National Grid
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NOTE TO INDUSTRY – BOA Volumes to BMUs

Introduction

At two recent industry forums (May EBS IT Group and Grid Code Review Panel) a major topic of discussion related to the potential for simultaneous BOAs to be issued to a BMU by the new EBS. In addition, there were questions relating to the overall volume of BOAs being issued by the EBS.

National Grid has taken note of the feedback provided, recognises the concerns raised and is working to ensure the potential volume of BOAs being issued by the EBS system will be manageable in real time by the industry.

Key points

1. To address major concerns raised by operators about receiving simultaneous or multiple BOAS for the same BMU we can confirm that the EBS system will only issue a single BOA to any one BMU per 5 minute cycle. This is in effect unchanged from the current BM practice.

2. In response to questions asking how the volume and pattern of BOAs may change with EBS, we propose to run a series of tests in July and in August where we will compare how the real time BM operates the live system against the EBS operating a simulator in real time so that the parameters of the EBS can be tuned for stability. We will publish data soon after to give participants a view of how BOA activity might be different with EBS and so determine how this might affect their own processes.

3. To allow all parties to optimise or provide feedback on how their systems will operate with BOAs issued by the EBS during a series of Saturday morning trials starting at the end of August. During the weekdays between the trials EBS settings and parameters will be optimised to find the most appropriate overall pattern of operation

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Background information

The following notes provide detail about how BOAs are currently issued with the BM system and how this might change with the EBS system. It also considers how we are working to ensure the potential volume of BOAs being issued by the EBS system are manageable and also explains how we are intending to provide the industry with further information and obtain feedback in this area.

Existing BM system

The Despatch component of the BM system is used by the System Operator to manage demand changes over the next four hours, minimise constraints on the transmission network and allocate response to cover the largest loss.

It does this by using real time metering to both drive a real time demand predictor and to monitor active constraints on the system which together with all BMU parameter and bid data is used by a despatch algorithm to determine the best economic BOAs (Bid-Offer Acceptances) that are required to be issued to ensure the system can be securely balanced in real time within frequency limits.

The cycle time that the despatch algorithm operates to is 5 minutes (and this has not changed since the system was introduced 25 years ago and is the international norm). The output advice from the algorithm is used by the control operators to manually create the BOAs that are then sent to the CPs (Control Points).

Over recent years a significant amount of larger coal generation has been retired and replaced with renewable generation. As a consequence the average size of BMUs has reduced whilst the size of overall error has increased due to PV, Interconnector swings and wind volatility. This has resulted in the System Operator having to issue an ever greater MW volume of BOAs to an ever greater number of CPs per 5 minute despatch cycle in order to maintain system balance and security.

EBS system

It is as a consequence of this increase in BOA activity (especially under high wind/low demand conditions) that the BOA creation process is being automated in the new EBS system.

The new EBS system has started to be fed with a parallel stream of real time data and matched up to a power system simulator from the beginning of March. The new automated BOA instruction process was initiated and the initial results showed that a far higher number of BOAs would be issued than with the existing BM system – predominantly because the new system was intent on absolute accuracy at every point of the despatch window.

Since March a programme of work has been underway to tune the algorithm to make it less sensitive to small perturbations in the demand forecast and to improve the mathematical model so as to reduce the error between the algorithmic solution and the BOA creation engine which had been causing test BOA instructions to hunt between consecutive despatch runs. The EBS system has also now been changed to only issue a single BOA to any one BMU in any one cycle.

BOA comparison

The first batch of improvements are now being rolled out to the test EBS system and a real time parallel simulation of a full day of operation is due to be undertaken during the first week of July to enable a comparison of BOAs issued by the EBS system (albeit against a simulator) to be compared against the actual number of BOAs issued during the same time period by the BM system in real time operation.

A second batch of improvements are also due to be rolled out towards the end of July enabling a further parallel simulation and comparison with the BM system to be undertaken during the first week of August. The results of these comparisons will be shared with the industry as soon as possible after the simulations.

EBS despatch trials

It is proposed that for three hours during the mornings of 20th August, 3rd September and 10th September the despatch of BOAs is switched over from the BM system to the EBS system so as to trial and prove the stability of the new EBS in real time and with the real power system.

During this period the existing BM system will continue to operate in shadow mode such that it can pick up real time despatch immediately should any difficulty in balancing the system be encountered with the new EBS system.

The results of each trial will also show the pattern and frequency of how BOAs are issued by the EBS and will enable any feedback from Industry participants to be considered prior to making any adjustment to despatch parameters before the next trial. In this way it is intended that an optimal set of parameters can be determined that are suitable for both system operation and plant operation.