Supplemental Balancing Reserve

From Forecasting to Despatch

Pete Chandler
Control Implementation Manager
SBR Units Contracted

Long notice start up required
- Eggborough: 52 Hours
- Fiddlers Ferry: 26 Hours
- South Humber: 22 Hours

Within day start up required
- Corby: 7 Hours
- Peterhead: 6 Hours

Short notice instruction
- Deeside: 2 ½ Hours
- Killingholme: 2 Hours
- South Humber headr’m: 30 Mins
- Keadby GT: 30 Mins
- Fiddlers Ferry GT: 30 Mins

Total run up time = Notice to deviate from zero plus total ramp to Max Export Limit
SBR: Operational Principles

Only utilised when all market based actions exhausted (excluding 900MW regulating reserve)

Market will always be informed before respective stations are dispatched.

EMN will be issued prior to a dispatch (i.e. synchronisation) except in exceptional circumstances.

Plant dispatched in economic order (utilisation price and duration required), not convenience (i.e. warm plant not used instead of cheaper cold plant).

Minimal plant dispatched to maximum output rather than multiple plant dispatched to lower levels.
Supplemental Balancing Reserve Information

- Plant Dynamics
- BMU Identifiers
- Price Information
- Dispatch Processes

Available on National Grid SBR Webpages
Projected Margin Information

www.bmreports.com

Please note: published surpluses include the forecast level for wind generation in short term time scales up to 14 days ahead and then at a seasonally dependant load factor for 2-52 weeks ahead. Hydro is at full output useable so is therefore dependent on there being sufficient sources of water for this level to be achieved.

OC2 data submitted under the Grid Code provides information to the market and is the basis for our decision making.
SBR start up and dispatch comparison

**SBR Start Up ‘Warming’**

- De-rated generation < Demand
- To industry via SONAR
- Up to 52 hours
- To industry via SONAR (Warning message is on BMRS)

**SBR Dispatch**

- All available plant and operating reserve (excl 900MW) exhausted in plan
- To industry via BMRS
- Max 6 hours, min 30 mins
- Not applicable

<table>
<thead>
<tr>
<th>Trigger</th>
<th>De-rated generation &lt; Demand</th>
</tr>
</thead>
<tbody>
<tr>
<td>Publication</td>
<td>To industry via SONAR</td>
</tr>
<tr>
<td>Lead Time</td>
<td>Up to 52 hours</td>
</tr>
<tr>
<td>Stand down</td>
<td>To industry via SONAR (Warning message is on BMRS)</td>
</tr>
</tbody>
</table>
Based on margin calculations…

Amended by OC2 generator data (de-rated by factor of historic availability & reliability)…

Compared to the demand forecast…

… if there is a shortfall, we consider warming instructions to keep plant available.

Industry and National Grid will be basing decisions on OC2 data - therefore its accuracy is critical.
Long Notice Start Up Instruction: Example 1

- **D-2**: updated wind & energy forecasts are compared to OC2 generator data & margin calculated.

- **D-2**: Decision made to Warm EGGB units.

- **D-2 c. 15:00**: Warming instructions issued to station.
  - **D-2**: BMRS Warming message(s) issued.
  - **D-2**: SONAR message(s) issued.

- **D-2, 15:00 to D 13:20**: Margin calculations are rerun every SP & if margin improves, plant may be stood down.

- **D 13:20**: EGGB changes NDZ to 85 minutes & BOAs issued.
  - 15:00 units synchronized.
Long Notice Start Up Instruction: Example 2

- **D-1**: Decision made to Warm FIDL (& SHBA) units

- **D-1**: updated wind & energy forecasts are compared to OC2 generator data & margin calculated

- **D-1** 14:00: Warming instructions issued to station
  - **D-1**: BMRS Warming message(s) issued
  - **D-1**: SONAR message(s) issued

- **D-1** 14:00 to D 13:50: Margin calculations are rerun every SP & if margin improves, plant may be stood down

- **D 13:50**: FIDL changes NDZ to 5 minutes & BOAs issued. 15:00 units synchronized.
Short Notice Start Up Instruction

D-1, 11:00 → D: Based on System Operating Plan (updated at 4 hour intervals) with Generator Data from the BM

Compared to the latest demand forecasts & operating margins (weather, generator availability, interconnector updates)

If the shortfall is between 500MW & 700MW, the Control Room will consider issuing Warming instructions so to keep plant available.

A Grid Code System Warning (e.g. EMN) will be issued ahead of any SBR plant being despatched.
Dispatch: An Alternative View

Fri
Margins identified as tight for Mon/Tue/ Wed peaks
Visible to industry on BMRS

Sat
(EGGB) Long Notice SBR Warmed for Mon peak

Sun
(FIDL & SHBA) Long Notice SBR Warmed for Mon & Tue peaks
EMN issued for Mon peak

Mon
SBR dispatched
EMN issued for Tue peak
Long Notice SBR warmed for Tue & Wed peaks
EMN issued for Wed peak

Tue
SBR dispatched
Long Notice SBR warmed for Wed peak
EMN issued for Wed peak

Wed
SBR dispatched
## SBR Utilisation – Example Costs, Impact on BSUoS and imbalance prices

<table>
<thead>
<tr>
<th>Scenario</th>
<th>Number of Days NISM Warning Issued</th>
<th>Number of Days SBR Required</th>
<th>Average Volume of SBR Required (when needed)</th>
<th>Maximum SBR Volume Required</th>
<th>Estimated Cost of SBR Utilisation for Winter '16</th>
<th>MW Shortfall (after all SBR utilised) Priced at VoLL</th>
<th>Total SBR Utilisation and MW Shortfall Valued at VoLL</th>
</tr>
</thead>
<tbody>
<tr>
<td>Normal Weather</td>
<td>0</td>
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<td>0</td>
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<tr>
<td>Normal Weather</td>
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<td>£13,649,952</td>
<td>£4,164,025</td>
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</tbody>
</table>

1. 2.0 GW CDM, 2.5 GW Mainland Europe Import, Flat Irish Interconnector, ~ 89% de-rating for all thermal generation, includes short-term OR
2. 1.6 GW CDM, 2.5 GW Mainland Europe Import, 750 MW Ireland Export, ~ 89% de-rating for all thermal generation, includes short-term OR
The Financial Impact of SBR

Testing Costs

• Are recovered on the day they are incurred
• Are reconciled over period 01 Nov. to 28 Feb. (via RF invoice, issued c.14 months later)

Availability Fees

• Are recovered on a daily basis from 01 Nov. to 28 Feb
• Estimated to be £935,000 per day (£114million for the contract duration)

Utilisation Fees

• Are subject to Ofgem approval on each occasion
• Noting this, are sought to be recovered on the day they are incurred
• SBR volume is set to £3,000/MWh & this sets cash out for that SP

Please note CMP262, in Modification Process at the moment…..
Long Notice SBR Warming decisions will be made based on OC2 data. Accuracy of this data is vital.

Operational messages will continue to appear on BMRS & the market is informed prior to any SBR instruction.

A Grid Code System Warning (e.g. EMN) will be issued prior to any dispatch (unless exceptional circumstances).

SBR is instructed after all other market based actions, but before emergency services.