

## **Note for the Grid Code Review Panel**

### **Harmonic tolerances on the Power System**

A number of issues involving Power quality in relation to harmonics and transients on the system have come to our attention. These harmonics and transients are either introduced to the system by a User and/or cause other Users problems in regard to the operation of their plant and equipment. At present there is little in the way of standards within the Grid Code (or NETS SQSS) to set minimum or maximum standards as appropriate for these injections. Such standards would help users to plan investment when connecting to the Power System and would also help facilitate equitable allocation of responsibility for resolution of ongoing issues associated with Power Quality.

Further detail on these two issues is provided below.

#### **1. Transients:**

At present there are no provisions in the Grid Code detailing acceptable levels of voltage transients on the fundamental or higher order harmonics. This particular issue has arisen at a site where the charging of an embedded power station's distribution circuit gives rise to transient harmonics which have triggered protection relays at a local transmission connected Power Station.

Without a view as to what is a reasonable level of transients we cannot determine whether it is the protection relays which are at fault (because they should filter the harmonics) or that levels of transient introduced by the energisation of the circuit should be considered unacceptable. Whilst resolution of this example is not the primary concern for resolution by the GCRP, it is an example which could be replicated elsewhere. We have agreed in conjunction with one of the affected parties to bring the broader issue to the attention of the GCRP.

#### **2. Allocation of rights to emit harmonic pollution.**

The current process for managing harmonic pollution injections onto the Power System has caused concerns to be raised by a number of connectees. In particular, headroom to emit harmonics is provided on a first come first served basis meaning that later connectees may have less freedom to emit headroom and thereby required to install additional filtration. Furthermore, decisions on allowable levels of pollution are reliant on harmonic data from Users connecting ahead of other Users. On occasions, this can lead to a chain where a number of Users cannot make final investment decisions on filtration equipment until data from other Users has been submitted and analysed. This can mean that investment decisions on filtration equipment cannot be taken at the most efficient

time, i.e. at the initial design and planning phase. This issue has arisen at a number of sites in the past 12 months.

This note contains an initial description of the issues by National Grid. In the light of discussion at the Panel on the issues raised in this note, National Grid proposes to report back further to the November 2009 GCRP including, if the Panel agreed it was appropriate, proposed Terms of Reference for a possible Working Group to consider the issues..