

# Stage 03: Report to the Authority

Grid Code

# A/10 Generator Compliance

## Volume 1 – Version 2

What stage is this document at?

01 Working Group Report

02 Industry Consultation

03 Report to the Authority

This proposal seeks to modify the Grid Code to ensure that the process relating to transmission connected generator compliance and its assessment, should be formally defined within the Grid Code

The purpose of this document is to assist the Authority in its decision of whether to implement the proposed Grid Code Modification.

**Published on: 01 December 2011**



**High Impact:**

NETS System Operator, directly connected Generators



**Medium Impact:**



**Low Impact:**

Directly connected Users and Distribution Network Operators

## Version 2

- 1.1 The original version of the A/10 Report to the Authority was submitted in August 2011. Following an initial consideration Ofgem wrote to National Grid and identified a number of questions, clarification and minor errors (including how the tracked changes had been presented and typographical errors).
- 1.2 Consequently, Ofgem has directed National Grid to submit an updated version of the Final Report with these clarification and errors addressed, which is achieved with this document, A/10 Version 2.

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## About this document

This Report to the Authority outlines a proposal to modify the Grid Code and contains the information required for The Authority to form an understanding of a defect within the Grid Code and the proposed solution in order to make a determination.

To modify the Grid Code a Modification Proposal must be taken to the Grid Code Review Panel (GCRP). This Modification Proposal will outline the background to the issue, how to address it, any impacts it may have on the industry and a recommendation for the GCRP to proceed to a Working Group or to an Industry Consultation.

The GCRP, based on the Modification Proposal, will determine if any further work or debate is required. If the group feels that the issue could benefit from further examination it will be progressed to a Working Group. Terms of Reference (ToR) will be created to outline the purpose and scope of the Working Group, as well as any timelines for reporting back to the GCRP. The Working Group will then meet to discuss the issue and produce a Working Group Report. This report is then presented to the GCRP to determine if the ToR have been met and that a robust solution has been developed to meet the defect within the Grid Code.

If the GCRP feels that the issue has already been investigated thoroughly and a robust solution has been developed, the Modification Proposal will progress to an Industry Consultation. Grid Code Industry Consultations last approximately one month but timescales can alter based on the complexity of the issue.

Following the conclusion of the Industry Consultation, a Report to the Authority is produced which takes into account any responses to the Industry Consultation and puts forward recommendations to Ofgem on how to address the defect within the Grid Code. The Authority then considers the issue and the proposed solutions to make a determination.

The revisions to the Grid Code proposed by National Grid and sent to the Authority require approval by that body and will, if approved, come into force on such date (or dates) of which Authorised Electricity Operators will be notified by National Grid, in accordance with the Authority's approval.



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### Any Questions?

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Proposer:

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A/10

Report to the Authority

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Version 1.0

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## 1 Executive Summary

- 1.1 NGET assesses the compliance of licensed generators with the relevant Grid Code requirements both during commissioning and throughout operational life. The assessment procedures are not formally currently codified but within Guidance Notes.
- 1.2 The Compliance Working Group was established to assess proposals to formalise these processes in the Grid Code. A review of the compliance arrangements for LEEMPS was also added to their remit.
- 1.3 A Grid Code Compliance Working Group Report was produced in 2009 and an initial Grid Code Consultation published in February 2010, to which 12 responses were received. The responses proposed a number of substantial revisions and consequently National Grid published a Further Consultation on the revised proposals.
- 1.4 The Further Consultation closed on 8th April 2011 with ten responses received. The responses had an overall consensus that the revised proposals were significantly improved and a broad support given. Some respondents still had concerns on the details in particular the Manufacturers Data and Compliance Report procedure, plus some additional comments on the detailed drafting.
- 1.5 The final proposed changes require amendments to the following Grid Code sections:
  - Glossary and Definitions
  - Connections Code
  - Operating Code
  - Data Registration Code
  - Planning Code
- 1.6 And the creation of a new Grid Code section, Compliance Processes, is also required.
- 1.7 National Grid recommends to the Authority that this proposal be approved.

