

# Summary of Meeting and Actions

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Meeting Name	Rated MW Working Group
Meeting No.	4
Date of Meeting	Thursday, 6 <sup>th</sup> March 2008
Time	10:00am – 2:00pm
Venue	C3-1, National Grid House, Warwick

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This note outlines the key action points from the fourth meeting of the Rated MW Working Group.

## 1) Minutes from Previous Meeting

The draft minutes of the Grid Code Rated MW Working Group meeting held on 29<sup>th</sup> January 2008 were APPROVED, subject to minor amendments and will be accessible from the Grid Code Website.

## 2) Working Group's Scope

The Working Group noted that the Grid Code was currently silent on the Mvar provision of a Generating Unit, if that unit was operating above or below Rated MW. National Grid had expressed concerns regarding the potential implications on the GB Transmission System (planning and operational timescales) of Generating Units exceeding their Rated MW e.g. planning assumptions incorrect, management of the GB Transmission System more complex within operational timescales.

National Grid believes that going forward the current wording in the Grid Code is not sufficiently robust given the uncertainty and complexity which it will introduce into the planning and operation of the GB Transmission System. The Working Group noted that they had been tasked with identifying a generic solution which could be codified within the Grid Code which addressed both National Grid and User's requirements regarding Generating Units exceeding their Rated MW

## 3) Potential Solutions

The Working Group noted that previous discussion had focused on the following possible solutions:

### Reactive Market

The Working Group was informed that a previous Grid Code Working Group had investigated this issue. The Grid Code Reactive Power Review Group noted that it may be possible to introduce a relaxation on the lagging range to 0.90 power factor. This recommendation was made on the proviso that the shortfall in Mvar would be made up via the establishment of a unified reactive market.

### Equivalent Reactive Power Provision Capped (Top Hat Approach)

The Working Group discussed further the potential solution of providing a reactive power capability equivalent to 0.85 lagging to 0.95 leading power factor at Rated MW at Active Power outputs up to 'x%' above Rated MW.

National Grid indicated, based on analysis undertaken, that it would be able to accommodate a 5% increase in output above Rated MW from a System Operator with only a small requirement for additional system re-inforcement. National Grid suggested that for output exceeding 5%, the Generating Unit would be required to provide a capability between 0.85 power factor lagging and 0.95 power factor leading at the higher level.

The Working Group had queried the different levels for the MVAR provisions. National Grid indicated that the erosion of MVAR capability due to generating units operating in excess of 5% above Rated MW could only be accommodated by significant extra

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investment/expenditure and that this additional investment/expenditure would have to be assessed against the benefit to all users.

## 4) Transient Solution

The Working Group discussed in detail the feasibility of introducing different continuous and short term reactive power capabilities. In practice this would mean allowing the despatch of Mvars within a reduced capability (0.90 power factor lagging which is comparable to MW output 6% above Rated MW) during normal operation of the GB Transmission System. During post fault circumstances the Generating Unit would have to be capable of providing 0.85 lagging at their pre-fault MW output level for a limited period.

National Grid would have a limited period of time to re-configure the network to alleviate the effects of the fault. After this period of time the Generating Unit would re-tap their transformer to return the unit's output to within its performance chart. It was noted that if National Grid had not rectified the problem within the specified time slot, it would take Bid Offer Acceptances to allow the reactive power output to be sustained, possibly from other Generating Units.

National Grid presented analysis which illustrated that it was rare for the System Operator to despatch a Generating Unit outside the 0.90 lagging envelop during normal operation of the GB Transmission System. Initial indications from National Grid Electricity Control Room were that 1.5 hours was an acceptable timeline to re-configure the network to alleviate the effects of the faults. Therefore National Grid was suggesting a post-fault 0.85 lagging threshold for 1.5 hours based on the requirements of operating the system during transient conditions.

National Grid informed the Working Group that the analysis was based on sample set of Large Power Stations operating in England and Wales. The sample data was taken from January 2000 to December 2007. It was acknowledged that given that the sample only focused on one part of the system and further analysis would have to be undertaken to understand the impact across the entire GB Transmission System. National Grid informed the Working Group that it would not have the same data sample available for Power Stations operating in Scotland given that the BETTA arrangements were only introduced in April 2005. National Grid will request data from SPT and SHETL such that similar analysis for a sample set of Power Stations in Scotland can be completed.

**Action: National Grid**

This solution would result in a change to the leading side provisions as it would follow the excitation limiter which would see a slight reduction in the amount of MVAr available. The Working Group was informed that impact of this option on the leading side had yet to be assessed. It was noted that there was the potential for a greater erosion of MVAr on pre-vesting plant, due to their configuration, which may not occur on new plant.

**Action: National Grid/Working Group Members**

The Working Group was informed that this solution would not result in any additional capital expenditure to be incurred by National Grid and would also simplify and add clarity to the Reactive Power provisions. However it was noted that operating outside its performance chart would place the Generating Unit under strain, the possible affects of which would have to be assessed as part of the feasibility analysis of the solution.

