



## Report on Issue 42 - Defining a 'Local Shutdown'

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| <b>Meeting Name</b>     | BSC Panel   |
| <b>Meeting Date</b>     | 11 August 2011  |
| <b>Purpose of paper</b> | For Information   |
| <b>Summary</b>          | National Grid raised Issue 42 to examine <b>the appropriateness of the BSC's and Grid Code's Black Start rules</b> in the event of a 'local' shutdown of part of the Transmission System. This paper summarises the Issue 42 Group's conclusions and Appendix 1 contains its full discussions. We invite you to note these and to close Issue 42. |

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### 1. What are the BSC's current Black Start arrangements?

- 1.1 Section G of the BSC contains the arrangements for suspending normal BSC market operations in the event of a Black Start situation. This includes suspending the normal operation of the Balancing Mechanism, the notification of contract volumes and the calculation of energy indebtedness (i.e. credit positions). In this situation, a single Imbalance Price applies and the Lead Parties of any BM Units which have been given Black Start instructions under the Grid Code are entitled to compensation under the BSC.
- 1.2 Operating Code (OC) 9 of the Grid Code defines two types of Black Start situation: a Total Shutdown (where generation has ceased in the whole Transmission System) or a Partial Shutdown (where **generation has ceased in only part of the Transmission System**). **The BSC's current trigger for suspending the market is the notification by National Grid to Parties that either a Total Shutdown or a Partial Shutdown, as defined in the Grid Code, has occurred.**

### 2. What is the issue?

- 2.1 The Issue 42 Group agrees that there is a category of 'localised' Partial Shutdown for which suspending the market would be a disproportionate response, and would cause unnecessary disruption. You can find the Group's reasons for this view in Appendix 1.

### 3. What is the solution?

- 3.1 The Group agrees that an additional trigger or threshold should be added to the BSC, so that the market is only suspended in the event of a Partial Shutdown if this additional BSC trigger/threshold is also met. This will avoid automatically suspending the market for any small, localised shutdowns.
- 3.2 The Group has differing views on which trigger/threshold to use in the BSC, and it recommends that a BSC Modification Proposal is raised to assess these further. The Group does agree that any trigger or threshold must be based on information which is quickly available to National Grid in real time.
- 3.3 The Group also agrees that any BSC Modification Proposal will need to consider what compensation arrangements the BSC should apply to Parties who are affected by a localised shutdown in which the market is not suspended.

- 3.4 Depending on the chosen BSC trigger/threshold, a consequential change to the Grid Code may be needed to **add a new definition of 'Local Shutdown'**.
- 3.5 The Group has also identified some possible **ambiguity in the Grid Code's existing definition of Partial Shutdown**. This could potentially **lead to different interpretations of what types of 'localised' shutdown** currently constitute a Black Start event, and may therefore require further consideration.
- 3.6 The Groups full discussion, their views and thoughts can be found in Appendix 1.

#### 4. What areas need further assessment as part of a Modification Proposal?

- 4.1 The Group agrees that the following should be assessed during the progression of any BSC Modification Proposal resulting from Issue 42:
- 1) **What is the appropriate dividing line between a 'Local Shutdown' and a Partial Shutdown? How big/severe should a shutdown be before the market is suspended and why?**
  - 2) How should this dividing line be reflected in the BSC?
  - 3) What BSC arrangements, if any, are required to compensate the following participants in the **event of a 'Local Shutdown'?**
    - a) Generators issued with Black Start instructions by National Grid;
    - b) Other generators in the affected area who are prevented from generating by the incident; and
    - c) Suppliers in the affected area who lose demand as a result of the incident.
  - 4) How would this BSC compensation interact with Imbalance Charges and compensation arrangements in other codes (e.g. in the CUSC)?
  - 5) Are any Grid Code changes needed?

#### 5. Next steps

- 5.1 The Group agrees that the next step should be the raising of a BSC Modification Proposal, and that there is no need for any further discussion under Issue 42.

#### 6. Recommendations

- 6.1 We invite you to:
- a) **NOTE** the Issue 42 Group's discussions and conclusions;
  - b) **NOTE** the **Group's** unanimous recommendation that a BSC Modification Proposal should be raised;
  - c) **NOTE** that a consequential Grid Code change may be needed depending on how the BSC Modification Proposal is developed; and
  - d) **Note** Issue 42 is closed.