## 2 Purpose & Introduction

- 2.1 Paragraph 2 of Condition C14 of the Transmission Licence granted to the National Grid Electricity Transmission plc ("National Grid") provides that National Grid shall, in consultation with Authorised Electricity Operators liable to be materially affected thereby, periodically review the Grid Code and its implementation. That paragraph also requires National Grid, following such review, to send to the Authority:-
- a report on the outcome of such review;
  - any proposed revisions to the Grid Code as National Grid (having regard to the outcome of such review) reasonably thinks fit for the achievement of the objectives set out in sub-paragraph (b) of Condition C14 of the Transmission Licence; and
  - any written representations or objections from Authorised Electricity Operators (including any proposals by such operators for revisions to the Grid Code not accepted by National Grid in the course of the review) arising during the consultation process and subsequently maintained.
- 2.2 This review examines proposed amendments to the existing Grid Code provisions relating to Generator Grid Code compliance and its assessment.

### Background

- 2.3 The Grid Code provisions specify, amongst other things, the requirements that apply to licensed generators connected to the National Electricity Transmission System (NETS) and Distribution Network Operator (DNO) networks and, through links in the Distribution Code, to License Exemptible Embedded Medium Power Stations (LEEMPS). These requirements relate to technical capabilities, the provision of planning data to NGET, and the submission of operational data. The provisions ensure that NGET is able to plan and operate the NETS in line with its Transmission License obligations.
- 2.4 Historically since vesting in 1990, NGET has assessed compliance with the Grid Code requirements of generators with which it has contracts, both during the commissioning of new plant and throughout the operational life of existing plant. The assessment procedures and tests are not formally specified in documentation under industry governance, but since the mid 1990s NGET has maintained and published Guidance Notes<sup>1</sup> (issued by NGET and made available to the industry on its web site) describing these procedures and tests in order to raise their visibility and ensure consistency.
- 2.5 Following discussions at the Grid Code Review Panel (GCRP), it was agreed that there will be benefit in formally defining a process that should be followed by NGET and generators in assessing and demonstrating compliance with the Grid Code provisions. The Compliance Working Group was established to agree proposals to achieve this.
- 2.6 Based on a request from the DNOs, a review of the compliance arrangements for LEEMPS, including a possible transfer to NGET of some

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<sup>1</sup><http://www.nationalgrid.com/NR/rdonlyres/6C036707-27A4-4C43-AD8A-777487AAAFF/28685/GuidanceNotesforPowerParkDevelopersIssue2September.pdf>  
<http://www.nationalgrid.com/NR/rdonlyres/B4DF2400-96FD-40E5-AF44-8DB88AADA5DF/28686/GuidanceNotesforSynchronousGeneratorsIssue11Septem.pdf>

of the compliance responsibilities, was included in the remit of the compliance working group. The Terms of Reference were agreed and these are shown in the Working Group Report, shown in Annex 1 of this Report.

## **Consultation Process and Chronology**

- 2.7 A Grid Code Compliance Working Group Report was produced in January 2009 setting out the proposed changes to the Grid Code, from which a Consultation Paper was duly published regarding the proposed changes. Following a final Working Group meeting to achieve consensus an amended version of the Working Group Report was re-issued by the Compliance Working Group members in December 2009.
- 2.8 An initial Grid Code Consultation was published in February 2010 and 12 responses were received. The responses proposed a number of substantial revisions and consequently National Grid published a Further Consultation to receive comment on the revised proposals before the composition of this Final Report to the Authority.
- 2.9 The Further Consultation closed on 8<sup>th</sup> May 2011.
- 2.10 This Report to the Authority contains all comments/responses received from Authorised Electricity Operators and other interested parties such as relevant manufacturers through both this Further Consultation and the original Consultation.
- 2.11 Where Authorised Electricity Operators' or other interested parties responses have been marked as confidential they will not be published within the version of the Report to the Authority placed on the National Grid website.

