



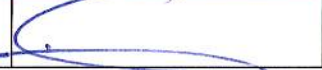


GB Grid Codes for Wind Energy

December / January Monthly Report

Econnect Project No: 1294

Prepared For	BWEA Renewable Energy House 1 Aztec Row Berners Road London N1 0PW
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	Name	Date	Signature
Prepared By	S. Cowdroy	1/2/2005	
Checked By	A. Oliver	2/2/2005	
Approved By	G. Nicholson	2/2/2005	

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2	Econnect (Client File)	Econnect Ltd
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1 Scope

Econnect is carrying out work for the British Wind Energy Association (BWEA) funded under a contract agreement DG/DTI/00035/00/00 between the Secretary of State for Trade and Industry and the BWEA.

A key deliverable of this contract is a monthly report to the BWEA members on key Grid Code issues and developments. The fifth of these monthly reports is presented in Appendix A in a format suitable for dissemination by the BWEA to its members.

2 Appendix A - GB Grid Code Representation for Wind Energy Monthly Report for December 2004 & January 2005

2.1 Grid Code Consultations

2.1.1 H/04 & SA/2004 Changes to Incorporate New Technologies

Ofgem published their response to these consultations on the 17th January along with the results of their Regulatory Impact Assessment (RIA). Following the recommendations of Ofgem's consultant SKM, a number of supplemental changes have been made to the original proposals, and these changes are part of an ongoing consultation that closes on the 28th February. Econnect have prepared a review of these supplemental changes, which will be circulated to BWEA members for comment, prior to submission of a formal response to Ofgem from the BWEA on the 28th February.

The three key conclusions from Ofgem's RIA¹ are that: -

- There is a general agreement in the industry (Forum discussions confirmed that all affected parties support this view) that changes to the GB Grid Code to include wind generation are required as the original drafting of the GB Grid Code made the implicit assumption that all generators connecting to the transmission system would be synchronous plant.
- Ofgem is therefore minded to agree that the GB Grid Code needs to be updated to recognize explicitly the particular characteristics of non-synchronous generating plant that parties are now seeking to connect to the transmission system at an increasing rate.
- Ofgem has assessed the impacts of National Grid Transco Company's (NGT) and the Scottish Transmission Licensees proposed changes (including the Supplementary Changes) to the GB Grid Code and found there to be no significant adverse impacts on generators currently connected to the network or those having signed connection agreements. Those parties that are in the process of negotiating connection agreements have been advised of the development of these Grid Code proposals. No other parties connected to the grid are affected.
- In conclusion this Impact Assessment is supportive of Ofgem's 'minded to' decision letters relating to the H/04 and SA/2004 Reports to the Authority.

2.1.2 T02/04 BETTA Go-Live cut over requirements

This consultation² deals with aspects of the GB Grid Code that will need to be enabled prior to 1st April 2005 (Proposed BETTA Go-Live Date), particularly with regard to Scottish Generators, to ensure a smooth transition at midnight on the 31st March 2005. Basically this consultation includes changes to Balancing Code 1 and 2 and Operating Code 7, which deal with information exchange between NGT as the system operator and the Scottish Generators.

¹ Proposed Grid Code Modifications H/04 and SA/2004 Impact Assessment OFGEM (JAN 2005)

² T02/04 Transitional Consultation Paper – Grid Code – BETTA Go-Live cut over requirements National Grid Transco (JAN 2005)

In particular:

BC1: proposed activation time 11:00hrs 31st March 2005

Provides for the submission of data necessary for the operation of the Balancing Mechanism, and the planning of the Transmission Network at the day ahead stage.

BC2: proposed activation time 23:00hrs 31st March 2005

Allows NGT to issue Bid/Offer Acceptances to Scottish Balancing Mechanism Units immediately post BETTA go-live.

OC7.4.8: proposed activation time 11:00hrs 31st March 2005

Ensures Scottish Users will receive the appropriate system warnings, if any were issued prior to Go-live.

