Issue 93 Digital Meeting Etiquette

- Welcome to the Issue 93 Workgroup meeting 7 – we'll start shortly
- No video please to conserve bandwidth
- Please stay on mute unless you need to talk – use IM if you can't break through
- Talk – pause – talk
- Lots of us are working remotely – be mindful of background noise and connection speeds

ELEXON

Issue 93 - Metering Code of Practice Review

Meeting 7

Monday 21 March 2022

Meeting Agenda

Agenda Item	Lead
1. Welcome and Meeting objectives	Iain Nicoll (Chair)
2. Update on Actions	Stanley Dikeocha (Lead Analyst)
3. Update and recommendation on all reviewed aspects	Iain Nicoll (Chair)
5. A_14 Requirement to provide SLDs for HV and EHV sites	Elexon Metering Team
4. AOB Items	Iain Nicoll (Chair)
5. Next steps & Meeting close	Stanley Dikeocha (Lead Analyst)

Meeting Objectives

Objectives for this meeting:

- Confirm decision on previously discussed aspects
- Confirm capacity for the proposed subgroup session to discuss Aspect 3 and 13
- Update the Work group on the timeline for the remaining aspects

ACTION UPDATE

ELEXON

Action Update

Owner	Action description	Captured from	Update
Elexon	Confirm if the solution from the CoP Consolidation Aspect will be progressed via a Modification	Workgroup 6 – CoP Threshold Table	We spoke to our Legal team and confirmed that a Modification won't be required.
Elexon	Confirm the cost difference between Class 1 and 0.5s active Meters, in terms of the volume	Workgroup 6 – CoP Threshold Table	We received one response from Honeywell. The feedback received suggests a 10% to 15% cost difference (with increased volumes)
Elexon	Speak to CVA and SVA MOAs to retrieve calibration testing data and confirm if Calibration checks were performed on R/W Prometer Meter types respectively	Workgroup 6 – Calibration for Main and Check Meters	We have sent an email to SVA and CVA MOAs
Elexon	Check the relevant IEC standards and confirm if there is a requirement on the resolution of energy	Workgroup 6 – MWh vs kWh	We have completed this. Response to be presented alongside the "MWh vs kWh" slide
Elexon	Retrieve test reports from VT and CT manufacturers, which demonstrates accuracy versus burden/rated current	Appropriate CT ratio and minimum burden	We have sent two emails (28 February and 14 March) to some VT and CT manufacturers.
Elexon	Contact BSI and confirm why the IEC standards specify the cut-off at 25% of rated burden and at 1VA	Appropriate CT ratio and minimum burden	We received a response from BSI, explaining their rationale.

ASPECT UPDATE

ELEXON

Aspect Update – CP raised or in progress

Aspect number	Description	Progress	Status
A_09	Tightening the minimum accuracy classes for Meters (CoP5) and CTs (CoPs 3, 5 and 10)	CP1553 raised to address the issue. To be implemented in the June 2022 standard BSC Release.	Closed (CP pending implementation)
A_12	Future proofing changes to the IEC standards	CP1554 raised to address the Issue. To be implemented in the June 2022 standard BSC Release.	Closed (CP pending implementation)
A_15	Monitoring of Voltage failure alarms	CP1550 raised to address the issue in this aspect. To be implemented in the June 2022 standard BSC Release.	Closed (CP pending implementation)
A_11	Determining the relevant CoP for embedded circuits	The issue in this aspect is being addressed in the new CP which seeks to introduce a requirement in the AMP vs DMP scenario	In progress
A_07	Consideration of DMP vs AMP	- New CP being progressed to effect changes in Option 1 and 3 - Options 2 and 4 will be progressed via a Modification	In progress

Aspect Update – in progress, no CPs or Mods recommended

Aspect number	Description	Progress	Status
A_06	MWh vs kWh	Data flow and system requirements for decimal places confirmed. Meter standard requirement confirmed. Elexon to confirm the Issue Group's decision on this aspect.	Considered by the Issue Group
A_08	Measuring elements on neutral and earth conductors	Use text from 5.3 'Meters' in 5.1 'Measurement Transformers' and provide guidance on neutral and earth conductors. Remove neutral and/or earth conductors sentence in 5.3.	Considered by the Issue Group
A_05	De-energised circuits	We are checking with LDSOs if voltage connections can be connected to the incoming side of the switchgear.	Considered by the Issue Group
A_04	Calibration checks for Main and Check Meters	The progression of this aspect is subject to the data we receive from SVA and CVA MOAs regarding the test report.	Considered by the Issue Group
A_01	Consolidation of the CoPs	We have confirmed that a Modification won't be required to progress this.	Considered by the Issue Group
A_04	Calibration checks for Main and Check Meters	We are progressing some key actions that will determine our recommendation on this aspect.	Considered by the Issue Group