### 3 Description of Proposed Modification and its Effects

#### Impact on Grid Code

- 3.1 The final proposed changes require amendments to the following Grid Code sections:
- i. Glossary and Definitions
  - ii. Connections Code
  - iii. Operating Code
  - iv. Data Registration Code
  - v. Planning Code
- 3.2 The creation of a new Grid Code section is also required:
- i. Compliance Processes
- 3.3 The associated legal text for the Working Group recommendations is outlined in Appendix 6 of Volume 2 of this Report.

## 4 Initial Consultation and Responses

- 4.1 A Consultation on proposed modifications to the Grid Code Generator Compliance process was published on 1st February 2010 which closed on 18th June 2010, from which 12 responses were received from Authorised Electricity Operators (AEOs). These responses are shown in Annex 3 of this Report.
- 4.2 Upon reviewing all such responses, National Grid concluded that there was broad industry support for the proposals but that there were broad concerns expressed by several respondents in relation to the complexity of LEEMPS and the inclusion of the new process drafting within the Connection Conditions. To address these concerns major changes were necessary to the structure and layout of the drafting within the Grid Code and as a consequence, National Grid believed that the user community should have a further opportunity to review the proposals through a Further Consultation.
- 4.3 Consequently, it should be noted that the comments made by respondents to the original A/10 consultation will in many cases no longer be applicable as the proposals have been significantly updated. National Grid's replies, as shown in Annex 4, detail the specific responses to each comment received.

### DRAFTING CHANGES FOR THE FURTHER CONSULTATION

- 4.4 The following is a high level summary of the redrafting that was carried out following consideration of the comments received from the original A/10 consultation. The most significant change was to accede to the request to create a new Grid Code section, the "Compliance Processes" into which the majority of the text was transferred (from the CCs) with the exception of the testing detail which was relocated into OC5.
- 4.5 Operating Code 5 was extended to cover generator tests to demonstrate compliance as well as the existing facilities for NGET instructed tests on Users following monitoring. This was largely achieved through additional Appendices.
- 4.6 At the end of 2010 the Authority directed National Grid to include a "Generator Build" option for offshore transmission allowing the Generator to build and commission the network under the Grid Code prior to transfer of the network assets to the Offshore Transmission Owner. The Grid Code lays down obligations on the Generator in relation to both the plant which will later be transferred to an OFTO and the plant which will be retained by the Generator. The project will connect to the onshore system as a Generator. It is therefore appropriate that the connection is treated in the same way as any other Generator connecting to the system until such time as assets are transferred to an OFTO. The Licence requires National Grid to apply the Grid Code equally to all classes of User so the scope of the original A/10 proposal was updated to reflect the "Generator Build" arrangement.
- 4.7 National Grid also incorporated many of the detailed drafting improvements proposed by correspondents prior to the issue of the Further Consultation.

### LEEMPS

- 4.8 The original proposals within Consultation A/10 covered both generation with direct agreements with National Grid and LEEMPS. After reviewing the consultation responses and the responses to the other consequential code proposals that had been undertaken to the CUSC, DCUSA and Distribution Code, National Grid no longer proposed to specify a change to the LEEMPS

compliance process and therefore the revised drafting in the Further Consultation did not relate to this class of users.

- 4.9 A number of respondents commented on the removal of the LEEMPS element of the proposals and the majority expressed a view that the status quo was not acceptable and the DNO did not have the correct technical expertise to perform the LEEMPS compliance assessment.
- 4.10 At the July 2011 GCRP and July 2011 DCRP Panel meetings, both Panels have considered and accepted that a joint Working Group should be established to review the management of LEEMPS stations.

### **Industry information Session**

- 4.11 An industry information session was hosted by National Grid on 18th March, before the Further Consultation closed, in order to provide other industry parties with an interest a opportunity to discuss how the A/10 proposals changes between the original and the Further Consultation. Eight industry participants attended.

