

GB SQSS REVIEW REQUEST

DATE: 22/02/2008

1. Title of review request
Review of Infeed Loss Limits
2. Name of Proposer (<i>include name of contact person</i>)
EDF Energy plc, Denis Linford, Director of Regulation
3. Proposer Contact Details ¹
40 Grosvenor Place, London, SW1X 7EN, telephone 0207 752 2200, email Denis.Linford@edfenergy.com , FAX 020 7752 2128, mobile telephone 07875 110051
4. Description of issue(s)/Defect(s) to be addressed by the request
<p>Currently, the GB SQSS limit for Normal Infeed Loss Risk is set out in sections 2.6.1 to 2.6.3 of the SQSS document and is the level of loss of power infeed risk covered by fault outage on any single transmission circuit, generation circuit and planned or fault outage on any single section of busbar or mesh corner. This currently stands at 1000MW. The SQSS Infrequent Infeed Loss Risk is set out in sections 2.6.4 to 2.6.6 of the SQSS document and is the level of loss of power infeed risk which is covered following the concurrent fault outage of any two transmission circuits, any two generation circuits on the same double circuit overhead line, any single busbar section circuit breaker or mesh circuit breaker, or the loss of any single transmission circuit or section of busbar during the planned outage of any other single transmission circuit or busbar). This currently stands at 1320MW.</p> <p>The definitions of each limit include the words “until reviewed” indicating that these parameters are designed to be changed from time to time. These limits have not been changed since at least 1990.</p> <p>The infeed limits specified in the GB SQSS were established for the system that existed at that time and have evolved as the characteristics of generation and the transmission system have evolved. The GB electricity industry is facing substantial investment in new generation capacity over the coming decade as a significant proportion of the current generation fleet needs to be replaced.</p> <p>It is likely that future designs for thermal generation plant will not be consistent with current SQSS limits. This could discriminate against more efficient large plant and will almost certainly discriminate against the most efficient options for medium-term nuclear build. The designs currently being considered in the nuclear regulators’ GDA process all have generating unit sizes greater than 1000MW.</p> <p>The current infeed limits are therefore no longer consistent with the range of generation technologies that could be built in Great Britain in the foreseeable future and consequently a review of the infeed limits is now required.</p>

5. Description of the review request, its nature and purpose

The review request aims to increase the Normal and Infrequent Infeed Loss Limits such that an alternator of greater size than is currently offered a standard connection can be connected to the GB transmission system under a standard bilateral connection agreement. This will reflect the economic and social desirability of efficient forms of large scale power generation and ensure that the cost allocation of reserve provision is also consistent with this. We do not consider that Design Variation Connections would adequately resolve the existing barrier to efficiency.

We suggest the following as possible areas for consideration by a review working group:

- Analysis of balancing services associated with having several larger plant connected to the system relative to the possible characteristics of the system, including other technologies and deeper interconnection, around 2020 and subsequently.
- Analysis of the efficiency benefits of connecting larger plant to the system.
- Analysis of barriers to efficient entry for larger plant.
- Assessment of likely changes in reserve requirements as a result of expected evolution of the GB generation mix to around 2020 and in subsequent years.
- Analysis of the benefits that many large steam turbine plants would have, including carbon emissions avoidance and security of supply issues compared to a reliance on gas-fired generation.

6. Impact on the GB SQSSⁱⁱ

6 (a) Parts of the GB SQSS that require amendment to give effect to the request

Normal Infeed Loss Limit and Infrequent Infeed Loss Limit to be reviewed to properly and efficiently accommodate new generation technologies with the potential for installation in Great Britain beyond 2017. This will require an amendment to the levels of 'Normal Infeed Loss Limit' and 'Infrequent Infeed Loss Limit' as set out in Section 7 'Terms and Definitions' in the GBSQSS.

6 (b) Parts of the GB SQSS that would otherwise be affected by the request

Consequential changes may be required to the definitions of infeed limits.

6 (c) Nature and contents of amendments or effects

To increase the Normal and Infrequent Infeed Loss Limits such that generation units with large alternators of up to 1800MW can be connected to the GB transmission system in a manner that is consistent with SQSS standards.

7. Justification of the request, giving the background thereofⁱⁱⁱ

Historically, as technological evolution has brought larger generating units onto the

system, the SQSS has also evolved to accommodate these units, for example, the IFA interconnector (where co-entrenchment of dipoles means up to 1000MW could be lost in one instance) and the introduction of the 1320MW Sizewell B plant. Thus, SQSS limits in the past have not acted as a block on the application of new technologies; they have evolved so as to remain reflective of the then current generation technologies.