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**List of appendices**

Appendix 1 – Issue 42 Group's detailed discussions

Appendix 2 – Issue 42 Group's membership



## Appendix 1 – Issue 42 Group’s detailed discussions

### 1. What is the issue?

- 1.1 The Group agrees that there is a defect within [Section G](#) of the BSC, in that it automatically suspends the market when there is a Partial Shutdown (as defined in the Grid Code). This could include ‘local’ events in which a small part of the Transmission System has shut down in a single area, and where suspending the market would be a disproportionate response.
- 1.2 The Group concludes that this is an issue for two reasons:
- **It could lead to the market being suspended in response to a local shutdown**, even if the cost and disruption of this to Parties is greater than that of allowing the market to continue; and
  - **It could lead to National Grid being reluctant to issue Black Start instructions** even if this is the best/quickest way of restoring supply, because National Grid would know by doing so it would trigger suspension of the market.
- 1.3 The Group believes there is a secondary issue in that there may also be uncertainty about how to interpret the Grid Code’s definition of Partial Shutdown (and hence uncertainty over the current trigger for suspending the market).
- 1.4 The definitions of Total Shutdown and Partial Shutdown in [OC9](#) of the Grid Code are as follows:
- **‘A "Total Shutdown" is the situation existing when all generation has ceased and there is no electricity supply from External Interconnections. Therefore, the Total System has shutdown with the result that it is not possible for the Total System to begin to function again without NGET’s directions relating to a Black Start.’** (OC9.4.1)
  - **‘A "Partial Shutdown" is the same as a Total Shutdown except that all generation has ceased in a separate part of the Total System and there is no electricity supply from External Interconnections or other parts of the Total System to that part of the Total System. Therefore, that part of the Total System is shutdown with the result that it is not possible for that part of the Total System to begin to function again without NGET’s directions relating to a Black Start.’** (OC9.4.2)
- 1.5 Those members of the Issue 42 Group who were part of the P231 Workgroup<sup>1</sup> initially believed that the Grid Code’s definition of Partial Shutdown means the following:
- If National Grid issues a Black Start instruction to any Black Start Station in any circumstance, even if just to a single Black Start Station, then this always constitutes a Partial Shutdown under the Grid Code and the market will therefore always be automatically suspended under the BSC (this has also historically **been National Grid’s interpretation of the Grid Code**); and

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<sup>1</sup> [P231](#) ‘Black Start and Fuel Security Code Procedures under the BSC’ was implemented in 2009. The treatment of ‘local’ shutdowns fell outside its scope, and the P231 Workgroup recommended that a separate Issue Group consider it at an opportune time. See pages 33 and 36 of the P231 Assessment Report.



- Conversely, if National Grid does not issue a Black Start instruction to any Black Start Station during a shutdown of part of the Transmission System, then this is not classified as a Partial Shutdown (as defined in the Grid Code) and the market will continue normally under the BSC.

1.6 Other Issue 42 Group members initially shared this view. However, the Group's subsequent discussions have raised possible doubts on this interpretation because:

- **The Grid Code's definition of a Partial Shutdown refers to a situation in which "it is not possible" for National Grid to restore the system without issuing Black Start directions.** The Grid Code is silent on situations in which National Grid has a choice over whether to issue Black Start directions but believes such directions to be the best/quickest solution. The Group notes the example of the August 2003 London blackout, where National Grid had **to restore power using the remaining 'healthy' part of the Transmission System** as no Black Start Stations were in the shut-down part of the network. The Group notes that, if Black Start Stations had been available, National Grid would have had to make a decision as to whether issuing Black Start directions was a better/quicker approach. The Group considers that if National Grid chose to issue Black Start directions in this hypothetical situation, there is some uncertainty as to whether it would constitute a Partial Shutdown. This is because it would not meet **the part of the definition which states that 'it is not possible for that part of the Total System to begin to function again without NGET's directions relating to a Black Start'**. The Group notes National Grid's advice that, where part of the network is down, it is always possible to re-energise it from the 'healthy' system – it is just that this might take a long time. National Grid and some members of the Group therefore interpret **the Grid Code's** definition of a Partial Shutdown to mean 'not possible' *within a reasonable time*.<sup>2</sup>
- **Conversely, an event could be classified as a Partial Shutdown under the Grid Code's definition even if National Grid does not issue any instructions to Black Start Stations.** This is because the definition refers to "NGET's directions relating to a Black Start". The Grid Code's definitions of Total Shutdown and Partial Shutdown refer to 'Black Start directions', although these are not defined and (with the exception of OC9.4.7.5) the rest of OC9 refers instead to 'instructions'.<sup>3</sup> The 'instructions' described throughout OC9.4.7 do not just cover those given to Black Start Stations but also include a variety of other instructions (such as the implementation of Local Joint Restoration Plans, instructions to other generators and Distributors and the alteration of demand).