## 5 Further Consultation Responses

- 5.1 National Grid has consulted AEOs on the revised proposals, to which ten responses were received including two from other interested parties. All responses are included in Annex 5 of the Report to the Authority, along with National Grid's replies to each respondent, which are in Annex 6.
- 5.2 Respondent A/10-FCR 01 (CE Electric) focused comments on the previously issued LEEMPS elements. A strong view is expressed that NGET should undertake the LEEMPS compliance process as the DNO's do not have the correct specialised engineering skills. The respondent believes that some of the previously considered solutions could effectively be applied.
- 5.3 Respondent A/10-FCR 02 (EDF Energy) supports the proposal redrafting which increases the transparency of the compliance process and addresses their major concerns as expressed in their response to the original Consultation.
- 5.4 Respondent A/10-FCR 03 (E.ON UK) is pleased that National Grid had incorporated feedback from the original consultation and is now generally supportive of the proposals. Several observations were also provided concerning the certainty and time limitation of the Limited Operational Notification and believe the LEEMPS clarifications does not deal with the issue that DNO do not have the expertise to perform LEEMPS compliance assessment.
- 5.5 Respondent A/10-FCR 04 (REPower) made detailed comments on the proposed drafting focusing on technical aspects and drafting accuracy/clarity.
- 5.6 Respondent A/10-FCR 05 (RES) welcomes the intent of the proposals, namely the increased transparency of the Grid Code Compliance process. Detailed comments were also made across the proposals.
- 5.7 Respondent A/10-FCR 06 (RWE) stated that the revised proposals have been significantly improved since the original consultation and supports their aim. Detailed comments are also provided across the proposed drafting.
- 5.8 Respondent A/10-FCR 07 (Scottish Power) made the single observation that the Compliance Process section, as drafted, would have an unintended consequence where some Small Power Stations would be captured. This would occur where the unit's owner has a portfolio of generation which include both Small and Large Power Stations.
- 5.9 Respondent A/10-FCR 08 (SSE) believes that the proposals as a pragmatic solution and supports them as a pragmatic solution. Several suggestions were made to the drafting.
- 5.10 Respondent A/10-FCR 09 (UK Power Networks) commented on the LEEMPS element of the original consultation. The respondent believes that the current complexity of the LEEMPS connection process may limit the number of such generators on the system and supports that a Working Group is established to examine this area.
- 5.11 Respondent A/10-FCR 10 (Electricity North-West) deals with the LEEMPS element of the original Consultation only and is concerned with the proposal to drop that associated element. The response contains the history and background to how the current unacceptable situation was arrived at. The respondent concludes that the status quo (which the final proposal does not

change) is unacceptable and suggests that further discusses with National Grid and interested industry colleagues should be partaken.

## Summary of changes to proposed drafting in response to comments received

5.12 Listed below are the changes made in relation to the responses received to the A/10 Further Consultation:

### Connection Conditions

CC.3.3.2	Correct reference from CP.5.2.2 to CC.5.2.2
CC.A.7.2.4.1	The original drafting cross referenced to CP.A.3.2 which referred only to synchronous generator so a non-synchronous version of the provision based on CP.A.3.2 has been included as a new paragraph CP.A.3.2.2 with the original paragraph becoming CP.A.3.2.1.

### Compliance Processes

CP.A.1	removed the process numbers from the Appendix headings.
CP.3.1	clarified the scope to exclude all embedded small power stations.
CP.4.3.1	corrected the numbering of CP.4.3.2.
CP.6.3.1(e)	reference to CP7.5 to CP7.2
CP.7.2.3.	A reference to the Manufacturers Data & Performance Report has been added
CP.7.2.2(b) & (c)	Grid Code references to Excitation System model and voltage control system model Governor model and control system model added.
CP.7.2.2(d)	The text has been clarified with respect to the test not being required where generic testing has been accepted.
CP.6.6, CP.7.4, CP.8.1(ii)	Corrected spelling from “Convertor” to “Converter”
CP.8.3	The word “potential” has been inserted before “non-compliance” since non-compliance is not established in CP.8.1 to which this refers.
CP.8.4	Minor word changes to reduce external involvement in investigations to input from and discussion of conclusions with NGET and network Operators.
CP.8.5.4	Wording changed from Connection Conditions to Grid Code as clause relates back to CP.8.1 which refers to potential non-compliance with any provisions of the Grid Code, not just the Connection Conditions.
CP.9	Heading changed to Processes Relating to Derogations to avoid confusion in relation to clause CP.9.3.
CP.8.5.5	Additional wording included to indicate agreement with the Generator is needed for the timing of compliance tests needed to demonstrate restored capability.
CP.9.2	Additional clause added to cover for the possibility that Ofgem may not agree with the need to request a derogation.

