



*Promoting choice and value for  
all gas and electricity customers*

Transmission licensees, potential offshore transmission licensees, generators, suppliers, consumer groups and any other party who has an interest in electricity transmission arrangements

Date: 25 January 2011

Dear Colleague

## **National Electricity Transmission System Security and Quality of Supply Standard (NETS SQSS): Review of Infeed Losses (GSR007 as revised by GSR007-1)**

### **Summary**

This letter sets out the Authority's decision regarding the proposal GSR007 and its revision GSR007-1 to modify the National Electricity Transmission System Security and Quality of Supply Standard (NETS SQSS). Submitted by the SQSS Review Group ('Review Group') on 11th September 2009, GSR007 proposes to increase the infeed loss risk limits. These limits are applied in the planning of the electricity transmission system as the maximum amounts of generation that can be disconnected from the transmission system by certain events defined in the NETS SQSS. They also have implications on the operation of the transmission system by affecting the amount of instantaneous loss of generation against which the system frequency must be maintained.

On 10th December 2010, after a further consultation with the industry, the Review Group submitted a revised proposal GSR007-1. This proposal recommends a change in the implementation date, of increases to the infeed loss risk limits, to 1st April 2014. It also proposes to include similar changes in sections of the SQSS relevant to offshore transmission.

The Authority's decision is to accept the above proposed changes in GSR007 as modified by GSR007-1. In coming to this decision the Authority has given particular consideration to the impact of the proposals on competition, consumers, security of supply and on sustainable development.

In order to implement this change the Authority is issuing, along with this decision note, a licence modification notice ("section 11A notice") for making changes to National Grid Electricity Transmission plc's (NGET) licence condition C17 and the two Scottish Transmission Owners' licence condition D3 along with the licence for future offshore transmission licensees condition E16. The changes would be to replace the reference of "version 2" of the NETS SQSS with "version 2.1".

### **Background to the Modification Proposals**

The NETS SQSS sets out the criteria that transmission licensees must apply when planning and operating the electricity transmission system. An important element of the SQSS is the need to control the risk posed to the system by certain specified events. The infeed loss risk limit is the maximum permitted net amount of generation which can be

disconnected from the transmission system by a specified outage condition and can be measured as:

- The output of a generating unit or a group of generating units or the import from the external systems disconnected from the system by a secured event, less
- The demand disconnected from the system by the same secured event.

There are two defined infeed loss risks applicable to different types of outage conditions<sup>1</sup>:

- Normal: currently set at 1000MW and applied to the outage of generation circuits or busbar sections, this effectively limits the size of a single generating unit to connect to the NETS to below 1000MW.
- Infrequent: currently set at 1320W and applied to defined combination of outages of transmission or generation circuits, busbar sections or switchgear, this effectively sets the minimum transmission equipment required to connect amount of generation exceeding 1320MW.

There are costs imposed on the transmission system by the size of the infeed loss risk limits, as a certain amount of frequency response will need to be held (ie generation which can be held in readiness) to ensure frequency remains within the acceptable range.

The GSR007 proposal to increase the infeed loss risk limits was first raised by EDF Energy (EDF) in February 2008. It suggested that the current infeed loss risk limits were no longer consistent with the range of generation technologies available to developers. Specifically, it suggested that the current limits could act as a barrier to the timely connection of large generating units being considered – including new nuclear units with capacities of up to 1800MW.

The Review Group, supported by a Working Group, took forward a review of the EDF proposal and in February 2009 consulted on their initial findings. They concluded in the final Amendment Report in September 2009 that both the infrequent and normal infeed loss risk limits should be increased, from the date when the first larger single generation unit connects to the NETS. The report was supported by the three existing transmission licensees and was submitted to the Authority for a decision along with associated licence change requests<sup>2</sup>.

In September 2010, the Review Group issued an open letter consultation to the industry, which proposed a revision to the GSR007 proposal by changing the implementation date to 1st April 2014 (referred to as GSR007-1). This proposal aimed to address concerns that the original proposal, in linking the implementation date to the connection of the first larger single generation unit, could act as a barrier to entry for clusters of smaller units with combined capacities up to 1800MW. This consultation received 6 responses: 5 were fully supportive and 1 was supportive in part. The Review Group sent an amendment report to the Authority on 10th December 2010, proposing to modify the original GSR007 proposal by replacing the implementation date with 1st April 2014 and to include similar changes in sections relevant to offshore transmission. This was followed by requests from the three transmission licensees to make associated modifications to their licences such that the revised version of the NETS SQSS would come into effect.

