

## DRAFT Minutes

<b>Meeting Name</b>	NETS SQSS Sub-Synchronous Oscillations (SSO) Working-Group
<b>Meeting Number</b>	2
<b>Date of Meeting</b>	3 October 2014
<b>Time</b>	10:00 – 14:00
<b>Location</b>	B1.4, National Grid House, Warwick and Teleconference

## Attendees

Name	Role	Initials	Representing
Graham Stein	Chair	GS	-
Bieshoy Awad	Member	BA	National Grid SO
Andrew Dixon	Member	AD	National Grid SO
Cornel Brozio	Member	CB	SPT
David Adam	Member	DA	SPT
Yash Audichya	Member	YA	SSE
Alastair Frew	Member	AF	Scottish Power
Phillip Jenner	Member	PJ	RWE
Ankit Patel	Member	AP	SSE
John Reilly	Member	JR	EdF
Mayure Daby	Authority	MD	Ofgem

## Invitees

Name	Role	Initials	Representing
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## Apologies

Name	Role	Initials	Representing
Danson Joseph	Member	DJ	National Grid TO
Nick Martin	Secretary	NM	-

## 1 Introductions & Apologies

GS opened the meeting by thanking all of those in attendance. Special consideration was given to those that had travelled from afar. The apologies were also noted.

## 2 Approval of Minutes

The draft minutes from the previous meeting were approved without the need for any changes.

## 3 Review of Actions

a) Actions From Previous Meeting:

Action	Description	Action Owner	Due Date
1.0	Determine the reference number of "other" Grid Code issues that concern SSO phenomena and share this information with the working-group as required.	GS	ASAP
1.1	Provide a written definition / explanation of SSO phenomena and share this with the working-group.	AD / BA	Sept 2014
1.2	Produce a paper and / or presentation that identifies several versions of proposed NETS SQSS wording to incorporate SSO phenomena into the standards; determines where best to position these within the standards and determines whether or not these proposals would drive any new investment by the TO.	AD / BA	Sept 2014
1.3	Circulate a doodle poll to determine the most appropriate date for the next working-group meeting.	NM	ASAP

GS provided an update with respect to Action 1.0. There are currently no issues registered with the Grid Code Review Panel (GCRP) concerning SSO phenomena and hence there are no issue reference numbers to be quoted.

The working-group discussed that raising an issue at the GCRP could help raise the interest of other GCRP members in this working-group and could eventually lead to a higher level of engagement. MD pointed out that it might be an opportunity to gain some OFTO representation also, since there is currently no OFTO representation on this working-group.

***ACTION: NGET to raise the issue concerning roles and responsibilities in the management of SSO phenomena at the next GCRP meeting.***

An update with respect to Actions 1.1 and 1.2 will be provided under Agenda Item 5 within these minutes. Action 1.3 is complete.

## 4 Updated Working-Group Terms of Reference (WG ToR)

GS provided an update with respect to the GCRP discussions concerning GC0077 which is in relation to Transmission Licensees obligations concerning SSO. GS advised that the GCRP has recommended that the NETS SQSS GSR018 working-group should provide recommendations on any modifications required to the Grid Code as well as to the NETS SQSS.

The working-group discussed that if we were to establish a separate Grid Code working-group the membership will be predominantly the same as that of this NETS SQSS working-group. Hence it would appear to be more efficient to have one working-group to propose the necessary changes for all relevant codes.

***ACTION: NGET to update the WG ToR for this working-group to include the provision of recommendations on any modifications required to the Grid Code.***

## 5 Discussion Items

BA gave a presentation to the working-group. He started by providing a brief review of the background to the working-group.

BA proceeded to explain the role of the NETS SQSS and how it is applied by the Transmission Licensees when designing and operating the transmission network. It was noted that despite the fact generators would not typically apply the NETS SQSS, the standards still have a significant effect on them as it determines the scope of works required to connect them and the terms and conditions of their agreements (e.g. restrictions on availability and intertrips...etc...)

The commercial process involving the application of the NETS SQSS was then described. It was noted that in some instances, application of the NETS SQSS could trigger works that affect a Third Party Transmission System User. In this case, the Affected User will be informed by the potential works via a Modification Notification and will be requested to submit a Modification Application, free of charge, in accordance with the Connection and Use of System Code (CUSC) to allow NGET to amend their bilateral agreement.

PJ requested clarification on whether there will be any securities or liabilities required from the Affected User. BA mentioned that if the Affected User is already connected there should be no need to require them to provide securities for the works. However, this would be better confirmed by NGET's commercial and charging teams.

***ACTION: NGET to confirm that when a transmission project affects a specific Transmission System User (Affected User) there are no securities / liabilities required from that Affected User.***

Definitions for SSO and Unacceptable SSO were then presented to the working-group members, who were invited to comment upon them. The definitions were made general on purpose in an attempt to cover off all potential issues. YA suggested using terms already defined in published literature. BA confirmed that the literature had been checked but that in his view there would seem to be a need for a more generic definition to cover off all potential SSO phenomena. However, all additional input was welcomed. CB added that we need to be careful when thinking about the definition so that we provide the right balance of detail. BA supported this point of view and commented on the difficulty of finding the right balance between being generic enough whilst still providing the degree of comfort required by generators.