2.2 Communication of Grid Code Requirements to members

At General Electric's (GE) request, Guy Nicholson met with Gary Moore of GE to summarize the requirements of the GB Grid Code. Guy provided the context of the Grid Code, explained that the GB code was not yet in force and how the Scottish + England & Wales codes were being merged along with an analysis of the various Grid Code consultations and expectations with regard to Grid Code changes for wind. Overall the comment from Gary was that the meeting was very helpful. Such meetings fall under Econnect's remit from the BWEA as the Grid Code representative for Renewable Generation, and can be arranged with other BWEA members upon request.

2.3 Overseas News

2.3.1 Ireland

A meeting was organised by Electricity Supply Board (ESB) on 15th December to discuss the validation requirements of dynamic models and grid code compliance for wind turbines in Ireland, and particularly low voltage ride through (LVRT). A number of Turbine Manufacturers who also attended presented the details of their own in house modelling and testing with a view to demonstrating compliance. There was a high degree of correlation between the modelling and test outputs, demonstrating that it was possible to successfully match models with test results. However, the reliability of models in predicting wind farm performance was questioned, especially given the interactions of turbines, wind farm collection systems, ancillary plant and networks. It was also noted that the wide range of parameters that could come into play (e.g. turbine operating variable, network status) makes it virtually impossible to ensure that all potential scenarios have been modelled.

2.3.2 Germany

Deutsche Energie Agentur (DENA) (The German Energy Agency) has commissioned a fundamental research paper, which has examined the effects the further development of renewable sources would have on the German national grid and Germany's power stations in the future. It is hoped that this paper will provide a reliable basis for discussion and decisions in respect of the design of the general conditions for the power stations of the future.

The central aim of the research was to develop a strategy regarding the optimization of Germany's power stations for both fossil and renewable energy sources, with special focus on the integration of wind farms – both at sea and on land – into the German power grid and with reference to the general international conditions.

The paper is divided into three parts whose main focus is as follows:

- Development of energy scenarios in which the proportion of renewable power stations and the electricity generated by them, and the development of the conventional power station is established for the years 2007, 2010 and 2020.
- Examination of the effects this would have on the national grid, with a special focus on the reinforcement and extension measures required and on grid management.
- Development of the systems requirements in the power stations with the main focus on the optimum provision of normal and contingency reserve energy.

A joint summary of the findings was agreed on the 17th January (though these are yet to be published), however the study as a whole is yet to receive final approval. In a press release on the project's progress dated 18th January, Thorsten Herdan, Manager of VDMA Power Systems, who were on the project steering committee, stated that "The results of the study so far have provided evidence that even the wind energy capacity predicted for the year 2015 can be integrated into the electricity grid, without jeopardising safety. Technical solutions exist to ensure this."³

2.4 License Exempt Embedded Power Stations Working Group (LEEMPSWG)

A meeting of the LEEMPSWG was held on 28th January and was attended by Guy Nicholson. The LEEMPSWG's aim is to remove the necessity for 50-100MW Licence exempt generators to have a Bilateral Agreement (LEGA Licensed Exempt Generation Agreement) with NGC. It is proposed that changing the Distribution Code in order to pass through the relevant requirements of the Grid Code will facilitate this. The Distribution Network Operator can then police the requirements.

Probably the largest number of LEEMPS are in Southern Scotland in the 5-30MW range (including five windarms i.e. Hare Hill, Hagshaw Hill, Dun Law, Windy Standard & Ardrossan). Most of these power stations are assumed not to have any of the proposed or existing GB Grid Code capabilities, and NGT stated that they would seek derogations from the requirements for these stations, as the system operates quite successfully under the current arrangements.

³ Bundesverband WindEnergie Press Release DENA Study: Optimal Integration of Wind Energy into the Grid is possible BWE (18th JAN 2005)

There are no Medium Power Stations in the North of Scotland as they are either Small (<5MW) or Large (>5MW). The present arrangements will mean that the Large Power Stations will still have a Bilateral Agreement with NGT even when they are embedded in the Distribution Network.

Operating Code 5 of the Grid Code deals with Testing and Monitoring. NGT stated that there would be no ongoing monitoring of Medium Power Stations once they were satisfied that the Connection Conditions had been met. Therefore it was agreed that the requirements to demonstrate compliance should be explicitly written in Operating Code 5.