1.7 The Group concludes that the current definition of a Partial Shutdown, and thus the current trigger for suspending the market, may therefore be less mechanistic and more ambiguous than previously realised. Despite this, it agrees that a change is still needed to prevent the market being automatically suspended under the BSC whenever a Partial Shutdown (as currently defined in the Grid Code) occurs.

<sup>2</sup> Noting that one of the overall objectives of OC9 is "To achieve, as far as possible, restoration of the Total System and associated Demand in the shortest possible time" (OC9.2.1).

<sup>3</sup> The Grid Code's definitions are also circular in that they define a 'Black Start' as existing when there is a Partial Shutdown, and a Partial Shutdown as existing where there are Black Start directions.

## 2. What is the solution?

### **Additional BSC trigger or threshold for suspending the market**

- 2.1 The Group agrees that the BSC and Grid Code need to recognise a category of events in which National Grid issues Black Start directions/instructions but the market is not suspended. The Group agrees that an additional trigger or threshold should be added to the BSC in order to avoid automatically suspending the market for any small, localised shutdowns during which National Grid gives Black Start directions/instructions.
- 2.2 The Group agrees that this requires the BSC to be able to distinguish between two different scenarios:
- A Partial Shutdown in which the market is suspended because the additional BSC trigger/threshold is met; and
  - A Partial Shutdown in which the market is not suspended because the additional BSC trigger/threshold is not met.
- 2.3 The Group agrees that it is open for further discussion whether the second category of event should still be called a Partial Shutdown in the Grid Code, or whether **a new Grid Code definition of 'Local Shutdown'** is needed. Either way, there is unanimous agreement that there needs to be some dividing line between the two categories, and this dividing line needs to be defined in such a way that National Grid can quickly decide which category a particular event falls into (using information available to it close to real time). The Group agrees that the trigger/threshold for suspending the market should always be contained in the BSC, as it is BSC Parties who are directly affected.
- 2.4 The Group agrees that the additional BSC trigger/threshold must measure the point at which a shutdown **becomes significant enough to suspend the market. The Group agrees that this must be a 'hardwired'** trigger so that industry has certainty of the situation. For example, a solution whereby the Panel meets to decide whether the market should be suspended would not give certainty and may not be practical if Panel Members are in an area of the country without power.
- 2.5 The Group has differing views on what is the most appropriate trigger/threshold. The table on the following page outlines the possible triggers/thresholds suggested by members.

| Suggested trigger/<br>threshold  | Potential pros  | Potential cons   | Conclusion   |
|--|---|--|--|
| Loss of a certain % or MW amount of demand and/or generation from the system                     | Mechanistic and easy to identify?   | Impact of a certain % or MW loss will differ depending on its location. For example, losing 400MW in Scotland will have a much larger impact than losing the same amount in central London. May be difficult for National Grid to precisely measure this threshold in real time. | Potential candidate for further assessment as part of a Modification Proposal. |
| Loss of a certain % or number of GSP Groups from the system (e.g. suspend if > 1 GSP Group lost) |   | Shutdown may not map well to GSP Groups – e.g. would not want a very small event on a border between 2 or more GSP Groups to cause suspension of the market. Impact of losing one GSP Group may be different to another (e.g. North Scotland compared with London).              |  |
| Loss of a certain % or number of circuits from the system  |   | None identified.   |  |
| Loss of a certain % or number of customers   | Mechanistic. Blackouts ultimately affect customers, so could be an appropriate measure. | May not be apparent to National Grid close to real time (but depends how precisely the threshold needs to be measured – for example, National Grid could establish an order of magnitude by contacting the relevant Distributor(s)).   | Group believes this would not be a suitable trigger.                           |

- 2.6 **The Group notes that, as a market decision, there is unlikely to be a 'right' technical figure** to use. The key question is how to decide the point at which not suspending the market does more harm than suspending it? The Group notes that care should be taken not to create perverse incentives to trigger the threshold.

- 2.7 The Group agrees that, once market suspension has been triggered, the market should remain suspended until the Panel decides to resume it **under the BSC's existing Black Start rules**. If the suspension is triggered by a certain percentage of generation being lost, the market should not then automatically resume if this percentage drops back down below the threshold.