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Proposal

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CP.10.1.3	To make it clearer that the first sentence is for information purposes only the phrase “must be” has been altered to “is”. National Grid agreed with the Working Group that it is inappropriate to specify a process in the Grid Code to be followed by Power Park Manufacturers who, as third parties, are not bound to comply with Grid Code.
CP.10.2 & CP.10.4	The scope of the Manufacturer’s Data and Performance Report has been reduced to the mathematical Model and FRT testing. Two respondents expressed concern over the transfer of information bypassing the developer so National Grid has reviewed the scope to limit this to only highly sensitive information. Discussion with the manufacturer who has gone furthest with generic type registration reiterated these two areas could compromise the commercial secrets of the manufacturer and that the manufacturer would not release full information in these areas. However, the manufacturer would give the developer a “black box” or “encrypted” model the same as provided in an “open” format to National Grid and did provide a simplified version of Fault Ride Through test report. Incidentally experience has also shown that it is not practical to use generic information for the frequency response and voltage control areas of compliance.
CP.10.4	has been redrafted to make it clearer that where a manufacturer has completed FRT testing under a Manufacturer’s Data and Performance Report tests on a developers site are not required.
CP.10.6	The drafting has been revised to reflect that the reference may be deemed invalid rather than permission has been refused.
CP.A.1.1	A note has been added below the figure to clarify that the process applies to the energisation of passive network assets and refers to the fact that additional compliance activities are required by Generators and DC Converter station owners.
CP.A.1.1, CP.A.1.2 and CP.A.1.3	APPENDIX 1 References to “Process 1”, “Process 2”, “Process 3” and “Process 4” deleted as they are not referenced as such anywhere else within the Grid Code.
CP.A.3.2(ii) and CP.A.3.5.1(i)	clarified meaning of “operating at maximum leading condition” by redrafting as “ operating at maximum leading reactive power import”.
CP.A.3.7.1	To avoid specifying retrospective requirements given the delay in the implementation A/10 the date of 1st January 2009 was amended to 1st January 2012.
OC5.A.1.3.5	The reference to section OC5.A.1.2.3 (ii) and (iii) has been corrected to OC5.A.1.3.3.
CP.A.3.6.1 & CP.A.3.7.7	Given the extended discussion and consultation on these proposals National Grid has moved the date for providing the load rejection simulation back one year to 2013.
CPA.3.2	Split of paragraph to give CPA.3.2.1 and CP.A.3.2.2 with separate simulation study requirements for synchronous generating units and non-synchronous generating units, power park modules and DC converters.

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## Glossary & Definitions

Compliance Statement	Change to wording to facilitate option to have a compliance statement in a format other than that provided by NGET provided the alternative format is agreed between NGET and User.
Compliance Processes	Connection Processes Corrected to Compliance Processes.
OTSDUW	definition improved by adding full title as used in the CUSC. i.e. Offshore Transmission System Development User Works
OTSUA	definition improved by adding full title as used in the CUSC. i.e. Offshore Transmission System User Assets
EON	Energisation Operational Notification or EON The term User is a defined term so the definition has been correct to make bold the term User on second line
LEEMPS/LEEMDCCS	Within the Glossary and Definitions the term LEEMPS/LEEMDCCS has been deleted. With very few references in the revised text consulted on, the existing text within the Grid Code for “Embedded Medium Power Stations not subject to a Bilateral Agreement and Embedded DC Converter Stations not subject to a Bilateral Agreement” has been reinstated.