### **The Changes to NETS SQSS proposed by the Review Group**

The GSR007 Amendment Report recommends that the following changes be made to the NETS SQSS:

---

<sup>1</sup> Full definitions can be found in the NETS SQSS  
<http://www.nationalgrid.com/uk/Electricity/Codes/qbsqsscode/DocLibrary/>

<sup>2</sup> SLC C17, D3 and E16 refer to a specific version of the NETS SQSS – currently version 2.0. Therefore any change in the NETS SQSS requires a minor change in licence conditions to update the references.

- Paragraph 2.6.3 of the SQSS would be modified to increase the amount of generation allowed to connect to a single generation circuit, a busbar section or a mesh corner.
- The SQSS will define an 'infeed change date'. The 'Infeed Change Date' shall be the date on which a single generating unit, CCGT Module, boiler or nuclear reactor of Registered Capacity greater than 1320MW connects to the national electricity transmission system and commissions.
- From the 'infeed change date' the:
  - 'Normal Infeed Loss Risk' shall be increased from its current level of 1000MW to 1320MW; and
  - 'Infrequent Infeed Loss Risk' shall be increased from its current level of 1320MW to 1800MW.

The GSR007-1 Amendment Report recommends the following amendment to GSR007 original proposals:

- Remove the need for the introduction of the term "Infeed Change Date", and change the definitions of "Normal Infeed Loss" and "Infrequent Infeed Loss" so that the proposed increases take effect on 1st April 2014 instead of the "Infeed Change Date"; and
- Make proposals to modify clauses 7.2 and 7.2.1, and the definition of "Largest Infeed Loss", to allow the connection of offshore wind farms with a capacity up to 1800MW via a single cable from 1st April 2014.

### **Ofgem's Impact Assessment and Consultation**

Following the submission of the GSR007 Amendment Report, we issued on 29 October 2010 an impact assessment ('Impact Assessment') on the proposals<sup>3</sup> for consultation. The Impact Assessment set out a range of potential costs and benefits of the proposals and where possible quantified these benefits. In view of the then ongoing work by the Review Group on the change date, Ofgem also sought views on this issue.

Interested parties were invited to provide feedback on the Impact Assessment by 26th November 2010. We received 11 responses which have been published on our website<sup>4</sup>. A summary of the responses and our views on the points raised is attached as Appendix 1. The responses were generally supportive of the GSR007 proposal and the amendments set out in GSR007-1.

The Authority has decided not to conduct a further impact assessment in respect of the GSR007-1 proposal, taking into account, amongst other things:

- that the Review Group has itself consulted on the amendments and received (generally supportive) responses from the relevant stakeholders, which it has provided to the Authority;
- that certain of the responses to the GSR007 Impact Assessment included arguments for a fixed start date in preference to the change date mechanism;
- that certain of the relevant stakeholders have requested that the Authority consider the two proposals together;
- that the amendments made by GSR007-1 are relatively minor in the context of the proposals as a whole; and
- that it is, in the Authority's assessment, very unlikely that further consultation would assist in informing its decision on the amended proposals.

<sup>3</sup> <http://www.ofgem.gov.uk/Networks/Trans/ElecTransPolicy/SQSS/Documents1/GSR007%20IA%20Final.pdf>

<sup>4</sup> <http://www.ofgem.gov.uk/Pages/MoreInformation.aspx?docid=1&refer=Networks/Trans/ElecTransPolicy/SQSS>

In light of the above, the Authority considers that it is neither necessary nor desirable to conduct a further impact assessment. It would in large part duplicate work already done. The Authority is satisfied that interested parties have had an adequate opportunity to comment on the proposal, and that it is informed fully of the evidence, argument and views of those interested parties in reaching its decision.

## **The Authority's Decision**

The Authority has considered the issues raised by the modification, taking into account the views and arguments put forward in response to our Impact Assessment on GSR007 and further analysis contained in, and responses to, the Review Group's consultation on GSR007-1. The Authority has decided to approve the changes proposed by GSR007 as revised by GSR007-1.

## **Reasons for the Authority's Decision**

In this section we provide an overview of the key issues that have informed the Authority's decision on GSR007 as revised by GSR007-1 and summarise the Authority's assessment of the proposals in the following areas:

- Effect on sustainable development
- Effect on consumers
- Effect on competition

We also set out our assessment against both the Review Group's principles and the Authority's statutory objectives and duties.

