

Integral Equipment Testing (IET) Process with NESO (NAP and ENCC)

Version Control

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Introduction

This document aims to outline the process for a user to request an IET as part of the user compliance process or for post-connection testing. The following steps should be adhered to which results in an electricity Network Access Management System (eNAMS – the Outage Planning database) booking that can be quoted on the day of testing to the Electricity National Control Centre (ENCC).

Guidance has also been provided below for submitting Balancing Mechanism (BM) data during IET tests, which are an essential part of the compliance process prior to full participation in the BM. NESO acknowledges that during these tests, where the Balancing Mechanism Unit (BMU) is not fully commissioned, there is anecdotally a lack of clarity around the obligations on customers in respect of their BM data submissions. This guidance document seeks to address that gap to ensure customers can discharge their compliance obligations through successful completion of the IET schedule, whilst ensuring the ENCC has full visibility of the planned and actual output of the BMUs, thus mitigating any risk to the safe, secure and efficient operation of the power system.

For the avoidance of doubt, this is a supporting document and in the event of any ambiguity the industry codes will always take precedent.

Full Process Overview

Grid Code section OC7.5 'Procedure in Relation to Integral Equipment Tests' applies here.

1. IETs must be formally notified in advance to NESO as per Grid Code OC7.5.4 with specific test information. Parties are requested to notify NESO 28 days in advance of an IET to allow sufficient time to process, consider and respond to the request. **Appendix 1** contains an IET proforma that should be used to capture all test requirements.

This request should be sent to the following email addresses based on the location of the generator:

- **England & Wales (E&W):** tranreq@neso.energy
 - **Scotland:** trscotland@neso.energy
2. This will then be acknowledged by the Network Access Planning (NAP) team within NESO who will then forward the details to various NESO stakeholders to ensure compliance and assess any issues. Once any feedback is received, this will be relayed onto the user for further input as necessary. An eNAMS booking will be created as a placeholder by NESO.
 3. The IET will be assessed by the planning team to understand the system impact. They will also inform any relevant impacted parties on the network and seek agreement.
 4. Once all parties are aware and accepting of the IET, NESO will officially confirm the acceptance of the test for the window requested to the user. An eNAMS number will be provided which references the test booking on the system. Telephone numbers for the day ahead desk and the ENCC desk will be provided in the confirmation.
 5. On the day ahead of the planned test, the day ahead desk should be called to notify of the intention to perform the tests providing the eNAMS booking. They will confirm of any issues seen on the network as relevant.
 6. On the day of the test, the NESO ENCC should be called quoting the eNAMS booking prior to taking the test, and they will approve it based on the current network conditions*. After completing the tests, the ENCC should be called again to notify.

*IET acceptance by Network Access Planning is conditional on system conditions being acceptable on the day of the test by NESO ENCC. Adverse weather conditions, network faults or emergency conditions could affect an IET request.

NESO Contact Details

All relevant telephone numbers for NAP and ENCC will be provided once you begin the formal IET process.

BM data submissions during Integral Equipment Tests (IET)

The specific IET schedule will be provided by the NESO generator compliance team but can broadly be broken down into the following areas:

- Reactive capability tests
- Voltage control tests
- Frequency control tests

These three areas can be broken down further into two discrete categories with differing impacts to the NESO control room; and which each require a different approach to BM data submissions. This is described in more detail below.

- **Category 1** – tests that involve a sustained active power output (MW import or export) of over 2 minutes (excluding ramps).
- **Category 2** – tests that involve only a short duration change of active power output (MW import or export) of 2 minutes or less (excluding ramps).

Note that category 1 and 2 as described above are not formally defined terms and have been used solely to provide clarity in this guidance document.

