nationalgrid

# EBS Project
# External Testing and Transition Overview

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# 1 Introduction

## 1.1 Overview

National Grid is replacing its Balancing Mechanism (BM) System with a new Electricity Balancing System (EBS). Transition from the BM System to EBS is expected to take place in 2013 (Reference 1).
EBS Technical and IT issues that may impact third party participants are discussed at the Information Technology sub-group (EBSIT) of the Electricity Balancing System Group (EBSG). Terms of reference and other details for EBSIT may be found via the link at reference 2. At the fourth EBSIT meeting in September 2012, there were a number of discussions regarding the testing and transition impact on participants in the electricity market. This document has been written in response to an action raised on National Grid to provide one overview document describing the full and complete impact and involvement of participants in external testing and transition to EBS.

## 1.2 Purpose and scope

The scope of this document is limited to the EBS Project only. It is not intended to provide any information regarding the impact of any other National Grid projects or changes.
The target audience of this document is primarily Market Participants (MPs) and Suppliers of EDT and EDL software (Suppliers). It will however be a useful source for anyone with an interest in the balancing mechanism or external interfaces and output from the EBS.

The main purpose of this document is to provide one source to present a high-level overview of the impact on MPs and Suppliers of National Grid transitioning from BM to EBS. This will include an indication of the activities and roles that MPs and Suppliers are expected to perform.

## 1.3 References and Links

1) National Grid Electricity Balancing System Webpage
   http://www.nationalgrid.com/uk/Electricity/Balancing/EBS/
2) EBS IT Subgroup Webpage
   http://www.nationalgrid.com/uk/Electricity/Codes/gridcode/workinggroups/EBS+IT+Subgroup/
3) EBS Project - Participant EDT Transition (Discussion document from EBSIT[3])
4) Electricity Balancing System Group Webpage
   http://www.nationalgrid.com/uk/Electricity/Codes/gridcode/workinggroups/ElectricityBalancingSystemGroup/
5) Operational Forums
   http://www.nationalgrid.com/uk/Electricity/Balancing/operationalforum/
6) EBS Project - External EDT & EDL Test Approach (Document issued following action from EBSIT[4])

# 2 Background

## 2.1 EBS Overview

The EBS Project is delivering both a new application and completely new architecture. This extends to the network and externally facing network devices. The EBS design is out of the scope of this document, however it should be noted that a significant feature of the new system will be improved resilience and reliability. This is significant for the nature and extent of internal and external testing that needs to be completed.

It has been decided not to change external interfaces at the point of transition to EBS. This considerably reduces the risk for EBS go-live and the testing impact on Suppliers, MPs and other third parties – for example Elexon. Consideration has also been made to minimise the impact on and risk to MPs at the point of cut-over. A discussion of the EBS transition approach for MPs is documented in Reference 3.
Risk reduction and mitigation is a key feature of the transition approach employed for EBS. As a consequence the successful testing, verification and validation of external interfaces to EBS, notably those with MPs, is rated highly on the list of essential prerequisites for starting transition.
Changes to the EDT and EDL interfaces (and a consequential change to the BMRA interface, reporting and Tibco messaging) will be implemented at least six months after EBS go-live. The new changed interfaces are known as the EDT* and EDL* versions. The external testing and transition phases for the '*' versions are not on the critical path for EBS go-live and this is reflected in a separate stream of activity for National Grid, Suppliers and MPs (as described below).

The significance of the EDT and EDL links to MPs will be reflected by the issue of a comprehensive communication plan that will be prepared and distributed in advance of the transition phases. This plan will help guide MPs through the EBS transition process and identify contact details to answer any questions and resolve any issues.
Any party with an interest in EBS can keep themselves up to date with developments and progress via a number of communication channels. In addition to EBSIT (Ref 2), information will be provided via the EBSG (Ref 4), the Operational Forum and Transmission Operational Forum Update (TOFU) publications (Ref 5).

