Paper GCRP 05/12
July 2005

THE NATIONAL GRID COMPANY plc

GRID CODE REVIEW PANEL

GENERATING PLANT PERFORMANCE UNDER SEVERE SYSTEM DISTURBANCE CONDITIONS

I. Introduction/Background

1. Following the blackout incident in Italy (28 September 2003), NGC is keen to ensure that the GB Transmission System and Generating Units connected to or using it would be able to continuously operate should similar system conditions materialise to those experienced in Italy. Specifically NGC is keen to work with Generators to learn how Generating Units would react while the system frequency, although depressed, remained above the level specified for continuous plant operation.

2. NGC believe that such a joint project with generators is especially necessary as we have previously experienced unexpected losses of generation coincident with large system disturbances. For these reasons, NGC initiated a survey to better understand and model plant performance under severe system disturbance conditions especially when both the system frequency and system voltage are depressed.

3. A further objective of the survey was to raise the awareness of this within the generation community and a key target of the survey questionnaire was to help to confirm if the protection settings are appropriate.

4. The overall intention of the survey is a fact finding process rather then a Grid Code Compliant checking of generating plant.

5. The paper seeks to raise the issues and propose a way forward.

II. Key Issue

6. Given the experience of the Italian blackout incident and the observed unexpected tripping of generating plant in the system, NGC, mindful of the Transmission License obligations is concerned about the capability of generating plant to maintain continuous operation during severe system disturbances such as those experienced in Italy and elsewhere.

7. The collected information allows NGC to assess if there is any system security issues while Generators will have the opportunity to review and improve if required their protection settings to avoid unnecessary tripping of their stations. The information in a longer term could also help to improve plant design to increase its operational reliability and hence better system security.

8. Above all we are seeking to demonstrate to ourselves that GB generation will respond appropriately to a severe system disturbance and would avoid an ‘Italian’ type outcome. Given these mutual benefits, NGC would welcome the cooperation from Generators to establish common ground to move the issue

forward.

III. Recommendations

9. The GCRP is invited to:

a) Note NGC's concern of unexpected loss of generation under severe system disturbance conditions.

b) Agree the setting up of a Group under the auspices of the GCRP (proposed TOR in Appendix A) to move the issue forward by

-establishing the confidence level of generating plant being able to maintain continuous operation under severe system disturbance conditions,

-agreeing whether more information is needed and the best way to collect it.

Appendix A

Terms of Reference

Generating Plant Resilience Group

I. Objectives

The overall objective of the Group is to improve the understanding of generating plant performance under severe system disturbance conditions, for instance, similar to those leading to the Italian blackout incident. This is to be achieved by agreeing an effective process in obtaining relevant information for assessment within an agreed time scale.

II. Membership and Reporting

The Group will comprise:
Chairman (NGC)
Secretary (NGC)
Technical representatives (NGC)
GCRP Representatives
and/or other nominees

III. Scope of Work

The Group will aim to:

1) Establish levels of confidence in generating plant performance under severe system disturbance conditions. Potential similarities and differences with Italy/ identify failure modes for different plant types/ discuss possible failure modes which could lead to premature tripping of generating plant.

2) Agree whether more information is needed, and the best way to collect it/ Confidentiality issues/ necessary time scales

3) Dependent on (2) draw up a survey to be taken forward.

IV. Deliverables

The Group will produce a report for GCRP that will outline the views of the members of the Group and make recommendations on the way forward.

V. Time Scale

The first meeting of the Group will be held at NGT House in July/August 2005, and the Group will provide a preliminary report to the GCRP for the 22 September meeting. The Group will produce a final report by February 2006.