***ACTION: SHE Transmission to provide the literature they recommend to use as a basis for defining SSO.***

YA challenged the requirement to provide positive damping on the basis that no damping controller would be able to provide positive damping over the entire sub-synchronous frequency range. BA clarified that the definition is more concerned about the overall performance of the power system rather than that of a single controller.

***ACTION: All working-group members to consider what (if any) suggestions they might have for improving the definition(s) at this stage.***

A concern was raised that in the early stages of a connection application there may be no generator shaft data available and that once this data is provided, the scope of any transmission reinforcement works required might need to change. This may affect the terms of the bilateral agreement which would cause an issue. AF, AP, and JR all agreed that providing the necessary data would be a challenge for all old generation plants, especially those that were built by a company that is not based in the UK and has no real interest in the UK market.

It was noted that some of the feedback from the industry consultation on the GCRP modification proposal suggested that generators need to be consulted while the SSO requirements are assessed in order to ensure that their generating units are not subjected to any inappropriate risks.

A generic NETS SQSS clause was then discussed and it was noted that the working-group will have to come up with criteria for Unacceptable SSO that would need to be met for a set of background conditions and secured events. A list of options was presented and a methodology to specify the preferred option was presented.

BA mentioned that the easiest solution, but not necessarily the right solution, is to assume the criteria for System Instability (following a disturbance, 85% of change should happen within 20 seconds (i.e. the slowest time constant is 12 seconds)); and that this is required to be met for all background conditions that are currently defined within the NETS SQSS. In this case, no change to the NETS SQSS would be required.

BA categorised the options identified for background conditions and secured events into:

- apply the same background conditions and secured events that we currently secure the system against;
- apply stricter background conditions (e.g. specific assumptions on generator active or reactive power loading, specific assumptions on what other generators are doing...etc...) and more onerous outage conditions (e.g. N-3);
- apply less onerous background conditions and secure the system against fewer events.

It was discussed that as the background conditions currently outlined provide a sound basis for economic and efficient design, any change, addition or deletion from these current conditions would need to be well justified.

BA then suggested that the concerns and priorities that need to be discussed were:

- concerns over generator risks (i.e. the cost and implications of an SSO incident affecting a generator);
- concerns over additional investment costs;
- concerns about operational costs (e.g. what are the actions required to secure the system against Unacceptable SSO conditions and what are the costs associated with these actions.)

CB pointed out that again a balance is required. There is no point of designing the network to cope with SSO under depleted system conditions if the thermal limitations would dictate constraining generators anyway. BA agreed and pointed out that the NETS SQSS assumes that the network will be designed only for defined scenarios.

YA suggested that the background conditions and secured events should allow the TO some flexibility when designing the network (e.g. securing for a more onerous condition if the economics dictate). GS explained that the NETS SQSS provides a baseline for design. BA clarified that where economics suggest that the TO should secure for more onerous conditions than the conditions identified in the NETS SQSS, there is a mechanism by which the regulator would allow extra funding (subject to the right economic justification). The same applies when the TO identifies that a certain reinforcement that is required under NETS SQSS conditions is not considered economic. In the latter case, the TO is required to apply for a derogation from the regulator.

BA moved on to discuss the options for Unacceptable SSO criteria. The simplest option identified was to assume that the current definition for System Instability is adequate or if the 12 second time constant is considered unacceptably long, then this value be decreased. CB mentioned that it would be better to have separate definitions and criteria for SSO and System Instability on the basis that both are separate phenomena and it would be challenging to encompass them both under the one umbrella.

AF emphasised that we shouldn't be too restrictive in specifying the criteria for Unacceptable SSO. The system inherently includes SSO even without series compensation. Monitoring equipment can detect these oscillations on the electrical system today but the magnitude is fairly negligible hence there is no issue of having them provided that they don't increase to become a potential risk to the generators.

BA then mentioned that the options in this case would range from having a high level definition, similar to the definition presented after incorporating feedback from all parties, to more comprehensive criteria specifying limits on magnitudes and / or time constants for different modes. However, this would need input from generators to specify what their concerns are.

## **6 Any Other Business**

None

## 7 Next Meeting

The next meeting is scheduled for late November / early December 2014. This is scheduled to be at the SSE Offices in Glasgow and via teleconference. Further details shall be circulated nearer the time.

***ACTION: NGET to circulate a doodle poll to determine the most appropriate date for the next working-group meeting.***

## 8 Summary of Actions

a) On-Going Actions:

All actions from previous meetings have been previously discussed and / or closed.

b) New Actions:

Action	Description	Action Owner	Due Date
2.0	NGET to raise the issue concerning roles and responsibilities in the management of SSO phenomena at the next GCRP meeting.	GS	ASAP
2.1	NGET to update the WG ToR for this working-group to include the provision of recommendations on any modifications required to the Grid Code.	NM	ASAP
2.2	NGET to confirm that when a transmission project affects a specific Transmission System User (Affected User) there are no securities / liabilities required from that Affected User.	BA	December 2014
2.3	SHE Transmission to provide the literature they recommend to use as a basis for defining SSO.	YA	ASAP
2.4	All working-group members to consider what (if any) suggestions they might have for improving the definition(s) at this stage.	ALL	December 2014
2.5	NGET to circulate a doodle poll to determine the most appropriate date for the next working-group meeting.	NM	ASAP