FREQUENCY RESPONSE MONITORING

(ANCILLARY SERVICES BUSINESS MONITORING)

This document is for Relevant Electrical Standards document only.

PURPOSE AND SCOPE

This document describes the technical requirements for User's equipment directly or indirectly connected to the National Electricity Transmission System who are contracted to provide Ancillary Services (i.e. Frequency Response) pursuant to the terms of the Bilateral Connection Agreement.

This document details the functional and performance requirements for Ancillary Services Business Monitoring (ASBMON).

Equipment topologies other than those proposed in this specification are acceptable where such solutions can be demonstrated by the supplier to meet the overall functional and performance requirement specified herein.

PART 1 – PROCEDURAL

1 FUNCTIONAL AND PERFORMANCE REQUIREMENTS

1.1 General

1.1.1 ASBMON is the current system used to collect data from generators selected by the Electricity National Control Centre (ENCC) for frequency response to determine their performance against their contract for frequency response provision.

1.1.2 Access to system data, parameter settings and the configuration of equipment shall be via a secure network connection

1.1.3 ASBMON system shall comprise:

a) A data acquisition unit.

b) Data storage

1.1.4 The Data Acquisition Units shall have at least 1 x Ethernet ports, 1 x internal 56K modem, 1 x Generator Response Data Output (GRDO) RS232 port, and 1 x USB port

The USB port or a second Ethernet port shall be utilised to update the firmware locally and provide access to system configuration locally.

1.2 Inputs

1.2.1 The following inputs shall be provided as a minimum.

- 1 x GRDO RS232 port (if signal is derived from OMS)

- 3 x analogue current (if input is derived directly from Instrument Transformers)
- 3 x Analogue voltage (if input is derived directly from Instrument Transformers)

1.3 Time Keeping

1.3.1 Time keeping shall be derived from the Operation Metering Summator or Network Timing Protocol via Ethernet.

1.4 Continuous Time Series Data

1.4.1 All data acquired by the Data Acquisition Unit shall be continuously stored.

1.4.2 The storage rate shall be capable of at least 1 sample per second, with an overall accuracy of +/- 0.5 seconds if derived from OMS, or 2 samples per second with an overall accuracy of +/- 1% if derived from transformer HV Instrument Transformers.

1.4.3 Non-volatile static memory shall be provided for storage of a minimum of 28 days data, prior to overwriting on a first in first out basis.

Informative: Overall accuracy refers to the accuracy of the ASBMON unit, not the overall system accuracy.

1.5 Parameters to be measured as Continuous Time Series Data

1.5.1 System Frequency

- This shall be derived from the GRDO if using OMS inputs, or number of cycles if using analogue input.

1.5.2 Active Power

- The accuracy of all power values shall be +/- 2.5% or better.

1.5.3 Reactive Power

- The accuracy of all power values shall be +/- 2.5% or better.

1.6 Parameters to be recorded “on change” with time stamp in real time or as Continuous Time Series Data

1.6.1 Status signal for Frequency Sensitive Mode “ON” or “OFF”

1.6.2 Scheduled Active Power Output

1.6.3 Parameter settings for active power frequency response including droop and deadband.

2 DATA & USER REQUIREMENTS

2.1 Software and Firmware

2.1.1 ASBMON firmware shall be available to NG free of charge and on an as required basis to enable upgrade activities.

2.2 Client User Interface

2.2.1 Informative: *The normal mode of operation will be for NGET engineers to have direct access to data for viewing and analysis~~,~~ via a web browser interface.*

2.2.2 The data required for display shall be selectable from any Data Acquisition Unit on the system.

2.2.3 All data selected for display shall be clearly identified by its source.

2.2.4 The units of time shall be appropriate to the period selected for display.

2.2.5 Export of data should be in a range of common formats such as .CSV, .XLS, .MDB

2.3 Communication Architecture

2.3.1 Each Data Acquisition shall have the capability to independently sense, acquire and store data and then to transfer the data via a LAN to the master substation server

2.3.2 If data is stored on a central server, the central server shall collect all the data from the remote Data Acquisition Units on a pre-determined regular interval, with the option to access the data on request.

2.3.3 The data should then be accessible to NGET by web browser.

3 HARDWARE PLATFORMS

The following applies to all hardware items, as appropriate to the equipment item.

3.1.1 Hardware platforms used within a substation environment shall comply with the requirements of TS 3.24.15 (RES).

3.1.2 The following Status Outputs shall be provided

a) Equipment healthy.

b) Out of service mode.

3.2 CT and VT Inputs

3.2.1 The nominal value of CT inputs (In) shall be 1 amp.

3.2.2 The nominal value of VT inputs (Vn) shall be 110 V / $\sqrt{3}$.

4 CONTRACT SPECIFIED OPTIONS

None.

5 OTHER REQUIREMENTS

5.1.1 The calibration period over which performance requirements are met shall be defined.

6 TEST REQUIREMENTS

6.1 General

6.1.1 The requirements of TS 3.24.15 (RES) shall apply. For the purposes of electrical environmental tests all equipment shall be classified as “substation equipment”.

6.1.2 During and after all environmental tests, all equipment shall meet with the requirements of this specification. No additional derogation is given for influence quantities.

6.1.3 Performance requirements are inclusive of the effects of all external accessories e.g. current shunts and current transformers.

6.1.4 All equipment shall be CE marked, suited for application in an industrial environment

7 FORMS AND RECORDS

Not applicable

PART 2 - DEFINITIONS AND DOCUMENT HISTORY

8 DEFINITIONS

CT	Current Transformer
DAU	Data Acquisition Unit
GPS	Global Positioning System
LAN	Local Area Network
Vn	Nominal input voltage
In	Nominal input current
VT	Voltage Transformer

9 AMENDMENTS RECORD

Issue	Date	Summary of Changes / Reasons	Author(s)	Approved By (Inc. Job Title)
1	October 2014	First Issue	Richard Poole	GCRP
2	February 2018	Alignment with EU codes	Thomas Charton	GCRP

9.1 Procedure Review Date

5 years from publication date.

PART 3 - GUIDANCE NOTES AND APPENDICES

10 REFERENCES

10.1 National/International Standards

IEC 61000 Electromagnetic Compatibility

10.2 National Grid Documents

TS 3.24.15 (RES)	Environmental and test requirements for the hardware units
TS 3.02.04 (RES)	Current Transformers for Protection and General Use