

Requirement for the Provision of Reactive Power Capability Data Prepared by National Grid

Provision of Initial Reactive Capability Data

1. Under the Planning and Operating Codes Generators are obliged to provide NGET with the Generator Performance Chart shown in OC2 Appendix 1 of the Grid Code. This requirement applies to existing and proposed generating units. The chart shows the reactive capability from 0 MW output up to Rated MW. Resubmission takes place annually as part of the Week 24 data.
2. In the current format the chart does not provide sufficient information to model the reactive capability of the generating unit for power system studies in operational timescales nor to determine the payments for delivering reactive power in accordance with the Mandatory Services Agreement. This requires the reactive output at the boundaries of the generating unit's operating envelope i.e. **Full Output** and **Minimum Output** as defined in BC2.A.3.1 of the Grid Code. Note that the **Full Output** of the machine need not necessarily be the same as **Rated MW**. The Generator provides the reactive output at Full Load and Minimum Load as numerical data during the process of drawing up the Mandatory Services Agreement.

Changes to Reactive Capability

3. There will be periods when temporary restriction on a generators reactive capability will prevent the delivery of the reactive output defined in the MSA. The Generator is obliged to inform NGET immediately of the temporary restriction by fax using the pro forma shown in BC2 Appendix 3. The notification process is shown in Appendix A of this paper.
4. This obligation applies whenever the capability of the generating unit changes from the level previously notified to NGET either by the MSA or the BC2 Appendix 3 pro forma. Changes in performance which result in a long term non-compliance with the Grid Code or derogated values will be covered by the lifetime compliance process.
5. The vast majority of facsimiles are sent directly by Power Stations to NGET. However because the data is not directly associated with the performance chart some Power Station have experienced difficulty in determining the appropriate values of reactive output particularly when the reactive capability of a generating unit return s to normal following a temporary shortfall.
6. Where there is permanent change to the reactive capability of a generating unit e.g. after an overhaul the Generator will submit a revised performance chart along with the BC2 Appendix 3 proforma to provide the reactive capability at Full and Minimum output.

Proposal to Unify Reactive Data Submission

7. This division of reactive data and the consequently need for two separate submissions could be avoided by enhancing the generator performance chart to include the reactive data at **Full Output** and **Minimum Output**, see figure 1. The reactive output at the three power levels would be shown explicitly on the chart. This would establish a link between the performance chart and the information provided on the proforma.
8. It is envisaged that a copy of the enhanced performance chart would be held at each Power Station to assist with the derivation of the reactive capability at **Full** and **Minimum Output** when the reactive capability returns to normal following a temporary shortfall.
9. If this change goes ahead the Generators would be required to submit revised performance charts for all gensets within a short timescale of the change being agreed. Alternatively the requirement to submit an enhanced performance chart could be limited to generating units connecting after a certain date.
10. The enhanced chart utilises more definitive points than the current chart, hence the number of revisions required over the lifetime of a generating unit is likely to be higher.

For example changes to the **Full** or **Minimum Output** would trigger a requirement to submit a revised performance chart. Generators need to consider the number of changes expected and whether this would outweigh any the benefits.

11. As it would be impractical to resubmit a revised performance chart for a temporary change to the reactive capability the current process using the proforma would be retained.

Recommendation

12. The Grid Code Review Panel is invited to
 - Acknowledge that the Generator Performance Chart does not provide sufficient information on reactive capability for operational and commercial purposes.
 - Consider whether the benefits of moving to an enhanced performance chart (allowing a single submission of reactive data) outweigh the costs of having to submit enhanced performance charts for all Gensets.

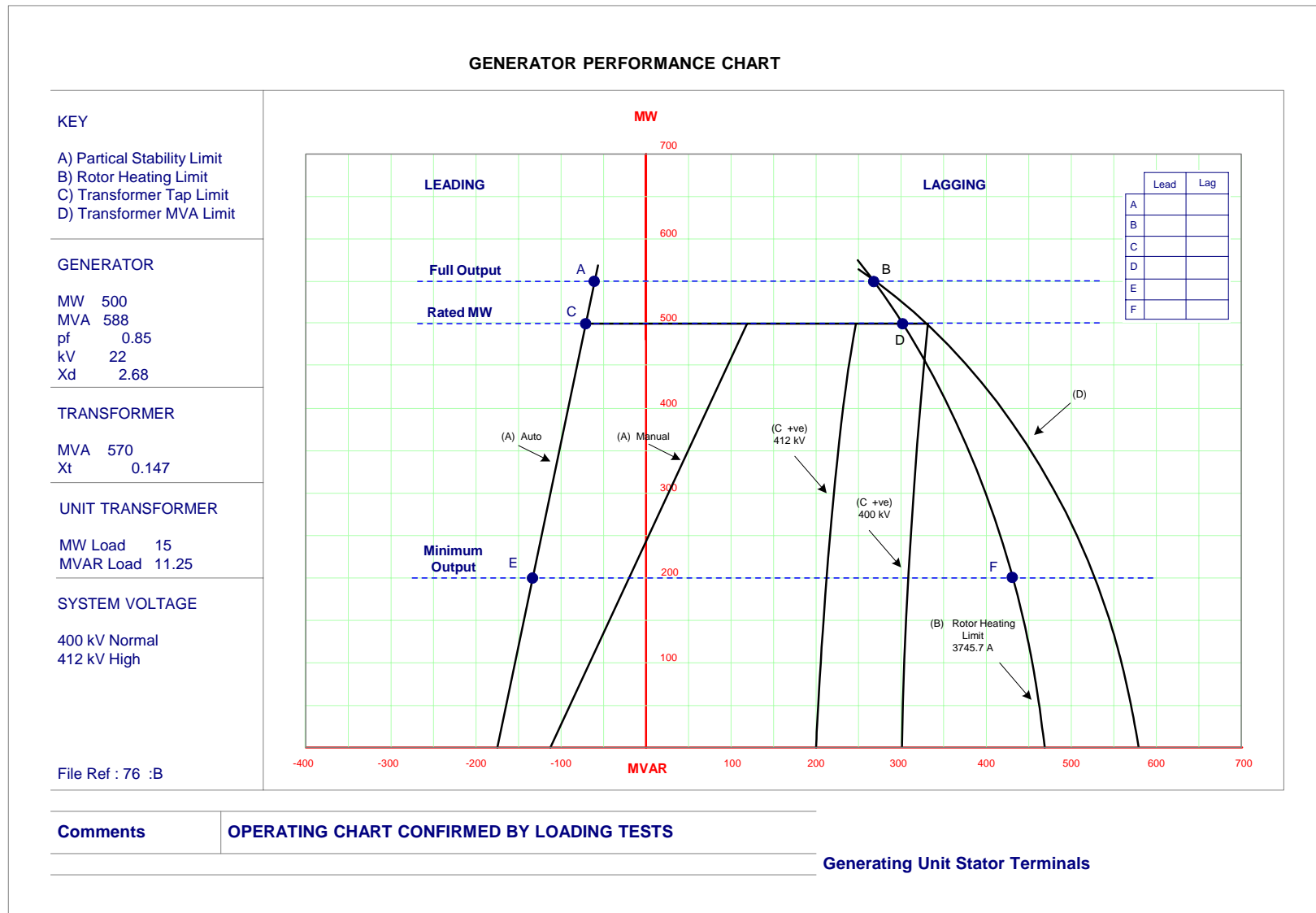


Figure 1 Enhanced Generation Performance Chart

Appendix A

Flow Chart for Notifying National Grid of Revisions to Reactive Capability (excludes planned modifications)