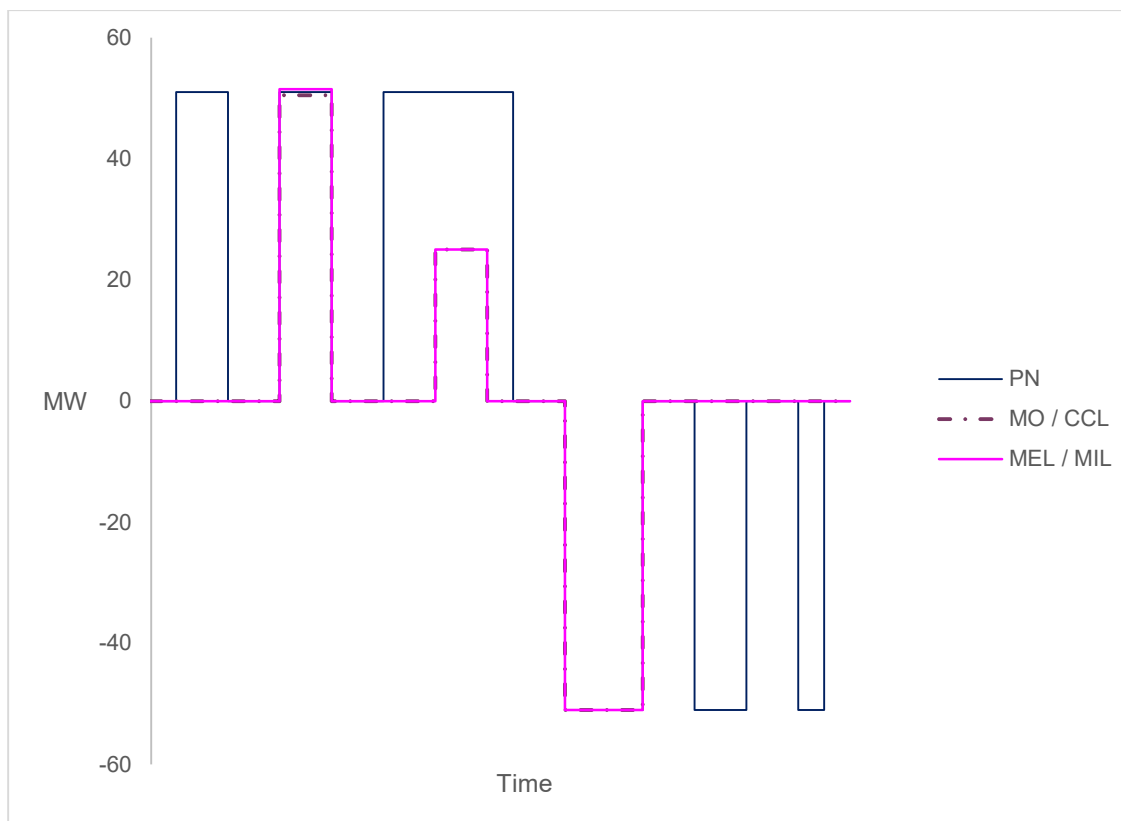
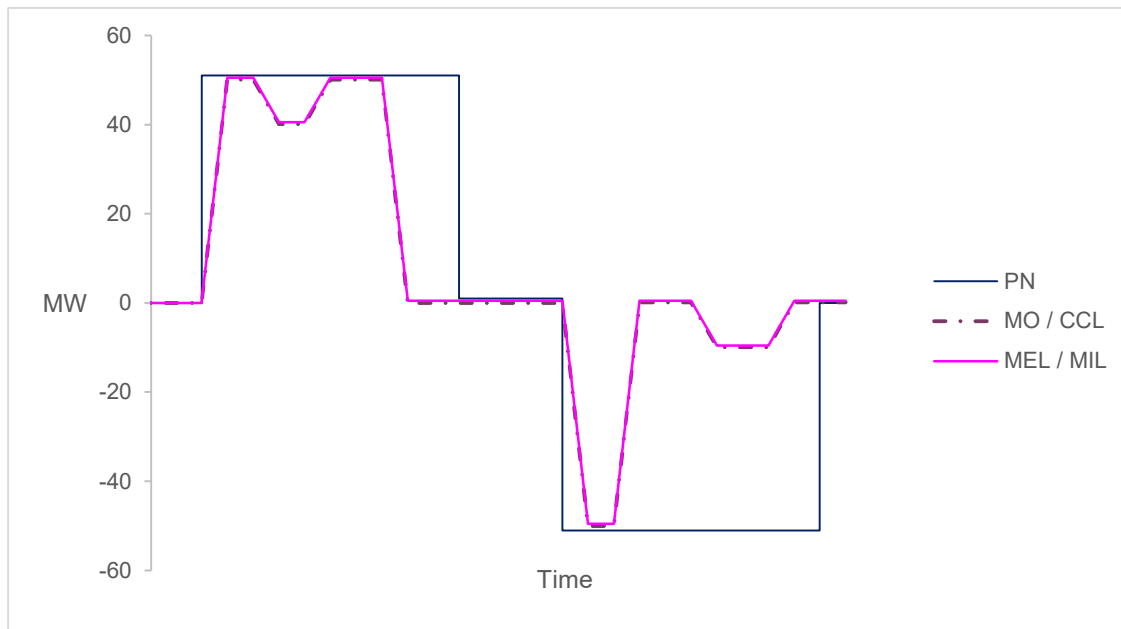
Category 1 BM data submissions

