

## Summary of Changes Included in G83/2

ENA Engineering Recommendation (ER) G83/2, *Recommendations for the Connection of Type Tested Small-scale Embedded Generators (rated up to 16A per phase) in parallel with Low Voltage Distribution Systems*, was issued in December 2012. This document clarifies a number of requirements included in the previous version of the document (ENA ER G83/1-1) and it also introduces significant changes to the design and type testing requirements for small scale embedded generators going forward. These changes are summarised below:

### Clarification of Existing Requirements:

- a) The *Stage 1 Connection Procedure* also known as the “fit and inform process” is now called the *Single Premises Connection Procedure*. This procedure applies to connections of one or more generators at a single customer’s installation with a combined rating of no more than 16A per phase, each of which has been type tested to G83/1-1, G83/2 or G59/2-1. The *Single Premises Procedure* is not applicable where the installer has commissioned other generators within the *Close Geographic Region* within the last 28 days or where the installer plans to commission additional generation within the *Close Geographic Region* within the next 28 days.
- b) The *Stage 2 Connection Procedure* is now called the *Multiple Premises Connection Procedure*. This procedure applies where an installer proposes to install generation type tested to G83/1-1, G83/2 or G59/2-1 at more than one premises in a *Close Geographic Region* and, at each individual premises, the combined rating of the generators is no more than 16A per phase.
- c) A *Close Geographic Region* is defined as, “the area typically served by a single low voltage feeder circuit fed from a single distribution transformer. In a situation where this definition cannot be reliably applied by an installer, the installer can either confirm with the DNO (Distribution Network Operator) whether a proposed SSEG (Small Scale Embedded Generator) is within a *Close Geographic Region* or ensure at least one of the following criteria is met:
  - (1) The postcodes of any of the premises where a SSEG installation is planned by the same organisation are the same when the last two letters are ignored ... i.e. AB12xx, where xx could be any pair of letters or where x could be any letter
  - (2) The premises where any SSEG is planned by the same organisation are within 500m (i.e. 500 metres) of each other.”
- d) The 16A/phase threshold equates to 3.68kW/phase (i.e. based on the nominal voltage of 230V). Where an SSEG includes an inverter the SSEG rating is deemed to be the continuous steady state operating rating of the inverter.

### Technical Changes:

- e) The requirements for generator Interface Protection have been changed substantially, for example:
- Two stages of under voltage, over voltage, under frequency and over frequency protection are required.
  - Protection settings have been changed and are broadly based on the settings in ENA ER G59/2.
  - Operating tolerances for protection have been defined for the first time.
  - Type tests are much more closely defined and include tests for *operation* and *no operation*.
- f) The power quality requirements (i.e. for flicker, harmonics and dc injection) are much more closely defined. Changes include:
- Type tests for flicker, harmonics and d.c. injection shall be carried out on groups of generators with a combined rating of between 2kW and 4kW.
  - Results are normalised to a 3.68kW/phase rating.
  - Additional flicker testing is required for Wind Turbines.
  - The d.c. injection limit has been increased to 0.25% of the rating of the device (per phase) up to a maximum value of 20mA.
- g) Tests for short circuit contribution have been modified and are now also required for inverter connected generation.
- h) The Type Testing Annexes have been re-structured. There are now two general Annexes for testing *Inverter Connected Generators* and *Directly Coupled Generators*. A third Annex specifies additional requirements for particular generator technologies (e.g. PV, Combined heat and power, hydro, wind etc.).
- i) New Application forms, Commissioning Confirmation forms and Type test verification Forms etc. have been developed.

### Implementation of ENA ER G83/2:

It is recognised that equipment manufacturers and suppliers will require some time to implement the technical changes included in G83/2. For this reason generation rated up to 16A per phase that is connected by 1<sup>st</sup> March 2014 may either comply with G83/1-1 or G83/2 or G59/2-1\*. All generation connected after the 1<sup>st</sup> March 2014 must either comply with either G83/2 or G59/2-1\*. Further details are included in Guidance Note 2/4 of the *Distribution Code*.

The new under frequency and over frequency protection and operating requirements are relaxed for Stirling Engines connected up to 31<sup>st</sup> December 2012. Further guidance on this aspect is included in Guidance Note 3 of the *Distribution Code*.

\* Note, ENA ER G59/2-1, *Recommendations for the Connection of Generating Plant to the Distribution Systems of Licensed Distribution Network Operators* is applicable to all generators and generator connections that are outside of the scope of G83/1-1 and G83/2.