Aspect Update – in progress, no CPs or Mods recommended

Aspect number	Description	Progress	Status
A_10	Reactive only sites	The conclusion from Workgroup 4 was that a statement should be added to the relevant CoP to guide customers on what to do when they operate outside of the Overall Accuracy points for %1r, and at low power factors.	Considered by the Issue Group
A_17	Minimum burden requirements and CT ratio vs circuit/agreed capacity	The WG concluded that an appropriate CT ratio is used to ensure accuracy. Low burdens may not present an issue to accuracy if the appropriate CT ratio is specified. Waiting for manufacturer responses (test certificates).	Considered by the Issue Group

Aspect Update – Not considered by the Issue group

Aspect number	Description	Progress	Status
A_02	HH vs NHH requirements	To be considered in Workgroup 8 [May]	Not started
A_03	Duplicate communications paths for Metering Equipment within CoPs 1 and 2	Subgroup to be held in April to discuss this aspect	Not started
A_13	Security of using public IP addresses for Communications to Metering Systems	Subgroup to be held in April to discuss this aspect	Not started
A_16	Obsolete Metering Equipment	To be considered in Workgroup 8 [May]	Not started
A_18	Clarify DMP for LV supplies	To be considered in Workgroup 9 [June]	Not Started

RECOMMENDATIONS ON REVIEWED ASPECTS

ASPECT 6
‘MWH VS KWH’

ELEXON

Recommendation – MWh vs kWh

- At Workgroup meeting 6, Elexon explained the background of this issue, outlining the scenarios for CVA and SVA granularity of data

- Elexon's view was that the even though the use of "MWh" and "kWh" was inconsistent across CVA and SVA Metering systems, it is not intended to be consistent
  - Elexon further noted that the current specifications as seen in CoPs 1, 2, 3, 5 and 10 were appropriate, given the difference in quantity of energy measured (generally) between CVA and SVA sites

- A member from the WG asked for clarity on the granularity of data that is being recorded, to which Elexon took an action to check the requirements in the relevant IEC standards and the requirements guiding the resolution of energy

- We extracted from IEC standard 62052-11:
  - 5.6 Display of measured values
    - 5.6.1 General

    These requirements are applicable to meters with or without indicating displays. The principal unit for the measured values shall be the watt-hour (Wh), var-hour (varh), voltampere-hour (VAh), kilowatt-hour (kWh), kilovar-hour (kvarh), kilovolt-ampere-hour (kVAh) or the megawatt-hour (MWh), megavar-hour (Mvarh), megavolt-ampere-hour (MVAh).

  - 7.2 Methods of accuracy verification

  For testing purposes, the energy registers of the electricity meter shall have a resolution sufficient to observe the critical change value.

Recommendation – MWh vs kWh

- We extracted from IEC standard 62052-11:
  - 3.6.3 - **critical change value**

maximum amount of change allowed in the meter's energy registers during disturbance tests without any current flowing in the meter's current circuits.

The critical change value (x) is derived from the following formula:

$$X = 10{-}6 \times m \times Un \times Imax$$

Where x is the critical change value, in kWh or kvarh;
m is the number of measuring elements;
Un is the nominal voltage, in volts;
Imax is the maximum current, in amperes.

- They have an example in a note in 9.3.1.2.3:

NOTE 2 For example, a polyphase meter, with 3x230/400 V and 100 A maximum current, has a critical change value of 3x230x100x10e-6 = 0,069 kWh

- Question to the Workgroup:
  - Is this still an issue that needs to be resolved?

ASPECT 8 ‘MEASURING ELEMENTS AND NEUTRAL CONDUCTORS’

ELEXON

Summary/Recommendation – Measuring elements and neutral conductors

- Elexon highlighted the standing issue in this aspect to the Subgroup members at the meeting on Friday 5 November
  - Ambiguity in the wording currently in Section 5.3 ‘Meters’ of the CoPs, noting the missing criteria for 5.1 ‘Measurement Transformers’
- The conclusion was that Elexon will update the redlining to provide more clarity in the CoPs. These incudes:
  - Deleting this sentence ***“These include the neutral conductor, and/or the earth conductor where system configurations enable the flow of zero sequence energy”*** from Section 5.3; and
  - An explanation of the application of neutral and earth conductors will be introduced in Section 5.1 ‘Measurement Transformers’ of the CoPs
- We have an outstanding action to contact Siemens and understand the “Harmonics” and “zero sequence energy” situation

ASPECT 5 ‘DE-ENERGISED CIRCUITS’

ELEXON

Summary/Recommendation – De-energised circuits

- This aspect was discussed at the fifth Workgroup session, where Elexon explained the background and presented four options:

  - **Option 1 - Connection of the Metering Equipment to the incoming side of the main switchgear so that it is normally energised even when the switchgear is open**;
  - Option 2 - The Installation of Separate Meters and Outstations to facilitate local and remote interrogation. However, the Meters would need to have a permanent Meter register to meet the requirements of clause 5.3 (of CoPs 3 and 5);
  - Option 3 - Utilising integrated products which have separate input terminals to energise the data storage and display functions which could be connected to a normally energised supply, whilst the voltage supply to the Meter is from the relevant circuit; and
  - Option 4 - Connecting the integrated equipment to an appropriate single-phase voltage supply. This option is only suitable for use with CT operated Metering Systems