Physical Notification (PN) data can only be submitted or updated pre-gate closure, whilst MEL/MIL are dynamic parameters that can be re-declared or updated post-gate closure.

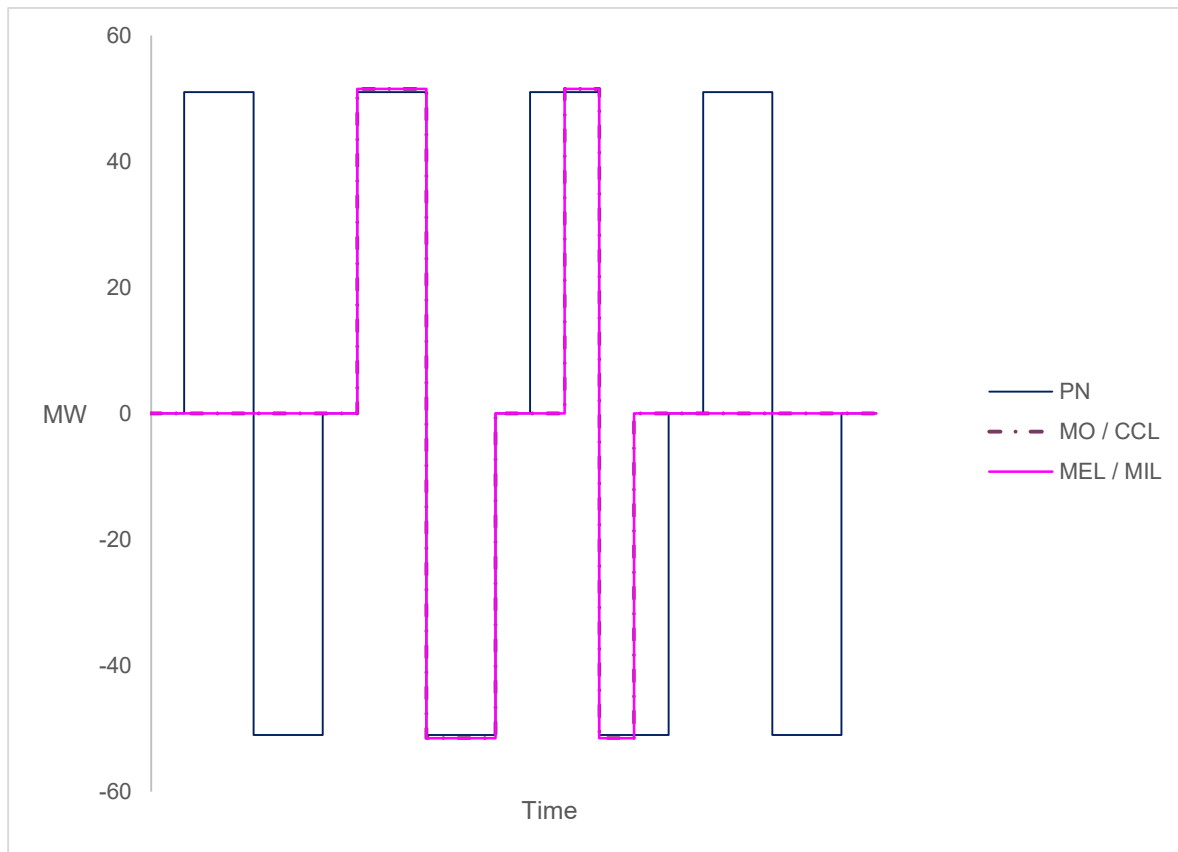
For category 1 tests, block PNs should be used to best represent the planned MW output for a specific time period. This should be submitted pre-gate closure, whilst ensuring the MEL/MIL accurately reflect the initial plans for the testing schedule (i.e. at this stage the MEL/MIL would not be expected to cap the PN profile and will show the full envelope for which the BMU can operate during the test).