Changes in international generation designs now mean that standard alternator sizes can exceed 1000MW (the Normal Infeed Loss limit). Projects with turbines exceeding 1000MW are being developed and are under construction or are already operating in Europe, including :

- 2 x 1050MW lignite plant in Neurath, Germany expected for 2009/10
- 1100MW coal plant in Datteln, Germany expected 2010
- 1450MW upgrade of nuclear plant in Sweden and 1650MW nuclear plants in France and Finland
- 4 x 1450MW nuclear plants are operating in France.

The balance of generation plant connected to the GB Grid and the nature of the Transmission Network itself are both changing, and the Grid Rules are altering to recognise these changes. For example :

- In the latest forecast for incentivised balancing costs, the SO expects additional reserve and frequency response costs of £10m to accommodate 500MW extra wind capacity in 2008/9. These costs have been charged to users on a £/MWh basis, as is always the case with reserve costs and other elements that make up BSUoS. With total wind capacity expected to exceed 20 GW by 2020, significant increases in required levels of reserve as well as far greater utilisation of reserve options of fast-response plant and of pumped storage are expected.
- The Offshore SQSS accommodates offshore wind transmission connections, which do not have to be fully redundant. A similar situation prevails in Scotland (as a system as a whole) with some boundary circuits having derogations¹ against the SQSS and many generation connections in SHETL transmission regions being non-standard in relation to SQSS.

These examples help illustrate how Grid Rules are not static but develop over time as the GB power system undergoes significant change, and how current infeed limits in SQSS do not fully reflect the value to society of both system security and large volumes of low carbon generation. So that the transmission licensees can meet their statutory duty to develop, maintain and operate an efficient, economical and coordinated system of electricity transmission, the transmission system must be fit for purpose for all its users. As users of the system look to invest in the latest

¹ http://ofgem2.ulcc.ac.uk/temp/ofgem/cache/cmsattach/8777_19604_NGT.pdf?wtfrom=/ofgem/whats-new/archive.jsp (Paragraph 7)

http://ofgem2.ulcc.ac.uk/temp/ofgem/cache/cmsattach/7018_national_grid.pdf?wtfrom=/ofgem/whats-new/archive.jsp (Item VI on page 4)

generation technologies, so the transmission system and the rules that govern it need to evolve to accommodate these new technologies.

Furthermore, the transmission licensees are obliged to facilitate competition in generation. The SQSS currently represents a barrier to entry for some new generation technologies.

The transmission licensees are also required to ensure an appropriate level of security and quality of supply and safe operation of the transmission system. Aside from ensuring that the transmission network itself is secure, safe and reliable, the transmission licensees must also facilitate the development of generation assets which contribute to the overall security of the GB electricity supply industry. Where an unmodified SQSS creates a barrier to efficient entry of new generation technologies, there is a risk that medium to long-term security of supply will be threatened. Also, future increases in transmission interconnection capacity may leave current SQSS limits obsolete.

Facilitating secure supply and contributing to meeting medium-term carbon reduction targets are key objectives of energy policy. It is likely that large plant such as nuclear reactors will play a significant role in meeting these security of supply and carbon reduction goals. This is demonstrated in the 2008 Government White Paper on Nuclear Power, which states that ‘without nuclear power, the UK would depend on fewer technologies which could expose us to greater risks to the security of our energy supplies’ and that ‘the Government believes nuclear power should be able to play a part in the UK’s future low-carbon economy’. There is a risk that, under the current SQSS, new nuclear plant would be rendered less economic, resulting in a lesser role for nuclear in the future energy mix, greater dependence on gas-fired generation, lower security of supply and higher carbon emissions.

8. Potential impact of the request on other Core Industry Documents^{iv}

None identified.

9. Potential impact of request on relevant computer systems^v

None identified.

Guidance notes

- (i) Please include address, contact telephone/fax number and optionally, a contact email address.
- (ii) Impact on the GB SQSS - Where possible, give an indication of those parts of the GB SQSS which, in the opinion of the Proposer, would be likely to require amendment in order to give effect to (or would otherwise be affected by) the request and an indication of the nature and contents of those amendments or effects (including, where relevant, any need for the establishment of new, or removal of existing GB SQSS criteria and methodologies).
- (iii) Justification - Please give reasons why you believe that the request would better facilitate achievement of the GB SQSS objectives as compared with the then current version of the GB SQSS, together with background information in support thereof. If more space is needed you can use additional sheets of paper which should be attached to this form.
- (iv) Core Industry Documents include but not limited to The Grid Code, System Operator – Transmission Owner Code and the Connection and Use of System Code
- (v) Where possible, please give an indication of the potential impact of the request on relevant computer systems and processes used by the Transmission Licensees.
- (vi) Incomplete forms will not be processed. The Proposer may be asked to clarify any information that is not clear; the Proposer's attention is drawn to clause **<Error! Reference source not found.** of the GB SQSS governance document.