
Black Start Generator – Defining a ‘Local Shutdown’
(Paper by NGET)

Introduction

1. This paper outlines an outstanding issue raised during BSC modification P231 in relation to the use of a Black Start Generator(s) when reenergising part of the Transmission network following a localised shutdown, and the subsequent suspension of the GB electricity market. This has also been raised previously at the Grid Code Review Panel meeting under minute number 1270, currently with an open action to develop a working group to explore this issue.

Modification P231

2. The aim of Modification Proposal P231 was to improve transparency of the arrangements and obligations associated with a Black Start or Fuel Security Code (FSC) event within the BSC.
3. P231 was raised by National Grid in December 2008 and the solution was based on the discussions from BSC Issues 32 ‘Black Start’ and 33 ‘Fuel Security Code’. The final proposal was approved in June 2009 and implemented in November 2009. As a result of introducing P231, the BSC now provides clearer processes for the industry to follow in the event of a Black Start or FSC direction.

What is a Black Start?

4. A ‘Black Start’ is a recovery process for restoring electricity on the Transmission System (and Distribution System) following a Total or Partial shutdown. Power stations connected to the de-energised part of the system are generally not capable of re-starting and rely on an ‘external’ source of electricity from the Transmission System (or Distribution System) to start up their generating units.
5. Certain power stations have contracts with the System Operator (National Grid) where they will be able to initiate a Black Start following a Total or Partial shutdown, known as Black Start generators. These power stations do not require an external source of energy to produce electricity. In most instances, such power stations use open cycle gas turbines to start their main units. This station would then energise parts of the Transmission system and provide an ‘external’ source of electricity to start those power stations that don’t have Black Start capability. These ‘power islands’ can gradually be developed further such that the Transmission System (and Distribution System) can be fully reenergised and then demand can be gradually re-connected.

Background – what is the current issue?

6. Currently if any part of the GB Transmission System became disconnected from the remaining healthy system, resulting in shutdown of the disconnected part (i.e. partial shutdown), the System Operator will work to restore the disconnected part of the system either by:

- Using the existing healthy Transmission System to re-energise, or
- Using a Black Start generator to energise the part of Transmission System that shutdown, creating a 'Power Island' and eventually reconnecting this back to the healthy Transmission System

The latter option is only possible if an available Black Start capable generator is located in the part of Transmission System that has shutdown.

The System Operator will have many factors to consider which will ultimately influence the option that is used.

7. If a Black Start generator is utilised to restore a disconnected part of the Transmission network, under the current BSC, this would initiate the suspension of the GB electricity market. There is no further determination made as to the size of the loss and whether it would be appropriate to suspend the whole GB market; instead the determination is defined by the use of a single Black Start generator. This would potentially impact every User of the GB market resulting in significant disruption.
8. It would seem sensible that this issue is examined further to determine if it is always appropriate to suspend the GB market when a Black Start generator is instructed to operate, and whether potentially significant disruptions to the GB electricity market could be avoided in the future whilst still ensuring affected parties are reimbursed accordingly.

Recommendation

9. A recommendation is made to form a BSC Standing Issue Group to discuss the issue and identify any relevant changes to the BSC and/or Grid Code. The Issue group members should be sought from those involved in BSC Modification P231, supplemented by interested parties from both BSC and Grid Code members. We propose that this group commences in June 2011.