SYSTEM TO GENERATOR OPERATIONAL INTERTRIPPING SCHEMES GENERATING UNIT REQUIREMENTS

Introduction

At the GCRP meeting 23rd November 2006 the paper "Guidance on System to Generator Intertrips" circulated by National Grid on the 20th October 2006 was discussed. A number of Panel members considered that, whilst the paper provided a useful start, more comprehensive guidance could be provided to both developers and Users regarding System to Generator Operational Intertripping Schemes. Following this discussion, it was agreed that generator representatives would jointly provide a revised paper for consideration by the Panel.

Background

Grid Code CC6.3.17 states: *"NGET may require that a System to Generator Operational Intertripping Scheme be installed as part of a condition of the connection of the Generator. Scheme specific details shall be included in the relevant Bilateral Agreement."* NGET would normally require such a mandatory scheme as an alternative to transmission infrastructure reinforcement and to enable it to comply with the SQSS.

However, the Grid Code fails to provide any further information regarding what might comprise such scheme, the functional specification and required performance that might be included within the bilateral agreement. The CEGB standard "Design Memorandum 099/86 (1975)" covering the classes of intertrip lapsed following privatisation and no recognised industry standard or other description currently exists, leaving the User exposed to the uncertainty of what requirements may be specified in the bilateral agreement. Concern with the lack of transparency of these arrangements was also expressed by Ofgem in its decision letter to Grid Code Consultation A/05 "Grid Code changes consequential to CUSC Amendment Proposal CAP076 – Treatment of System to Generator Intertripping Schemes".

It is important to the manufacturer, developer and generator to have a common and clear understanding of the range of likely requirements in order to assess the risk and cost associated with different types of generating plant, in the event that such a scheme is required a condition of connection.

Proposed description

It is proposed that Grid Code CC6.3.17 be substituted with the following text:

"NGET may require that a System to Generator Operational Intertripping Scheme be installed as part of a condition of the connection of the Generator and as an alternative to infrastructure reinforcement. The System to Generator Operational Intertripping Scheme, where required, will be defined as a Category 1 Intertripping Scheme, Category 2 Intertripping Scheme, Category 3 Intertripping Scheme, or Category 4 Intertripping Scheme.

A System to Generator Operational Intertripping Scheme would comprise a system which, when armed would disconnect and may be preceded by de-loading one or more selected Generating Units or CCGT Modules or Power Park Modules at a

Power Station in response to a trip signal from the transmission system. Disconnection would be achieved by opening the circuit breaker(s) associated with the Generating Unit, CCGT Module or Power Park Module as appropriate and would be required to take place within a specified period of time from the receipt of the trip signal by the Generator. The trip signal would be provided by NGET normally at its substation adjacent to the Power Station.

A System to Generator Operational Intertripping Scheme will be armed in response to an Ancillary Service instruction given by NGET to the Generator in accordance with BC2.8 during the planned outage of a specified transmission circuit. The trip signal would be initiated in the event of a fault outage occurring on a specified transmission circuit. The resultant load reduction where applicable and opening of the circuit breaker(s) would be achieved within a specified period of time in order to protect an otherwise overloaded transmission or distribution circuit or to preserve the stability of the transmission system. The period within which the circuit breaker(s) should be opened will be as follows

(i) to prevent the thermal overload of a transmission or distribution circuit without delayed auto-reclose: Not faster than the times specified in CC.6.2.2.2.2 but will typically be in the region of 6 seconds to 15 seconds. The opening of the circuit breaker may be preceded by the de-loading the generating unit(s).

(ii) to prevent thermal overload of a transmission or distribution circuit with delayed auto-reclose: As for (i) above but the will also be determined by the timing of the delayed auto-reclose mechanism.

(iii) to preserve the stability of the transmission system: not faster than the times specified in CC.6.2.2.2.2.

The requirement for a System to Generator Operational Intertripping Scheme will be specified in the relevant Bilateral Agreement and will also include the Category of the scheme, the number of the generating units(s) that may be instructed to be armed, and the time within which the load reduction should be achieved where applicable and the circuit breaker(s) should be opened. The relevant Bilateral Agreement will also specify the planned circuit outage(s), the corresponding fault outage and either the overloaded circuit(s) or will identify the system as being required for transmission stability reasons."

Note that the indicative 6 to 15 second trip time is based on the description of a Class 2 trip given in Design Memorandum 099/86.

CUSC Facsimile

It is noted that the facsimile forms to be used in the event that NGET wishes to instruct the arming or de-arming of an intertripping scheme are provided as CUSC Section 4 Schedule 3. It appears inconsistent for a facsimile associated with an Ancillary Service instruction to be given in accordance with the Grid Code to be contained within the CUSC. It is therefore proposed that consideration be given to effectively transferring the facsimile from the CUSC to the Grid Code such that the technical data and operational requirements may be appropriately considered.

Recommendation
The Grid Code Review Panel is invited to:

- Recognise the Grid Code difficencies regarding intertripping schemes
- Review the proposed description to be included within the Grid Code
- Consider the appropriateness of the CUSC facsimile relating to intertrip being included within the Grid Code
- Agree a way forward.