### 2.2 Layout of this Document

This document is organised around the two steams of activity for National Grid and MPs;

- Activity on existing external interfaces – essential for EBS go-live (Section 3)
- Activity on new and changed interfaces – planned for implementation after EBS go-live (Section 4)

### 2.3 Exclusions

This document is intended to provide a high-level overview only. No detailed testing or transition activity will be presented. Readers are directed to the document set provided via the EBSIT forum and the EBS webpage (references 1 and 2).

This document will not include any reference to planned or scheduled dates for any activity or milestone. Readers wishing to know planned dates for their own planning purposes are directed to the information provided at the latest EBSIT forum (Reference 2).

This document does not explore the rationale behind the EBS transition strategy for external participants. For a discussion on the transition of MPs in particular, readers are directed to Reference 3.

# 3 Existing External EDT & EDL Interfaces

This section describes the external EDT and EDL testing and transition phases that are on the critical path for EBS go-live. All of the activity described in this section relates to the unchanged EDT and EDL interfaces.
Section 3.1 describes the testing phases and section 3.2 describes the transition phases.

### 3.1 Testing Phases

More detail of the EBS external EDT and EDL testing is given in reference 6.

### 3.1.1 Type Test with Suppliers

This is a compulsory phase of testing for all Suppliers. No action is required by MPs.
The purpose of these tests is to validate the use of the Supplier software against the new EBS system. The tests mitigate the risk of EBS not interfacing correctly with Supplier software at MP sites.

Type tests need to be performed on every version of supplier EDT and EDL software that will be in use at the time of EBS go-live.
As no changes have been applied to the EDT or EDL interface specification, no changes are anticipated to supplier software. Any issues found in testing are likely to result in defects being raised and fixed against the EBS software. Care will be taken by National Grid to successfully conduct thorough testing internally before Suppliers are asked to participate in type tests.
Existing type tests will be used for functional testing. New tests will be developed and distributed to the Suppliers for non-functional testing. The latter will concentrate mainly on the behaviour of EDT and EDL links during failover of the resilient EBS hardware.
Scheduling of the type tests for Suppliers will be on a first-come first-served basis. Wherever possible, the type testing will be conducted via external communication links that mimic the use of links in production. Where this is not possible, the supplier may conduct the type test at the National Grid Wokingham office.
A certificate will be issued to the supplier for each of their EDT and EDL application versions that pass type testing against EBS. This certification is required to validate the use of that software version for EDT submissions or EDL messaging.

### 3.1.2 Circuit Connectivity Testing

This is a compulsory test phase for all MPs. No action is required by Suppliers except where they are acting in a technical capacity on behalf of MPs to manage the physical links with National Grid.
The purpose of these tests is to verify in a non-invasive manner that each instance of a MP's EDL or EDT system can communicate, using the specified ports and protocols, with each instance of the EBS system that has production or external testing potential. The tests mitigate the risk of any combination of National Grid EBS server and MP client system being unable to communicate successfully.
Existing Cable & Wireless Worldwide (C&WW) Network Access Tests (NATS) will be used as modified to include the additional EBS addresses.
As a prerequisite for these tests, National Grid will publish the appropriate EBS address and DNS details to MPs. National Grid will also ensure that all firewall and ACL changes are applied within their network to allow access from each and every issued MP address range.

#### 3.1.2.1 EDL Circuit Connectivity Testing

MPs will be responsible for ensuring that any changes required to firewalls and ACLs on their network beyond the National Grid EDL router are identified and performed. These changes must permit appropriate access between EBS servers and any production instance of the EDL client. They will also have to be performed on the MP side of all EDL routers (e.g. including backup circuits).
On confirmation of the above access changes for an MP, National Grid will conduct the appropriate EDL circuit connectivity test. This will effectively be an extended NATS (i.e. to test end to end connectivity beyond the National Grid router).
MPs would only be involved if issues are found during the extended NATS. National Grid will notify MPs when these tests are completed successfully.

#### 3.1.2.2 EDT Circuit Connectivity Testing

MPs will be responsible for ensuring that any changes required to firewalls and ACLs on their EDT router(s) and internal network(s) are identified and performed. These changes must permit appropriate access between EBS servers and any production instance of the EDT client. They will have to be performed for all EDT circuits (i.e. including backup circuits).