As the test begins, the MEL/MIL should be updated post gate-closure to reflect the actual MW output. This approach results in the ENCC having visibility of the BMUs expected metered output via a profile called Capped Committed Level (CCL) which accurately represents the BMUs output. The CCL profile is defined as PN profile, adjusted by any Bid-Offer Acceptances (BOAs) and capped by MEL/MIL. Given the BMU is testing and therefore unlikely to be in receipt of any BOAs (see section below on Bid Offer Pricing), this essentially means CCL equals PN capped by MEL/MIL.

Several examples are provided below with differing degrees of PN granularity and in all cases, it has been assumed that Metered Output (MO) accurately follows CCL, as per the best practice described in this guidance document. In some of the examples, several PN profiles have been submitted, to provide flexibility in the actual delivery of the test (i.e. provides multiple opportunities to deliver the test with a suitable time gap in-between each opportunity to account for potential issues or delays), with the MEL/MIL being used to accurately reflect the MW output throughout.



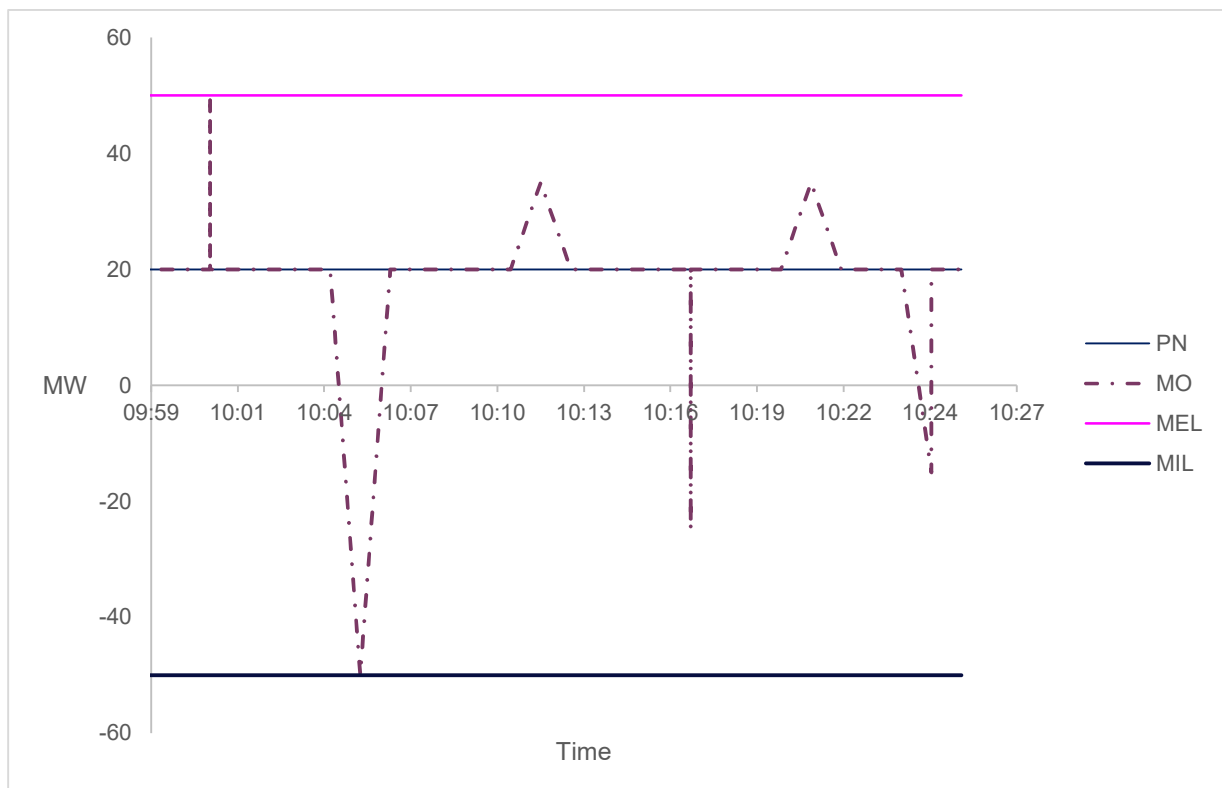
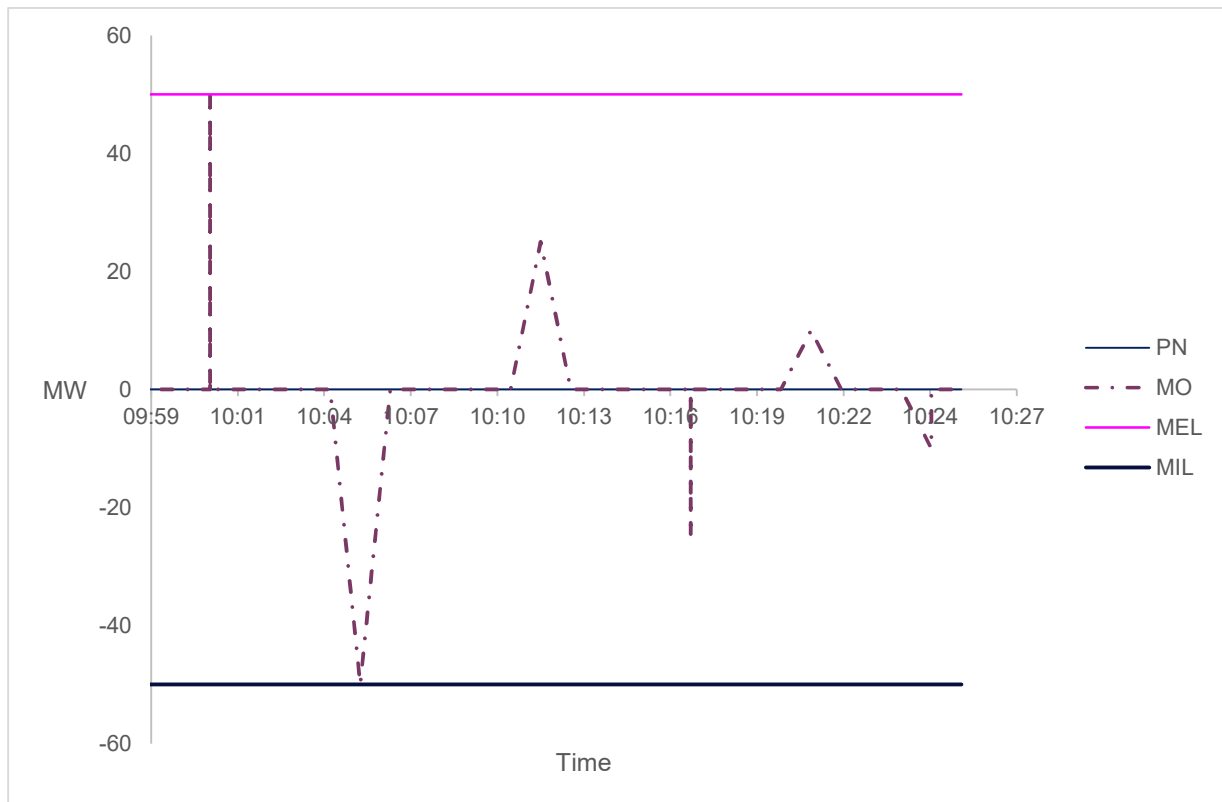
The example below is only applicable for bidirectional BMUs wishing to reflect a PN change from export to import, or vice versa, assuming this is required for their test schedule.



Category 2 BM data submissions

PN data can only be submitted or updated pre-gate closure, whilst MEL/MIL are dynamic parameters that can be re-declared or updated post-gate closure.