### *Effect on sustainable development*

The key benefit for GSR007 identified by the Review Group (and upon which their cost benefit analysis relies) is the carbon savings associated with the connection of large nuclear generators. However, larger units do not necessarily mean additional carbon savings. Overall Ofgem's Impact Assessment has concluded that there would be an overall carbon benefit of £17m and £332m per annum as a result of the proposal. In addition to carbon saving, we also consider that there could be potential improvement of security of supply due to the removal of barrier to entry for some new nuclear plant.

With the implementation date being changed to a fixed date of 14th April 2014, GSR007-1 will allow new generation (some of which with low carbon emission) to connect to the system earlier. We have not quantified the additional carbon savings, but would expect this to be positive. The Review Group have concluded that additional carbon savings would be in the range £41m to £244m a year by 2016.

A number of respondents commented that there are a range of possible outcomes for carbon savings and a few suggested alternative methodologies. We acknowledge that there are a range of outcomes. However, based on the evidence presented by the review group and our own further analysis we believe that on balance the benefits exceed the cost.

### *Effect on consumers*

In considering the impact on consumers we have identified both positive and negative potential impacts that might arise as a result of GSR007.

- **Carbon savings.** The largest impact on consumers is likely to come from the benefits of the carbon savings discussed above.
- **Volume connecting behind single connection equipment.** Given that the NETS SQSS planning criteria already allow power infeed loss up to the infrequent infeed loss risk for some outage conditions, extending this would not require extra response to be held from the date of the electricity transmission licence change (or at least the

first time any such connection happens). We note that this potentially would increase the overall risk to the loss of power infeed, for example, through overlapping outages, but consider that the increase would be small.

- **The infeed loss risk limits.** There will be additional operating costs associated with any increase in the infeed loss risk limits. The Review Group considered this issue in some detail estimating additional costs of £160m.
- **Infeed change date.** The increase of the infeed loss risk limits are designed to be triggered by the connection of a large generating unit to the transmission system (with a capacity of greater than 1320MW). We note the intention of the transmission licensees to minimise any negative impact on consumers by ensuring that costs are not incurred unnecessarily. However, we also note that linking the change date to the connection of the first larger unit does not eliminate the possibility of net negative impact on consumers.
- **Wholesale price impact.** Enabling the connection of larger generators could have an impact on the overall generation mix as these arrangements may favour particular generation types, most notably nuclear. Whilst GSR007 alone is unlikely to determine the investment decisions of those parties interested in building new generation, it is thought that this proposal would increase the likelihood of additional nuclear generation coming online. This would potentially result in a downward impact on wholesale prices due to marginal costs.

Broadly we would expect the impact of GSR007-1 on consumers to be similar as discussed above for GSR007. However, the revised implementation date of 1st April 2014 would bring about impacts in two key areas:

- Clusters of low-carbon generation units of smaller individual sizes could be connected to system earlier with lower transmission investment, resulting in carbon and transmission cost savings for consumers from this date
- The costs associated with increased frequency reserve will be incurred sooner.

The Review group have concluded that up to four projects that already have signed connection agreements could benefit from the earlier implementation date. A further two potential projects could also benefit if they go ahead. Additional costs of frequency reserve were estimated to be £120m pa.

We note concerns expressed by some respondents that the costs incurred by changes proposed under GSR007 are not targeted to parties whose connection would benefit from such changes. However, we also note other parties supported the continued socialisation of response costs. NGET has decided not to bring forward any proposal to change the way frequency response and reserve costs are charged. In the meantime, Ofgem has launched Project TransmiT which is a holistic review of the GB transmission charging and connection arrangements. Whilst we consider sufficient case has been made for the changes proposed by GSR007 and GSR007-1, we note that Project TransmiT may include further discussion of the charging arrangement of various cost elements in transmission.

#### *Effect on competition*

In considering the impact on competition we have identified both positive and negative potential impacts that might arise as a result of the GSR007:

- The proposals are likely to remove a barrier to the timely entry of larger generating units onto the transmission system. This should facilitate competition to the ultimate benefit of consumers.
- As a result of the increase in the infeed loss risks being linked to the connection of a large unit (greater than 1320MW), there is a real potential for discrimination against smaller units connecting to existing spurs to arise under that proposal.

GSR007-1, by fixing the change date at 1st April 2014, will allow smaller units to connect to an existing spur, and therefore will resolve the issue of potential discrimination against

generation units of smaller sizes. As discussed above the Review Group assess that this may benefit up to six projects.

## **Overall assessment of the proposals against the relevant principles of the Review Group**

In this section we summarise our assessment of the proposals under GSR007 as revised by GSR007-1 against the principles of the Review Group.