**New compensation arrangements to apply when the market is not suspended**

- 2.8 The Group agrees that, whatever the trigger/threshold, consideration should be given to what compensation arrangements should apply to **Parties who are affected by a 'local' shutdown in which the market is not suspended**. The Group agrees that the aim of any arrangements should be to hold affected Parties neutral to the event. This could potentially cover:
- Generators who are issued with Black Start instructions by National Grid;
  - Other generators in the affected locality who are prevented from generating by the incident (although one member believes this may already be catered for under the existing compensation provisions in the CUSC); and
  - Suppliers in the affected locality who lose demand as a result of the incident (although one member notes that similar arrangements have been suggested and rejected under previous BSC Demand Control modifications). **The Group agrees that, because contracts are 'firm', Suppliers outside the locality who have contracted with affected generators for 'lost' demand will not be disadvantaged.**
- 2.9 The Group notes that the BSC currently allows a Party to claim **'Avoidable Costs'** through a post-event claims process, **where the Party's BM Unit has been given a "black start instruction"** by the Transmission Company.<sup>4</sup> The Group agrees that this should continue to apply **under a 'local shutdown'** even if the market is not suspended. The Group notes that the Avoidable Costs arrangements are currently based on the application of a single imbalance price during market suspension. They may therefore need amending for circumstances in which Black Start directions are issued but the market is not suspended, and in which dual cash-out prices continue to apply.
- 2.10 The Group has differing views on how to apply this compensation – **e.g. using deemed 'correcting' volumes, and settling them at a 'market' price or the Reverse Price**. The Group also has differing views on the practicalities/appropriateness for applying compensation to Suppliers (including the potential difficulty of calculating deemed Supplier volumes), but suggests that previous work undertaken for BSC Modifications on Demand Control could form a starting point for further discussions. The Group notes that care should be taken **to avoid 'double-counting' with** any compensation arrangements under other Codes, such as the disconnection compensation payments introduced to the CUSC by [CAP048](#).

<sup>4</sup> Section G3.3 of the BSC defines a "black start instruction" as being any instruction given by the Transmission Company to the Lead Party of a BM Unit pursuant to OC9.4.7.4, Balancing Code (BC) 2.7 or BC2.9 of the Grid Code, and which relates to any Settlement Period(s) during a Black Start. G3.3.1(a) is clear that this applies to any BM Unit which is the subject of such instruction, regardless of whether or not it relates to a Black Start Station.



**Full or partial market suspension?**

- 2.11 The Group notes that the BSC's current market suspension provisions are 'all or nothing', and has considered whether it would be feasible and/or appropriate to:
- a) Only suspend some parts of the market during a 'local' shutdown; and/or
  - b) Only suspend the market in the part of the country which is affected by the 'local' shutdown.
- 2.12 The Group agrees that, because Parties' contracts are global, approach b) would be impractical. It also agrees that approach a) is likely to cause more disruption than suspending the market nationally and then having post-event compensation arrangements for affected Parties.

**3. What questions need to be considered in a future Modification?**

- 3.1 The Group agrees that there are a number of areas that would need to be assessed further if a BSC Modification Proposal is raised to progress its recommended solution:
- 1) What is the appropriate dividing line **between a 'Local Shutdown' and a Partial Shutdown?** How big/severe should a shutdown be before the market is suspended and why? (Potentially this could include analysing the cash-flow disruption of suspending versus continuing the market).
  - 2) How should this dividing line be reflected in the BSC?
  - 3) What BSC arrangements are required to compensate affected **participants in the event of a 'Local Shutdown'?**
  - 4) How would this BSC compensation interact with Imbalance Charges and compensation arrangements in other codes (e.g. in the CUSC)?
  - 5) Are any Grid Code changes needed?

**4. Conclusions**

- 4.1 The unanimous view of the Issue 42 Group is that issues exist in the Black Start provisions in the BSC and possibly the Grid Code, and that the problems with the current BSC drafting should be resolved through the Modification process.
- 4.2 The Group believes that the BSC should be amended so an additional trigger/threshold is required for suspension of the market in the event of a Partial Shutdown, so suspension is not automatic as it is currently. This may also require a new definition of **'Local Shutdown' in the Grid Code.**
- 4.3 The Group believes that that Issue 42 should now be closed.



## Appendix 2 – Issue 42 Group’s membership

| <b>Member</b>   | <b>Organisation</b>               | <b>21/06/11</b>   |
|-----------------|-----------------------------------|---|
| Kathryn Coffin  | ELEXON (Chair)                    | Y   |
| Michael Edwards | ELEXON (Lead Analyst)             | Y   |
| Ben Smith       | Proposer (National Grid)          | Y   |
| Gary Henderson  | IBM for Scottish Power            | N   |
| Esther Sutton   | E.ON                              | Y   |
| Garth Graham    | SSE                               |  |
| Bill Reed       | RWE Npower                        | Y   |
| Martin Mate     | EDF                               | Y   |
| <b>Attendee</b> | <b>Organisation</b>               | <b>21/06/11</b>   |
| John Lucas      | ELEXON (technical support)        | Y   |
| Nilton Green    | National Grid (technical support) | Y   |