## Operating Code 5

OC5.A.1.1	A typographical error “witnesses” corrected to “witnessed”
OC5.A.2	Title changed to Compliance testing of Synchronous Plant
OC5.A.3	Title changed to Compliance testing of Power Park Modules
OC5.5.4	National Grid has re-instated the previous wording relating to CC.6.1 compliance assessment.
OC5.A.3.5.1	Two grammatical errors corrected
OC5.A.3.7.3	The reference to section OC5.A.3.7.2 corrected to OC5.A.3.7.5.
OC5.A.3.4.7	An additional paragraph has been added to allow a reduction in Power Park Module reactive capability testing to be allowed at National Grids discretion where a Power Park Units reactive capability has been fully validated. This was requested by a respondent but the sense has been modified as a consequence of withdrawing reactive capability from the scope of the Manufacturer’s Data and Performance Report.
OC5.5.1	A typographical error “Instuction” corrected to “Instruction”
OC5.3.5	The table in OC5.3.5 is a summary of the requirements and it is noted that the explanatory paragraph preceding the table referring the reader to the wider Grid Code text was accidentally been deleted. This paragraph has been reinstated to aid clarity.

## Data Registration Code

Given the reduced scope of the Manufacturer’s Data and Performance Report the reference within DRC Schedule 14 has been removed

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Proposal

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Summary of additional changes:

CC.A.2.5.6	While dealing with a user comment relating to cross referencing in CC.A.7.2.4.1 for PSS simulations for power park modules it was noticed that the corresponding detailed simulation requirements for synchronous generating units had not been replaced by the cross reference to CP.A.3.2.1 where the corresponding simulation requirements had been included. This has been corrected by inserting the cross reference in CC.A.2.5.6 to avoid scope for confusion by having the simulation requirements appearing in two places.
CP.10.1.4	The date at which the manufacturers data & compliance report has been supplied has been deleted as this is not seen to be relevant.
OC5.A.1.3.1(b)	The Total Active Power (MW) and the Total Reactive Power (MVA <sub>r</sub> ) for an Offshore Power Park Module has been added as a Real Time on site or Down-Loadable signal to allow assessment of compliance against the requirements of the Bilateral agreement where the Offshore Power Park Module is contributing to voltage control or is maintaining unity power factor. This clarifies that the signals are still required for each Module offshore in addition to real time information at the Onshore Interface Point in accordance with OC5.A.1.3.3 following a query relating to a transitional project.
CP.7.2.4	This paragraph explains that offshore power park modules are required to do stability rather than voltage control & reactive capability tests where the power park module is not contributing to reactive capability. The paragraph has been clarified to include the cross referencing to Connection Conditions used in the sections detailing the tests (OC5.A.3.4.1, OC5.A.3.5.1 and OC5.A.3.8.2) to ensure consistency between the codes.

## 6 Impacts & Assessment

### 6.1 Impact on National Electricity Transmission System (NETS)

These proposals will have no material impact on the NETS beyond improving the confidence in the application of the Grid Code requirements.

### 6.2 Impact on Grid Code Users

These proposals will provide a high level of transparency within the Grid Code of the requirements associated with the compliance assessment process.

### 6.3 Impact on Greenhouse Gas emissions

The proposed changes are not expected to have any material impact on CO<sub>2</sub> and other green house gas emissions.

### 6.4 Assessment against Grid Code Objectives

National Grid considers that A/10 would better facilitate the Grid Code objectives overall, by allowing objective (ii) to be better met:

- (ii) to facilitate competition in the generation and supply of electricity (and without limiting the foregoing, to facilitate the national electricity transmission system being made available to persons authorised to supply or generate electricity on terms which neither prevent nor restrict competition in the supply or generation of electricity) ; and

By ensuring that the compliance assessment process to be used by NGET is visible to all generators and manufacturers, and by ensuring that the process applied is consistent for all.

### 6.5 Impact on Industry Documents

#### 6.5.1 Impact on core industry documents

Following revision of the proposals, relating to LEEMPS compliance, amendment is no longer anticipated to be required to the CUSC, DCUSA or Distribution Code. That withstanding, the impact of the new proposals will be assessed for each of these consequential code changes by following their respective code governance procedures.

#### 6.5.2 Impact on other industry documents

The proposed modification does not impact on any other industry documents.