For category 2 tests, the use of block PNs is not suitable given the short periods of time in which active power output is expected. In these tests, the PN will generally be zero (as this is the likely starting point of the test) but may be some other static non-zero figure. The MEL/MIL should reflect the potential envelope of the test schedule (i.e. MEL should reflect the maximum expected MW export, and the MIL should reflect the maximum expected MW import, during the test schedule). The execution of each category 2 test is through direct liaison with the ENCC to agree the specific appropriate time to mitigate any potential detrimental impact to system operations. In these cases, we don't use the CCL profile but instead manually account for the expected change in MW output through the liaison described. Two examples are provided below.



Bid-Offer Pricing

For the test categories referenced in this guidance document, it would be advisable to submit bid & offer price data to reflect that the unit is testing and therefore not commercially available to avoid the ENCC issuing BOAs that might disrupt the testing programme. It is entirely the decision of the BMU owner as to what values should be submitted for bid & offer prices.

Communication with the ENCC

IET testing schedules are typically approved such that only one test schedule can occur at any given time. This is to ensure that the ENCC can support the customer with these tests, if required, without creating unmanageable additional workload for the control engineers who are ultimately responsible for safe, secure and efficient operation of the GB power system.

At the start of the testing schedule, the customer should contact the ENCC to advise of the testing and briefly discuss the plan for that day. During that discussion, the ENCC control engineer will outline the expected level of ongoing communication for the day, which will depend on factors such as category of testing (see above); the magnitude of active power output change(s); and system conditions on the day. Note this is not an exhaustive list and is for guidance only.

Diligent communication, in parallel with ensuring accurate BMU data submissions, is essential for the safe, secure and efficient operation of the GB power system.

The ENCC contact numbers for the Transmission and Energy teams are provided above.

The Transmission team should be contacted before starting any IETs that result in a planned change in reactive power. The Energy team should be contacted before starting any IETs that result in a planned change in active power. Therefore, depending on the test schedule, both may need to be contacted.

Supplementary Notes

Any commercial implications associated with the submissions of PNs, and/or the actual active power output of the BMU (e.g. imbalance charges), is the responsibility of the BMU owner and thus for them to consider.

Glossary

Acronym	Definition
BESS	Battery Energy Storage Systems
BM	Balancing Mechanism
BMU	Balancing Mechanism Unit
BOA	Bid Offer Acceptance
CCL	Capped Committed Level
eNAMS	electricity Network Access Management System
ENCC	Electricity National Control Centre
IET	Integral Equipment Test
MEL	Maximum Export Limit
MIL	Maximum Import Limit
MO	Metered Output
MW	Megawatt
NAP	Network Access Planning
NESO	National Energy System Operator
PN	Physical Notification

Appendix 1: IET Proforma

IET Notification Template		
To	National Energy System Operator	Document version 1
From	Company Name	IET Submission Date DD/MM/YYYY
Plant	Plant Name	
Registered Capacity	Registered Capacity in MW	
Connection Point	Transmission Owner Substation Name/Location (Specifying connection point)	
Test window and expected test date:		
Test: DD/MM/YYYY: From 10:00 to 13:00		
Risk of Trip	Y/N	
MW change	Amount of MW change during Testing	
MVAR change	Amount of MVAR change during Testing	
Voltage Impact	Y/N	
Type of Test, Description / Reason for Test, Witnessed or non-Witnessed		
What is being proven?		
Details of the direction of flow during the test avoiding the words 'exporting' and 'importing'.		
Description of Test(s)		
<ul style="list-style-type: none"> • True MW value of the test (taking account of any loss factors) • Duration of the test • Detailed date and time of the test • All ramp rates (step or ramp) • Planned MW swings • Planned monopole or bi-pole trips • Planned frequency response testing • Any additional information 		
On-site Personnel		
Name	Mobile Number	Role
Example: John Smith	+44 xxxxxxxxx	Test Co-ordinator
Example: Sarah Smith	+44 xxxxxxxxx	Client Engineer
Test procedure/schedule		A copy of the test procedure/schedule to be shared upon submission (please include diagrams where possible)
Confirmation the test programme can be shared with the TO and/or DNO (if an embedded user)		Y/N