ELEXON

Issue Report

Issue 93 “Review of the BSC metering Codes of Practice”

Contents

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About This Document

Not sure where to start? We suggest reading the following sections:

- Have 5 mins? Read sections 1
- Have 15 mins? Read sections 1 and 6
- Have 45 mins? Read all sections
- Have longer? Read all sections and the annexes and attachments
- *You can find the definitions of the terms and acronyms used in this document in the BSC Glossary*

This document is the Issue 93 Group’s Report to the BSC Panel. Elexon will table this report at the Panel’s meeting on 8 September 2022.

There are three parts to this document:

- This is the main document. It provides details of the Issue Group’s discussions and proposed solutions to the highlighted issues, progression plan (see appendix 2) for the aspects that have not had their solutions implemented, and contains details of the Workgroup’s membership.
- Attachment A contains the Issue 93 Proposal form.
- Attachment B contains the Issue 93 attendance.

Issue Report

1. Summary

The Association of Meter Operators (AMO)[1] raised Issue 93 on 15 January 2021 to review the metering Codes of Practice (CoPs), which have never been reviewed in totality before.

The main aim of the review was to improve the CoPs, and where appropriate, remove existing perceived ambiguities and obsolete processes and technology.

The Group considered 18 issues, which the Group referred to as Aspects, over 12 meetings, resulting in 13 Change Proposals (CPs) and one Modification being recommended. Of these 14 changes, three CPs have been raised/implemented and the remaining have been scheduled to be raised over the next 12 months. This includes removing four redundant CoPs and consolidating the remaining ones (except CoP 4) to simplify the arrangements.

What is the Issue?

The metering Codes of Practice (CoPs)[2] detail the technical requirements for Metering Systems used for Settlement purposes. When Metering Equipment is first registered in Settlement, it must comply with the requirements that are set out in the relevant CoP, applicable at the time of registration.

The CoPs, since they were implemented under the New Electricity Trading Arrangements (NETA) in 2001, have not been reviewed in entirety. Since then, the electricity market has evolved, introducing new technology and the metering rules and regulations have evolved within and outside of the BSC. As a consequence, some elements of the CoPs are ambiguous and can be interpreted differently by the relevant Parties and Party Agents using the documents.

Issue 93 was raised initially with thirteen specific Aspects[3] to consider. Further conversations in the first and second Workgroup meetings led to the addition of five new Aspects, making it a total of eighteen Aspects considered in the Issue 93 review.

The aim of the majority of the Aspects was to aid clarity and remove ambiguity.

Conclusions and Recommendations

The Issue Group collaborated with Elexon through nine main Workgroup meetings and four subgroup meetings to review the Aspects.

Metering Systems

A Metering System means particular commissioned Metering Equipment installed for the purposes of measuring the quantities of Exports and Imports at the Boundary Point.

Metering Equipment

A Metering Equipment means Meters, measurement transformers, metering protection equipment including alarms, circuitry, associated Communications Equipment and Outstation and wiring.

[1] https://meteroperators.org.uk/
[2] https://www.elexon.co.uk/bsc-and-codes/bsc-related-documents/codes-of-practice/
[3] For the purpose of this report, an Aspect is defined as a specific issue/area which was highlighted in the Issue 93 Proposal form and then subsequently expanded by the Issue Group.

The outcome of this collaboration and the review of Issue 93 led to the implementation of **three** BSC Change Proposals (CPs), and the recommendation to raise a further **ten** CPs and **one** Modification after the conclusion of Issue 93.

Furthermore, the Issue Group agreed to close **three** Aspects, with no further action required. The rationale for progressing or closing each Aspect is documented in this Report.

The full list of all Aspects reviewed by the Issue 93 Workgroup can be found below:

Aspect No.	Aspect Description	Outcome
Aspect 01	Consolidation of the CoPs	Progress CP after Issue 93 concludes.
Aspect 02	Half Hourly versus Non-Half Hourly requirements	Closed, no further action required.
Aspect 03	Duplicate Communications paths for Metering Equipment within CoPs 1 and 2	Progress CP after Issue 93 concludes.
Aspect 04	Calibration checks for Main and Check Meters	Progress CP after Issue 93 concludes.
Aspect 05	De-energised circuits	Closed, no further action required.
Aspect 06	Inconsistent use of MWh vs kWh	Closed, no further action required.
Aspect 07	Consideration of DMP vs AMP	Progress Modification after Issue 93 concludes.
Aspect 08	Measuring elements on neutral and earth conductors	Progress CP after Issue 93 concludes.
Aspect 09	Tightening the minimum accuracy classes for CoP5 Meters and CoP 3, 5 and 10 CTs	CP1553 was implemented on 30 June 2022 to make effect the solution for this Aspect.
Aspect 10	Reactive Only Sites (NG)	Progress CP after Issue 93 concludes.
Aspect 11	Determining the relevant CoP for embedded circuits	Combined with Aspect_07 solution, which will be implemented via a modification
Aspect 12	Future proofing changes to IEC Standards	CP1554 was implemented on 30 June 2022 to make effect the solution for this Aspect.
Aspect 13	Security of using public IP addresses for Communications to Metering Systems	Progress CP after Issue 93 concludes.
Aspect 14	Requirement to provide SLDs for HV and EHV sites.	Progress CP after Issue 93 concludes.
Aspect 15	Monitoring of Voltage failure alarms	CP1550 was implemented on 30 June 2022 to make effect the solution for this Aspect.
Aspect 16	Obsolete Metering Equipment	Progress CP after Issue 93 concludes.
Aspect 17	Minimum burden requirement and CT ratio vs circuit/agreed capacity	Progress CP after Issue 93 concludes.
Aspect 18	Clarify DMP for LV supplies	Progress CP after Issue 93 concludes.

2. Background

The CoPs set out the minimum engineering and data requirement that Metering Systems must adhere to in order to be classified as compliant Metering Systems under the Balancing and Settlement Code (BSC). There are various metering CoPs (1, 2, 3, 5, 6, 7 and 10 for Half Hourly (HH) Metering Systems and 8 and 9 for Non-HH (NHH) Metering Systems). CoP4[4] is different as it sets out the minimum requirements for calibrating, testing and commissioning the Metering Equipment installed in Metering Systems under all the other CoPs.

Half Hourly Metering Code of Practice
CoP1 'Code of Practice for the Metering of Circuits with a Rated Capacity Exceeding 100MVA for Settlement'
CoP2 'Code of Practice for the Metering of Circuits with a Rated Capacity not exceeding 100 MVA for Settlement Purposes'
CoP3 'Code of Practice for the Metering of Circuits with a Rated Capacity not Exceeding 10 MVA for Settlement Purposes'
CoP5 'Code of Practice for the Metering of Energy Transfers with Max Demand of up to (and including) 1MW for Settlement Purposes'
CoP6 'Code of Practice for the Metering of Energy Imports via Low Voltage Circuits Fused at 100 AMPS or Less per Phase for Settlement'
CoP7 'Code of Practice for the Metering of Energy Import via Low Voltage Circuits Fused at 100 AMPS or Less per Phase For Settlement'
CoP10 'Code of Practice for the Metering of Energy via Low Voltage Circuits for Settlement Purposes'

Non - Half Hourly Metering Code of Practice
CoP8 'Code of Practice for the Metering of Import Active Energy via Low Voltage Circuits for Non-Half Hourly Settlement Purposes'
CoP9 'Code of Practice for the Metering of Import and Export Active Energy via Low Voltage Circuits for Non-Half Hourly Settlement Purposes'

The CoPs are owned by the Imbalance Settlement Group (ISG) and the Supplier Volume Allocation Group (SVG) and changes to the CoPs must be approved by the ISG and SVG dependent on ownership defined in the BSC Baseline Statement[5]. In October 2020, the ISG and SVG agreed that the CoPs should be reviewed via a BSC Issue and agreed with a draft timetable and approach (SVG236/02[6] and ISG234/01[7]).

The approach included limiting the review to 12 months, with an additional six month contingency to be called upon, if needed, with ISG/SVG approval. This was put in place to control the risk of significant scope creep and a prolonged review. It also included trying to progress any quick wins as the review progressed, rather than waiting for the review to

[4] Code of Practice for the Calibration, Testing and Commissioning Requirements of Metering Equipment for Settlement Purposes
[5] https://www.elexon.co.uk/documents/bsc-codes/bsc-sections/bsc-baseline-statement-2/
[6] https://www.elexon.co.uk/meeting/svg236/
[7] https://www.elexon.co.uk/meeting/isg234/

conclude before raising any changes. Agile ways of working were utilised were possible and appropriate.