### *1. Development, maintenance and operation of an efficient, economical and coordinated system of electricity transmission*

It is our assessment that the proposals of GSR007 as revised by GSR007-1 will aid in the development of an efficient, economical and coordinated system:

- It is beneficial for the development of the transmission network not to be unnecessarily limited in terms of the size and types of generators connecting to the system. Implementing the higher infeed loss risk limits set out in GSR007 on 1st April 2014 will assist in ensuring the efficient development of the system by ensuring that the need for unnecessary reinforcement of transmission spurs is removed when smaller units wish to connect to an existing spur.
- It aims at ensuring efficiency by changing the restrictions on connection allowing generators to make efficient investment decisions.

### *2. Ensure an appropriate level of security and quality of supply and safe operation of the NETS<sup>5</sup> Transmission System*

We note the assessment by the transmission licensees that the GSR007 proposals would not adversely affect the level of security and quality of supply and safe operation of the transmission network.

We note that NGET in its role as SO is undertaking some further work regarding the most efficient way of providing frequency response arrangements. We understand that the issue has been referred to the joint Balancing Services Standing Group /Grid Code Review Panel Frequency Response working group for urgent consideration. We also understand that notwithstanding the need for urgency the Review Group did not believe it to be a barrier to the proposed change to the SQSS.

### *3. Facilitating effective competition in the generation and supply of electricity*

It is our assessment that on balance the proposals would facilitate the effective competition in the generation and supply of electricity. This is because:

- The proposals would remove a barrier to entry of large generating units to the transmission system
- The revised proposal removes concerns of differential treatment for smaller generators

---

<sup>5</sup> The SQSS governance (available on National Grid website) refers to the GB Transmission System but the SQSS has since been updated to reflect the offshore transmission system. The NETS is made up of the onshore transmission system (previously referred to as the GB Transmission system) and the offshore transmission system.

## **Assessment against the Authority's statutory objectives and duties**

For the reasons outlined in the previous sections the Authority considers that the proposals set out in GSR007 and GSR007-1 would better facilitate the Authority's principal objective and statutory duties.

Ofgem's principal objective is to protect the interests of existing and future consumers, wherever appropriate by promoting effective competition. In protecting the interests of consumers we must have regard to protecting the security of energy supplies, including the need to secure that all reasonable demands for gas and electricity are met and also the need to contribute to the achievement of sustainable development.

The Authority is generally required to carry out its functions in the manner it considers is best calculated to further the principal objective, wherever appropriate by promoting effective competition between persons engaged in, or commercial activities connected with,

- the shipping, transportation or supply of gas conveyed through pipes;
- the generation, transmission, distribution or supply of electricity;
- the provision or use of electricity interconnectors.

### **Subject to the above, the Authority is required to carry out the functions referred to in the manner which it considers is best calculated to:**

promote efficiency and economy on the part of those licensed<sup>6</sup> under the relevant Act and the efficient use of gas conveyed through pipes and electricity conveyed by distribution systems or transmission systems; protect the public from dangers arising from the conveyance of gas through pipes or the use of gas conveyed through pipes and from the generation, transmission, distribution or supply of electricity; and secure a diverse and viable long-term energy supply, and shall, in carrying out those functions, have regard to the effect on the environment.

The Authority's views in respect of competition, sustainable development, consumers and security of supply have already been covered by the Review Group principles.

### **Implementation and future work**

This letter sets out the Authority's decision to approve the proposed changes to the NETS SQSS. In order for these changes to take effect the transmission licences would need to be modified such that they refer to the new version of the NETS SQSS. Therefore the next step is a Statutory licence change consultation. Notice of the intended amendments to the transmission licence will also go out to preferred bidders for offshore transmission licences, as these bidders are persons likely to be affected by the making of the modifications.

Any queries regarding the content of this letter should be made to Sheona Mackenzie ([Sheona.mackenzie@ofgem.gov.uk](mailto:Sheona.mackenzie@ofgem.gov.uk) , telephone - 0141 331 6019) in the first instance.

Yours faithfully

Hannah Nixon  
Partner, Transmission

---

<sup>6</sup> Or persons authorised by exemptions to carry on any activity.

## **Appendix 1 – Summary of Responses to Impact Assessment**

We received 11 responses and all respondents were in general, in support of implementing the proposals.

### **Chapter 1, Question 1: Are there other relevant criteria which respondents feel should form part of our assessment?**

In general, most respondents considered that we have included all of the relevant criteria in our assessment.

One respondent raised the issue of considering network circuit failure in addition to generation unit failure as this would significantly reduce the system risk posed by groups of smaller generators and would reflect current generation market developments.