MPs will be responsible for performing the extended EDT NATS. These must be performed from the MP's EDT server(s) to ensure that end to end connectivity with the new EBS servers can be established. National Grid will be available to support these tests and trouble-shoot any issues.
MPs must notify National Grid when these EDT NATS have been completed successfully.

### 3.1.3 Testing with Trading Points

This is an optional test phase. In practice, only those MPs with a test EDT system that is available to and capable of, connecting to the National Grid test EBS service can participate. The purpose of this test phase is to prove the end to end business process using systems and networks that are as near production as possible. (In the case of the EDT network link it will most probably be the production link). This testing mitigates the risk of the application to application process not working correctly across a distributed network.
National Grid will actively approach those MPs known to have the capability to participate.

## 3.2 Transition phases

The transition phases will not start until all test phases have completed successfully. They are characterised by only involving production architecture and only including changes necessary to enable go-live.
Transition activity will not start until a defined period before go-live – it would be counter-productive to perform some of the activity too early. Therefore, once transition activity starts there is an expectation of a reasonably accurate go-live date.

### 3.2.1 Market Participant Access Validation

The access validation phase is intended to demonstrate that MP EDT and EDL systems can make an application level connection to the production EBS application running on production server(s). This will mitigate three major risks; 1) Firewalls and/or ACLs have been changed since successful circuit connectivity tests. 2) The configuration is not correct within the EBS application to enable connection with the production EDT and EDL MP systems. 3) The EBS system does not behave correctly when all of the EDL connections are simultaneously established or EDT submission connections enabled.

#### 3.2.1.1 EDL Access Validation

The validation of the EDL circuits and connectivity will be performed within the context of an outage to the production EDL service. This would clearly be planned and published in advance to MPs.
During the EDL outage, National Grid will enable the EDL service on EBS thus allowing EBS to connect to EDL clients at MP sites. Application 'muzzling' will ensure that it is impossible for EBS to issue any instructions or receive any data inadvertently submitted.
National Grid will be responsible for the conduct of this validation phase. National Grid will want to capture results and perform a risk assessment based on these. Depending on results, several cycles may be required until a small, acceptable number of understood issues remain.

#### 3.2.1.2 EDT Access Validation

Validation of the EDT circuits to EBS does not require an outage to BM EDT. It can be performed without the necessity to interrupt the capability to submit commercial data to BM. Because EDT is essentially all about MPs submitting data, this phase cannot be achieved without their participation. It is most definitely in the interests of MPs to participate. It is their opportunity to confirm that they will be able to directly submit data to EBS post EDT transition without any remedial action.
Sometime before the validation phase, National Grid will issue the production EBS EDT FTP login credentials to MPs. Shortly before the validation starts, National Grid will ensure that the login credentials are reflected in the production EBS configuration.
Validation of the link requires establishing an FTP connection from the MPs production EDT service to the production EBS server(s). This is probably easiest to achieve using a manual FTP connection. However, MPs may elect to re-configure their EDT software temporarily to

make the connection. As this is a potentially sensitive area with a risk of submitting commercial data to the wrong target, the process will be discussed with MPs via the EBSIT forum. Guidelines will be issued before the phase starts and help will be available to talk MPs or their representatives through the activity.
National Grid will proactively capture results and perform a risk assessment based on these. Depending upon results, repeated cycles may be performed but potentially with a reduced participation of MPs (i.e. successful validation would not need to be repeated).

### 3.2.2 Cut-over

#### 3.2.2.1 Preparatory activity

By the time that the EBS cut-over date approaches, National Grid will already have performed a series of prerequisite tasks relating to external parties. All of the address and DNS naming information will have been published and all of the login credentials for EBS EDT will have been sent to MPs (and validated via the phase 3.2.1.2 above). These credentials and the correct configuration for EDL communication will have been loaded into the production EBS server(s). The migration schedule for EDT will have been discussed and issued to MPs. The Transition Communication Plan will also have been issued to interested parties. Any remedial corrective actions required following the validation phases will have also been completed.
Shortly before the planned cut-over date, the date and time will be confirmed with interested parties – including the MPs.