- The Workgroup concluded that Option 1 was the most feasible and logical. However, the practicalities must be confirmed before any further suggestions can be made

- Elexon took an action to confirm the practicalities of option 1 with the LDSOs. We are still speaking with LDSOs

NEW ASPECT

ELEXON

ASPECT 14 ‘REQUIREMENT TO PROVIDE SLDS FOR HV AND EHV SITES’

ELEXON

A_14 Requirement to provide SLDs for HV and EHV sites

- P391 introduced the concept of Desktop Audits for the Technical Assurance Audit (TAA) in February 2020.
- As part of the process for Desktop Audits LDSOs were required to submit Single Line Diagrams (SLD) for each Metering System being audited.
- A challenge was presented that there was no requirement within the BSC to produce a SLD and so the requirement to submit one for an audit was inappropriate. It was also highlighted that industry participants did not feel that providing an SLD for LV Metering Systems added value.
- As a result of the challenges, the requirement to provide an SLD as part of a Desktop Audit was postponed until such time that a corresponding requirement to create one was introduced into the CoPs. This requirement will only apply to HV and EHV Metering Systems.
- P375 (via the implementation of CoP11) and REC CP R0018 are both proposing to add a definition of SLD to their respective codes. The definition is as follows:
  - ***Single Line Diagram (SLD)*** *- means a simplified notation for representing a three-phase power system that must show the locations of all circuits and the Metering Equipment associated with a Site.*
- We propose to use the same definition in the Codes of Practice.

ELEXON

A_14 Requirement to provide SLDs for HV and EHV sites

- The current guidance for the submission of SLDs for the Desktop Audit states

The single line diagram (SLD) should include all circuits registered under the MSID. Where the SLD provided indicates a mismatch between either: the number of circuits provided by the Registrant or the number of circuits provided by ELEXON (CVA only), the TAA should raise an A.14X non-compliance.

The SLD should also show that all Metering Equipment comprised within the Metering System should be located at the Defined Metering Point (DMP), as defined in Appendix A of the relevant CoP. Where the SLD shows the Actual Metering Point (AMP) to be different from that of the DMP (and the Supplier did not indicate that the MSID was subject to a Metering Dispensation in their commitment questions) then the TAA should raise a A.2X and an A.2R non-compliance with a comment in the additional notes section detailing "AMP not at DMP – potential Metering Dispensation required".

In addition to the SLD a more detailed diagram can be provided that shows the Measurement Transformer connections so long as the diagram includes enough detail to determine the physical location of the Meter Point in relation to the Total System.

The SLD should provide the ratio of all measurement transformers comprised within the Metering System where possible. Where the ratio provided on the SLD does not match with any other item of evidence provided by any other party then an A.4R non-compliance should be raised. Another A.4 non-compliance should be raised against the party responsible for providing the item(s) of evidence on which the mismatch occurred.

Where a SLD has not been provided then a B.3R non-compliance should be raised.

A_14 Requirement to provide SLDs for HV and EHV sites

Question for the Workgroup:

- Does the Workgroup agree with the proposal to add a requirement into the CoPs (1, 2, 3 and 5) that an SLD must be created and auditable for each HV and EHV Metering System?
- Does the Workgroup agree that this requirement should not apply to LV Metering Systems?
- Is the Workgroup comfortable with the CoPs using the same definition that is to be implemented under P375 and R0018?
- Does the Workgroup have any comments on the current TAA guidance in relation to what should be included within the SLD?

AOB ITEMS AND NEXT STEPS

AOB ITEMS

ELEXON

AOB Items

- Update on new CPs
  - ‘Mandating the number of outstation channels for SVA sites’ – Recommendation from Issue 80
  - Updating the distance requirements between AMPs and DMPs, subject to overall accuracy limits
    - Addressing A_07 ‘Consideration of DMP vs AMP’ and A_11 ‘Determining the relevant CoP for embedded circuits’

- Subgroup meeting to discuss A_03 ‘Duplicate communications paths for Metering Equipment within CoPs 1 and 2’ and A_13 ‘Security of using public IP addresses for Communications to Metering Systems’
  - W/C 25th April 2022

NEXT STEPS

ELEXON

Next steps

- Book the subgroup to discuss Aspect 03 ‘Duplicate communications paths for Metering Equipment within CoPs 1 and 2’
  - W/C 25th of April

- Arrange the seventh Workgroup session
  - W/C 16th or 23rd of May

MEETING CLOSE

ELEXON

THANK YOU

Stanley Dikeocha

stanley.dikeocha@elexon.co.uk

bsc.change@elexon.co.uk

Monday 21 March 2022