All Working Group members agreed to give further consideration to the solution from a technical (Generators) perspective, in particular the proposed transient requirement i.e. 0.85 lagging at their pre-fault MW output level for 1.5 hours. It was noted that the solution would potentially have more impact on existing plant rather than new plant (new solution could be requirement of the design).

**Action: Working Group Members**

The Working Group discussed what the performance chart would look like under the proposals. The Working Group noted that the performance chart would refer to the

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maximum MW level at which the Unit would have to capability of providing 0.90 lagging. There would be no step changes in the performance chart and this is consistent with the physical capabilities of a Generating Unit i.e. a continuous smooth curve.

The Working Group discussed whether under this solution the term 'Rated MW' would still be applicable given that the requirements for Reactive Power would be based across the entire operating range (under normal conditions) rather than just one point.

The Working Group acknowledged that there were a number of outstanding issues which required consideration by National Grid and the Working Group before proceeding with this solution:

- Compliance – what would be the process for ensuring compliance, especially for the transient element of the solution?
- Leading –the solution would result in a change to the leading side provisions as it would follow the excitation limiter which would see a slight reduction in the amount of MVARs available. Would this erosion in the MVAR provisions provided on the leading side have any material impact on the GB Transmission System, especially regarding the issue of stability?
- Declaration of MEL – Generators may re-declare their MEL with limited notice (within gate) which may under certain circumstance result in an exacerbation of the situation especially during fault conditions.

**Action: National Grid**

The Working Group discussed whether the solution would still require site specific requirements being stated in Bilateral Agreements. It was acknowledged that Grid Code provisions do not preclude the option of specify site specific obligations in Bilateral Agreements where appropriate. It was accepted that current Reactive Power requirements specified in the Bilateral Agreements would be honoured in the event of the current Grid Code requirements being amended.

The Working Group discussed the possibility of the Reactive Power requirement being based on a Power Station rather than an individual Generating Unit. It was acknowledged that the Grid Code provisions are predominately based on Generating Units rather than Power Stations given the complexity which arises from split sites etc. National Grid agreed to investigate the issue and report back to the Working Group.

**Action: National Grid**

Group members acknowledged that the transient solution may require a change in the Working Group terms of reference given that the Reactive Power requirements below Rated MW may also be affected. A briefing paper will be presented at May 2008 GCRP outlining discussions to date and requesting a change to the original terms of reference.

**Action: National Grid**

The Working Group also acknowledged that given the potential implication of the solutions on existing Generating Units, it may be beneficial to raise the issue at the Operational Forum. National Grid will investigate and report back to the Working Group.

**Action: National Grid**

### 5) Market Arrangements

The Working Group has acknowledged that there may be some benefit in developing the existing commercial/market mechanism for the mandatory provision of Reactive Power which would operate along side the formal technical requirements specified in the Grid Code.

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The Working Group acknowledged that the correct mix of technical requirements and commercial arrangements could provide the optimum solution for the mandatory provision of Reactive Power which is required for the security of the GB Transmission System.

As such the Working Group will be making a formal request the Balancing Services Standing Group (BSSG) to consider the following questions:

- If there was a reduction in the technical requirements for the mandatory provision of Reactive Power, from 0.85 to 0.90 on the lagging side, could the market support the procurement of the 'shortfall' of MVAr's via an appropriate 'commercial/market mechanism'?
- Could the market support the procurement of MVAr's for a 0.85 lagging transient (post fault) requirement? If yes, what would be the market arrangements?

A draft request (inclusive of questions) will be circulated to the Working Group for comment/review before being formally submitted to the BSSG (via Standing Group Chairperson).

**Action: National Grid**

There was general acceptance, from the Working Group, that the development of any market arrangements would take a substantial period of time and there was merit in continuing with the formal Grid Code review.

## 6) Next Steps

The following points will be discussed at the next Working Group meeting:

- Transient Solution – Feasibility, Cost Benefit Analysis
- Implications for National Grid (planning and managing the system)
- Implications on Generators (technical and commercial)

The Working Group Report will incorporate:

- Cost/benefit analysis for each potential solution identified
- Analysis Completed
- Identification of preferred solution which is assessed against the applicable objectives
- Implications on the GB Transmission System (inclusive of other relevant parties)
  - It was noted that the Scottish Transmission Owners had been kept informed of Working Group discussions and a request had been submitted for their input/evaluation on the potential solutions, highlighting any effects on their Transmission System.

## 7) Next Meeting

The next Working Group meeting is scheduled for 6<sup>th</sup> May 2008 at National Grid House, Warwick, commencing at 10am.

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## Appendix 1 – Working Group Attendance

### Members Present:

Lilian Macleod	LM	Working Group Chairperson
John Addy	JA	National Grid
Mark Perry	MP	National Grid
Claire Maxim	CM	E.ON UK
Bridget Morgan	BM	Ofgem
Andrew Morgan	AM	RWE
John Morris	JM	British Energy
John Norbury	JN	RWE

### Apologies:

Neil Carter	NC	National Grid
Stuart Easterbrook	SE	National Grid
David Scott	DS	EDF Energy