA Implementation Program to assist these generators with the SCADA installation process to ensure Distribution Code Compliance.

SCADA Commissioning involves the installation of a Remote Terminal Unit (RTU) at your generator. It is your responsibility to supply and arrange the installation and commissioning of the RTU. This is a specialist technical area which will require a suitably qualified and experienced engineer.

Due to the complexities of integrating RTUs to NIE Networks' SCADA Control System, NIE Networks have collated a list of verified SCADA Installers who have developed, tested and implemented an acceptable SCADA Solution. This list can be accessed using the following link: https://nienetworks.co.uk/ssg-scada-installers.

It will be the responsibility of each generator to agree and pay the costs for implementing SCADA with their SCADA Installers. The associated SCADA implementation costs incurred by NIE Networks were included in each generator's Generation Connection Offer. NIE Networks will not present any further costs to facilitate implementation between your installer and NIE Networks' own control systems.

To ensure your generator complies with the Distribution Code, NIE Networks request that the following actions are completed:

1. Engage a verified SCADA Installer to install and commission SCADA at your generator.
2. Confirm to NIE Networks that you have received the SSG SCADA Implementation Letter and that you have engaged and appointed a SCADA Installer. This can be completed online at https://www.nienetworks.co.uk/ssg-scada-reply-form or by post using the acknowledgement form and the return envelope.
3. Arrange an installation date with your chosen installer to visit your generator and complete the SCADA installation.
4. SCADA hardware is installed by a SCADA Installer at the generator. This will be in accordance with the SSG SCADA Setting Schedule available at https://www.nienetworks.co.uk/about-us/distribution-code/ssg-setting-schedule.
5. SCADA Installer will contact NIE Networks to establish a communications link to NIE Networks SCADA Control System.
6. SCADA Installer will liaise with NIE Networks to perform a SCADA Site Acceptance Test (SAT). This will determine if SCADA has been installed correctly at your generator. The SAT will ensure all required data and control signals are successfully communicated.
7. Upon successful completion of a SCADA SAT, a SAT Certificate will be issued to each generator..

THE DEADLINE FOR SCADA (INCLUDING REACTIVE POWER CONTROL) TO BE INSTALLED IS **31ST DECEMBER 2024**. ALL OF THE STEPS LISTED ABOVE MUST BE COMPLETED BY THIS DATE.

FREQUENTLY ASKED QUESTIONS

Will NIE Networks alter my generator's Active Power (kWh) output?

SSG SCADA for G59 connected generation does not provide the functionality for NIE Networks to directly alter a generator's Active Power output and subsequently reduce the energy (kWh) produced from that generator.

Similarly Reactive Power control does not impact Active Power output. This control is utilized to influence local voltages on the NIE Networks Distribution System in order to enhance the quality of supply for all connected customers.

What approach will be taken by NIE Networks to monitor my generator once connected to SCADA?

NIE Networks will perform software analysis on all SCADA connected generation on a weekly basis. This will determine each generator has operated within the limits and parameters outlined in its Connection Agreement.

Whilst no generator should exceed the limits outlined in their Connection Agreement, a small degree of occasional variance is permissible. The allowable threshold of this variance will remain under continuous review by NIE Networks.

Consistent violation of these limits, irrespective of variance, will be highlighted and will be investigated further by NIE Networks.

What happens if my generator disconnects from NIE Networks SCADA System?

NIE Networks have completed detailed cell signal coverage studies at each generator to determine signal strength levels for 2G, 3G and 4G communications. This has determined that the majority of individual generation sites have adequate coverage to ensure a robust connection to NIE Networks' SCADA System.

During NIE Networks routine monitoring of SCADA Connected generation, it will be made apparent if any generators have lost connection. Frequent or sustained connection failures will be fully investigated to determine the source of this issue.

SCADA and Reactive Power Control are continuous requirements. In the event that the current installation should fail, or a defect is identified by NIE Networks, this shall be considered non-compliance to the Distribution Code. NIE Networks would expect any defects with the SCADA installation to be rectified within a reasonable timeframe to be agreed with the generator.

I want to choose a SCADA Installer who is not on the list. Can I do this?

Generators who wish to use a contractor not on the verified list must first inform NIE Networks of their decision to do so in the Acknowledgement Form. The prospective SCADA Installer will subsequently be required to demonstrate a viable technical solution within 2 months of return of this Acknowledgement Form. NIE Networks will provide reasonable support to prospective SCADA Installers throughout this process.

If no viable technical solution can be demonstrated within this timeframe, then the generator will be classified as not having appointed a SCADA Installer.

Generators will be notified if this occurs and asked to confirm another SCADA Installer Appointment.

How do I know if my generator requires a SCADA installation?

NIE Networks have written to all G59 connected generators which require SCADA to remind them of this requirement. SCADA requirements were outlined in the quotation and final balance letters issued prior to connection of the generator. Any new generation/repowering applications will outline SCADA requirements in the Technical Terms document.

If a generator remains unsure of SCADA requirements at their site, they can contact NIE Networks who will inform them if a SCADA installation is required. Contact should be made via email to ssgscada@nienetworks.co.uk.

FURTHER INFORMATION

If you require further information and clarification surrounding any aspect of SSG SCADA, or wish to discuss the requirements with a NIE Networks Engineer via telephone, please contact NIE Networks' Generation Compliance Department by email at ssgscada@nienetworks.co.uk.