One respondent noted that the analysis shows that carbon savings more than offset the additional cost of frequency response. They considered a more appropriate analysis should be made with the extra cost of building smaller nuclear power stations rather than larger ones.

One respondent noted that the criteria for triggering the change to infeed loss limits was potentially discriminatory to different types of nuclear generating unit design, but noted that these concerns were allayed if a fixed implementation date of 1st April 2014 was used.

### **Chapter 3, Question 1: Do respondents consider that we have appropriately identified the impacts of the GSR007 proposals? Do respondents consider that there are any additional impacts that we have not fully considered?**

Most respondents agreed that we had appropriately identified the major impacts of the proposals. However, two respondents suggested the need for additional analysis.

As noted above one respondent considered that the analysis should take into account the additional cost of building smaller nuclear plant and they presented some analysis on this. They also considered that the analysis should include the impact of charging mechanisms.

One respondent, whilst agreeing that the major impacts had been appropriately covered, considered that the impact of Electricity Market Reform on wholesale prices and the volume of response and reserve held had not been taken into account.

### **Chapter 3, Question 2: We have presented a range of approaches in measuring these impacts. Do respondents believe that this range is appropriate? Which measures presented (or other approaches) do respondents consider should be used in our final assessment/decision?**

One respondent commented that the assumptions on the additional costs of frequency response are very broad and only represent one possible outcome. They believe that the consequence of this may be that the break even analysis is overly conservative and that fewer large generating units may need to be built to gain a net cost benefit.

One respondent recognises that scenario analysis of this kind is not definitive and recommends taking a view across a range of parameters in order to reflect the range of potential outcomes. They suggest assumptions on carbon intensity are not consistent with DECC's published guidelines on carbon appraisal and that displacement of 45% of low-carbon generation may or may not be accurate, and for these reasons are less supportive of scenarios 2 and 4.

One respondent recommended that Ofgem do not proceed with scenarios 1 and 2, and only apply scenarios 3 and 4. They recognise that any benefit analysis of a limit change should



be focused on the additional benefit, rather than the absolute benefits, that are encouraged through the connection of larger generation units. They suggest that scenarios 1 and 2 do not convey the benefit of increasing the infeed limit in that they reference a zero build counterfactual case. They believe this implies that if traditional scale generation is not connected in the future it is the impact of the regulatory framework and not market forces and competition.

One respondent states that while scenario 3 and 4 appear suitable comparators on paper, they are unlikely to be the result of a commercial outcome. This is because scenarios 3 and 4 suggest the development of larger units in place of smaller units. In reality, the units are based on different technologies and are not commercially interchangeable. They are concerned that this approach risks being overly prudent.

**Chapter 3, Question 3: Do respondents wish to present any additional analysis that they consider would be relevant to our assessment of the GSR007 proposals?**

Four respondents did not present any further analysis, and three respondents conducted additional analysis as follows:

- One respondent presented an analysis of reserve costs that, based on a probabilistic analysis of generator trips, suggested that reserve costs could be lower than in the Impact Assessment.
- One respondent presented additional analysis to support the adoption of larger offshore cables. This analysis was not presented at the time of the open letter because it was not possible to quantify the cable cost savings, however the analysis further supports the benefit case for GSR007.
- One respondent argued that the cost benefit case should compare the increase in reserve costs with the additional cost of building smaller nuclear plant

In addition to the above analysis, the Review Group in its report to the Authority presented an additional analysis of GSR007-1. In this analysis the Review Group presented an assessment of the costs and benefits of fixing the implementation date of GSR007 to 1st April 2014. The conclusions were that for the period 2014 to 2016 costs amount to £120m vs. benefits ranging between £51m and £254m. The Review Group also conducted analysis of the potential additional benefits for offshore generation. The analysis suggests that the additional benefit could be £29m by 2016.

**Chapter 4, Question 1: Do respondents have any views on either the process or timetable that are proposed for the Authority making its decision on the proposed licence changes?**

In general respondents accepted that a four week consultation period was appropriate given that these issues have already been subject to an industry consultation process and are well understood. They recognised that a prompt decision would provide certainty and benefit the industry and welcomed a decision by the end of the year.

Most respondents either suggested that the proposals set out in the open letter to the industry from the Review Group that the infeed loss risk limit be increased from 1st April 2014 be considered by Ofgem or decided on promptly. Most respondents agreed that this revised proposal will allow for additional non-nuclear generation to connect earlier and thus remove the barrier to entry for non-nuclear generation.