#### 3.2.2.2 EDL Cut-over

No action required is required from MPs for EDL cut-over. When the cut-over to EBS occurs, National Grid will perform the EDL cut-over. This will by necessity be a 'big-bang', totally under the control of National Grid. The only potential involvement of MPs will be if for any unexpected reason one of their EDL stations doesn't connect and end-to-end trouble shooting is required. This is an unlikely event given the mitigation action taken in the validation phases.

#### 3.2.2.3 EDT Cut-over

Once cut-over to EBS is confirmed and a 'Go!' status is communicated to the market, the previously agreed plan for implementing the EDT migration schedule will be initiated. This will require action from MPs or their representatives. At the agreed point in the schedule, the MP will change their EDT client to submit data to the EBS server (via DNS name or address) using the previously validated login credentials. A submission (or re-submission) of production data would be expected to confirm the successful migration. MPs would also have to update any D.R. EDT system to utilise the same addressing and credential information. Should there be any issues with the migration of an individual MP's EDT, an option would exist in the short term to revert to submissions to BM until the problem can be resolved. Support will be available from National Grid staff and their communication network partners during this phase.
For more details of this process, please refer to reference 3.

#### 3.2.2.4 Roll-Back

If after initial running on EBS and after EDL has been cut-over, a roll-back is required to BM, this can be performed entirely by National Grid. The data would still be current on BM and no commercial EDT data submissions will have been lost. The MPs need do nothing – National Grid will arrange for the EDL links to be swung back to BM.
In the very unlikely event of an issue running on EBS after the EDT migration schedule has started, every attempt will be made to 'fix forward' rather than roll-back. If a roll-back is deemed as the only option, National Grid would still be in the position of being able to identify any EDT submissions that might have been made to EBS and take corrective action.

# 4 New External EDT* & EDL* Interfaces

As described above, the implementation of the EDT* and EDL* interfaces will not be until after EBS go-live and are not therefore on the critical path. Implementation is also not entirely in National Grid's control as described below.

## 4.1 Supplier & National Grid Changes

National Grid will provide Suppliers with a generic ABB development toolkit for the EDT* and EDL* interfaces. If Suppliers wish to develop client products for EDT* and/or EDL* it is then down to them to complete their own development and internal testing. National Grid will be conducting their own internal testing of the server end of these interfaces and providing access to a test EBS environment across the internet (via a secure gateway).
After a period of 'informal' testing with National Grid, each supplier will have to arrange a Type Test of their EDT* and EDL* products. National Grid will have produced a new version of the Type Tests for this purpose. After a successful Type Test a certificate will be issued for the Supplier product. This will be an essential prerequisite to using the Supplier product against production EBS.

## 4.2 Market Changes

National Grid will drive the process to agree the change to industry codes via EBSG (Ref 4). They will then agree a timescale for Elexon to deliver the changes required to central systems. Once Elexon have arranged for the code changes and testing to be completed by their development partners, there will be a period of testing between National Grid and Elexon. Initially this will just be a series of 'off-line' tests processing the newly formatted BMRA files and will extend to end-to-end tests across the external network.
Testing will culminate in extended end to end testing with submissions from participants to EBS, from National Grid to Elexon (Central Systems) and Elexon to the wider market via reports and Tibco messaging.
Elexon will implement the changes to Central Systems via one of their thrice yearly release slots. National Grid will arrange to synchronise any corresponding change to the EBS server software as appropriate.

## 4.3 Implementation for Market Participants

For any MP to implement either the EDL* or EDT* versions the following prerequisite activity is essential;

- The Supplier software being used has been certified for use against EBS
- Changes have been implemented at Central Systems to reflect the new data structures
- National Grid have confirmed that the EBS server(s) are ready to receive submissions or exchange messaging with the new interface format

## Appendix A: Document Information

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