

Grid Code Review Panel – Issue Assessment Proforma
Information on Small Embedded Generation and its Impact on Transmission System Demand

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Summary

The growth in the capacity of Embedded generation is having an increasing impact on the way the National Electricity Transmission System (NETS) is designed and operated. There was an estimated 7.6GW of embedded generation capacity installed in 2006 which is expected to grow to 11.3GW in 2015. This now offsets a significant proportion of the demand presented to the Transmission System.

High embedded generation output means that less Demand is seen on the Transmission System. When embedded generation output is low, observed Demand is higher. This is the case both for Active Power and Reactive Power Demand and can impact on local reinforcement and asset replacement requirements as well as wider boundary transfers.

A change to PC.A.4 has been developed for this document as an example for discussion. The change would add a requirement for the submission of additional data in regard of Embedded Small and Medium Power Stations and amendment of the related deductions made in the User's existing Demand submission would provide essential additional information. This paper recommends that interested parties should be brought together to review current arrangements in this area and develop proposals for appropriate changes

Users Impacted

High - None Identified

Medium - Network Operators

Low - None Identified

Description & Background

The information provided under the Grid Code has been specified to ensure that National Grid can meet its statutory obligations in planning and operating the National Electricity Transmission System. However, the information items exchanged do not fully capture the volume and variability that National Grid as the National Electricity Transmission System Operator is now seeing in Embedded generation, and expects to see in the future.

The existing data is appropriate for the evaluation of high Demand conditions in areas with low levels of Embedded generation. Where the capacity of Embedded generation is high, there is the risk that Transmission System capacity may be inadequate in situations where Embedded generation is running at high or low output levels.

¹ The Code Administrator will provide the paper reference following submission to National Grid.

One possible approach is to change PC.A.4 to add a requirement for the submission of additional data. The new data concerns Embedded Small and Medium Power Stations and the related deductions made in the User's existing Demand submission in respect of PC.A.4.3.1(b); Connection Point Demand at NETS Peak. This would allow the Demand seen by the transmission system to be represented more effectively by supplementing the information supplied under PC.4.3.2(d) (the User's opinion of the largest Demand that may reasonably be placed on the NETS) and would allow Embedded generation to be considered in a manner consistent with that applied to Transmission connected generation. The provision of this data would enable better Transmission System capacity planning and would promote the efficiency and security of the Transmission System.

Some Users already provide this information and thus such a change could standardise the requirement and enable National Grid to make better use of the data requested. The requested additional data items are predominantly available in the current Distribution Code (DPC7.3.2 and Schedule 5e). One additional refinement is the inclusion of generator 'fuel type' information in order that different generators may be set to varying availabilities.

Proposed Solution/Next Steps

It is proposed that a working group comprising National Grid, Network Operators and any other interested parties should develop a consensus on a set of changes to the existing PC and DRC that facilitate change.

The group could also usefully consider information relating to Reactive Power exchange at the boundary between the Transmission and Distribution networks. Additionally, the group could consider the most effective way to capture the necessary information. For example, does a 1MW threshold strike the right balance in providing enough detail (to capture solar PV for instance) without presenting an excessive burden on Users? There may be more effective ways to exchange the necessary data given current practice in Network Operators which a working group could develop.

Impact & Assessment

Impact on the National Electricity Transmission System (NETS)

National Grid has not identified any impacts that the proposed modification will have on the National Electricity Transmission System.

Impact on Greenhouse Gas Emissions²

National Grid has not identified any impacts that the proposed modification will have on Greenhouse Gas emissions.

Impact on core industry documents

The proposed modification does not impact on any core industry documents

Impact on other industry documents

The proposed modification may have some impact on the Distribution Code (DCode).

² The most recent guidance on the treatment of carbon costs under the current industry code objectives can be found on the Ofgem website at: <http://www.ofgem.gov.uk/Licensing/IndCodes/Governance/Pages/Governance.aspx>

Assessment against Grid Code Objectives

Will the proposed changes to the Grid Code better facilitate any of the Grid Code Objectives:

- (i) to permit the development, maintenance and operation of an efficient, coordinated and economical system for the transmission of electricity;

The proposal better facilitates this objective by providing the information required to forecast the demand presented to the transmission system

- (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);

The proposal is neutral on this objective.

- (iii) subject to sub-paragraphs (i) and (ii), to promote the security and efficiency of the electricity generation, transmission and distribution systems in the national electricity transmission system operator area taken as a whole; and

The proposal better facilitates this objective by providing the information required to forecast the demand presented to the transmission system

- (iv) to efficiently discharge the obligations imposed upon the licensee by this license and to comply with the Electricity Regulation and any relevant legally binding decisions of the European Commission and/or the Agency.

The proposal is neutral on this objective.

Supporting Documentation

Have you attached any supporting documentation

YES

If Yes, please provide the title of the attachment:

Proposed Grid Code Drafting

Recommendation

The Grid Code Review Panel is invited to **approve this issue for progression to a Working Group**.

GCRP Decision (to be completed by the Committee Secretary following the GCRP)

The Grid Code Review Panel determined that this issue should:

INSERT GCRP DECISION

Proposed Grid Code Drafting

The text below illustrates the changes required to the Grid Code to implement the change outlined above. New text is shown in red.

PC.A.4.3.2 All forecast **Demand** specified in PC.A.4.3.1 shall:

(a) be that remaining after any deductions reasonably considered appropriate by the **User** to take account of the output of all **Embedded Small Power Stations** and **Embedded Medium Power Stations greater than 1MW** and **Customer Generating Plant** and imports across **Embedded External Interconnections** and such deductions should be separately stated **and include**;

- (i) Generator name
- (ii) maximum Real Power output (MW)
- (iii) output assumed under PC.A.4.3.2(c) for the date and time of annual peak National Electricity Transmission System Demand
- (iv) name of Connection Point(s) to which the Embedded Power Station ultimately connects
- (v) name and voltage of distribution substation nearest to the Embedded Power Station which is detailed in the Single Line Diagram submitted under PC.A.2.2.2
- (vi) Generator fuel type
- (vii) year of connection of Generator
- (viii) where the sum of Embedded Small Power Stations of less than 1MW summate to 5MW or more, this total shall be stated