The AMO raised Issue 93 in January 2021. The Issue 93 Workgroup was established to discuss the areas mentioned above. They were tasked with prioritising and progressing a number of Aspects (see Appendix 2 – Summary of Aspects for consideration for details).

The review did not include the new CoP 11 'Code of Practice for the Metering of Balancing Services Assets for Settlement Purposes'[8] as this was not in force when the scope of the Issue 93 review was established. CoP11 only came into force in June 2022, when the Issue 93 Review was concluding.

[8] https://bscdocs.elexon.co.uk/codes-of-practice/code-of-practice11-code-of-practice-for-the-metering-of-balancing-services-assets-for-settlement-purposes

3. Issue 93 Progression approach and key events

Applying Agile ways of workging to the Issue 93 review

Issue 93 was the first BSC Issue Group to be conducted using agile ways of working. Historically, BSC Issue Work Groups (WGs) have been run using solely a "Waterfall" approach, which means the review has specific stages with criteria that must be met before beginning the next stage. This also means the recommendations/solution proposed by the WG are not progressed until the closure of the Issue and WG meetings. This can often mean that it can take years before any recommendations are implemented.

For clarity, a "Waterfall" project methodology refers to a sequential process that flows like a waterfall through all phases of a project (e.g. design, build, test, implement). Whereas, borrowing from the agile project ways of working refers to, amongst other things, an approach of releasing benefits (e.g. A CP or Modification) throughout the process of progressing the project.

Issue 93's scope covered many specific topics to review and propose recommendations for. Prior to the first Issue 93 meeting, Elexon created a product backlog[9], assigning each topic an "Aspect identifier"[10] and conducting a prioritisation exercise for each aspect in the product backlog using the MOSCoW[11] technique. This enabled the WG to focus on delivering solutions to the highest impacting Aspects early in the lifecycle of Issue 93, whilst also de-prioritising or even de-scoping Aspects that were deemed to provide little or no value.

Elexon created a live document that contained all prioritised Aspects, and shared this with the Issue 93 WG. Furthermore, Elexon and the WG continued to prioritise the Aspects throughout the nine main WG meetings. This exercise encouraged the WG to proactively re-prioritise Aspects in response to changing industry concerns and opinions on the value of each Aspect.

Focusing on specific prioritised Aspects allowed Elexon and the WG to progress the recommendations to aspects as soon as they were confirmed and agreed as CPs, prior to the conclusion of the Issue Group. This method of continuous smaller delivery of recommendations (as opposed to one large delivery) is more aligned with agile principles of project delivery.

As recommendations were confirmed with the WG, Elexon assigned each "completed Aspect" to a batch. Borrowing from agile ways of working, we treated these like a sprint[12]; each consisting of around three CPs or Modifications. The first sprint containing changes that were determined as quick wins was delivered on 30 June 2022 as part of the Standard June 2022 BSC Release[13]. The second sprint consisting of high value changes and identified "must haves" has completed the design stage and is scheduled to enter the implementation phase in Q4 of 2022.

As part of the closure of Issue 93, Elexon prioritised and assigned all of the remaining recommendations captured in the progression plan in appendix 2, to a later batch, dependent on their value to industry and the amount of resource required to meet the design and delivery requirements of each aspect.

[9] A product backlog refers to a list of proposed change items (CPs, Issues and Modifications), which are not actively being worked on.
[10] Referred to the relevant SME within Elexon that is responsible for progressing the said aspect.
[11] Must Have, Should Have, Could Have and Won't Have.
[12] This refers to a set period of time during which specific tasks or items must be completed.
[13] https://www.elexon.co.uk/release/list-of-change-releases-for-2022/

Running a BSC Issue under this new more agile ways of working has received much positive feedback from industry who were happy that the positive value of the Issue 93 aspects could be delivered quickly and efficiently once those recommendations had been reached.

Impact of the Retail Code Consolidation Review on Issue 93

Between March and June 2020, we paused work on Issue 93 to focus on supporting Ofgem and industry with delivering the Retail Code Consolidation Significant Code Review (RCC SCR)[14]. It was expected that the RCC SCR would impact the available resources from the Elexon Metering Team to progress Issue 93, but it was not until Ofgem made its policy decision in February 2021[15] that the exact impact could be determined.