If the tests impose costs on the generator (including loss of ROCs) it is proposed that these are to be reimbursed by NGT through the Distribution Network Operator (DNO), as the DNO is obliged by the Connection Use of System Code (CUSC) to use reasonable endeavors to secure testing.

The Grid Code, CUSC and Distribution Code drafting by the Working Group is under further re-review due to other industry changes taking place. The next drafting will have to take account of the current Grid Code modification proposals for new generation technologies consultation⁴. The plan is for the proposed changes to be considered at the next LEEMPSWG on 14th March and presented at the GB Grid Code Review Panel on 19th May, from where they will go out to consultation.

2.5 GB Grid Code Revisions

The GB Grid Code (Issue 3) came into effect on 1st September 2004 at the beginning of the BETTA transition period that will extend until the BETTA go-live date of 1st April 2005. Most of the provisions in the GB Grid Code that relate to Scotland are 'switched off' until the go-live date, as the Scottish Grid code remains in effect until that time, however Ofgem retain the right to activate any of these provisions as they see fit during the transition period.

There have been four minor revisions to the GB Grid Code since 1st September.

a) Grid Code Issue 3 Revision 1 Effective from the 4th October 2004

Revision 1 is modified as a result of Consultation F/04 (Development of Maximum Generation Service). Basically the change is that this service will now be utilised in accordance with the terms of the CUSC rather than the Maximum Generation Service Agreement.

b) Grid Code Issue 3 Revision 2 Effective from the 11th October 2004

Revision 2 is modified as a result of Consultations A/04 (Changes to Data Validation, Consistency, and Defaulting Rules) and G/04 (Changes to Operating Codes 1 & 2). Both are minor changes and do not appear to have any implications for wind.

⁴ Proposed Grid Code Modifications H/04 and SA/2004 Impact Assessment OFGEM (JAN 2005)

c) *Grid Code Issue 3 Revision 3 Effective from the 29th November 2004*

Revision 3 is modified as a result of Consultations F/03 (Changes to Operating Code OC2 – Outage Planning), E/04 (Further changes to Grid Code OC2) and D/04 (Grid code compliance issues with refurbishment of plant). It has also updated the Grid Code to include requirements associated with Cascade Hydro Schemes.

F/03 and E/04, update the obligations to more fully reflect the current practices, changing most pages of OC2. F/03 updates generation and transmission outage planning by clarifying requirements regarding data records and timescales, together with general updates to improve ease of reading and remove redundant text. E/04 clarifies that for the 2 to 49 day ahead period generators should provide National Grid with an estimate of daily output usable forecasts, on a Genset basis.

The changes resulting from D/04, have updated section OC5 “Testing and Monitoring”, enabling the addition of a process to check that plant items that have been refurbished or replaced comply with Grid Code requirements, and to demonstrate delivery of Ancillary Services.

Additionally changes have been made to define the Cascade Hydro terms “Cascade Hydro Scheme” and “Cascade Hydro Scheme Matrix”. A Cascade Hydro Scheme being defined as:

“Two or more hydro-electric Generating Units, owned or controlled by the same Generator, which are located in the same water catchment area and are at different ordnance datum’s and which depend upon a common source of water for their operation”

Requirements on such schemes have been included in the Planning Code, Connection Conditions, OC2, OC5 and Balancing Codes 1 and 2 sections of the Grid Code.

d) *Grid Code Issue 3 Revision 4 Effective from the 19th January 2005*

The Revision 4 changes arise from the implementation of modifications proposed in Consultation Paper T01/04 for Scottish Generators to provide planning data to NGC in advance of BETTA Go-live,

(Provision of OC2 data under OC2.4.1.2.3(a) and OC2.4.1.2.4.(b))

1. An additional paragraph has been included in the General Conditions (GC.A2.12) to activate OC2.4.1.2.3 (a) and OC2.4.1.2.4 (b) to require Scottish Users to comply with such requirements to send 2 to 52 week, 2 to 7 week and 2 to 14 day Generation forecast data to NGC.

2. The submission in respect of each of the above need only be that data applicable from go-live e.g. the first 2 –14 day submission starting on 22 March 2005 need only include information starting from 1 April 2005.