Elexon undertook a significant exercise to review and amend the BSC and Code Subsidiary Documents (CSDs) (around 50 documents) to facilitate RCC SCR. Changes to the BSC were given effect via P420 'Retail Code Consolidation Significant Code Review'[16].

In Ofgem's Retail Energy Code v2.0 and Retail Code Consolidation Consultation decision[17], published in April 2021, it confirmed that the Supplier Volume Allocation Meter Operator Agent (SVA MOA) arrangements, including Qualification, would transfer from the BSC to the Retail Energy Code (REC). It would also require SVA MOAs to comply with the BSC CoPs. Further, Ofgem re-iterated its support for the progression of Issue 93 and would not seek to move or amend the CoPs until the review was complete. Ofgem also noted that "should it be appropriate, we will work with BSCCo and RECCo to take forward any conclusions of the Issue Group in due course." We continued engagement with Ofgem, RECCo and the Department for Business, Energy and Industrial Strategy (BEIS) on the progress of Issue 93.

The four-month delay, the upcoming Christmas period and other competing priorities resulted in the need to extend the Issue 93 review beyond the approved 12-month timeline.

Request to extend the Issue 93 review

A request to extend the Issue 93 review by an additional six months was presented to the ISG (ISG249/06[18]) and SVG (SVG251/05[19]) at their meetings on Tuesday 11 January 2022. At the meetings, we presented the progress and achievements of Issue 93, explaining the reason for the extension request, which was mainly outside of the Issue Group's control.

The ISG and SVG members noted the proposed timetable for the additional six months, and unanimously approved the extension request. As a result, the completion date for Issue 93 was pushed back from January to June 2022.

Issue 93 Workgroup meetings

The Issue 93 review was progressed via nine main Workgroup meetings and four subgroup meetings to discuss specific and more complex Aspects. The recommendations from the Subgroup meetings were brought back to the main Issue 93 Workgroup for decision.

[14] https://www.elexon.co.uk/mod-proposal/p420/
[15] https://www.ofgem.gov.uk/publications/retail-energy-code-v20-and-retail-code-consolidation
[16] https://www.elexon.co.uk/mod-proposal/p420/
[17] https://www.ofgem.gov.uk/publications/decision-retail-energy-code-v20-and-retail-code-consolidation-consultation
[18] https://www.elexon.co.uk/meeting/isg249-2/
[19] https://www.elexon.co.uk/meeting/svg251/

Workgroup 1

The first Workgroup meeting was held on Friday 26 February 2021. The objectives of this meeting were:

- Provide an overview of all the Aspects associated with Issue 93
- Confirm if there were any additional topics that should be covered as part of the Issue group
- Determine a prioritisation process for progressing the Issue

At this meeting, Elexon reminded the Workgroup members of the BSC Issue process, provided an overview of Issue 93 and determined a prioritisation process for all of the captured Aspects.

The Workgroup also considered “end-dating” CoPs 6, 7, 8 and 9 as part of Aspect 01 ‘Consolidation of the CoPs’, an Aspect that will seek to remove obsolete requirements in the CoPs and make them consistent.

The Workgroup wanted to confirm if the MPANs in CoPs 6 to 9 were being utilised or were there errors in the data being reported on these CoPs. The Workgroup believed that if the MPANs in CoPs 6 to 9 aren’t utilised, then CoPs 6 to 9 should be “end-dated”. Elexon welcomed the WG’s view and took an action to investigate its internal data sources to confirm the number of active Metering points registered in CoPs 6 to 9.

Workgroup 2

The second Workgroup meeting was held on Monday 14 June 2021. The objectives of this meeting were:

- Reconvene the Issue 93 workgroup
- Review redlining completed to date
- Share prioritisation scores for the identified Aspects
- Agree the next steps for progressing Issue 93

At this meeting, the Proposer introduced a new Aspect to the existing list of Aspects previously captured when Issue 93 was initially raised. Elexon updated the Workgroup on the proposed draft redline text for Aspects 09, 12 and 15, and captured comments from the Workgroup. The Workgroup suggested some minor changes to the redline text, which Elexon noted and confirmed would be included. Elexon recommended that the solutions for the three Aspects are implemented via a CP. The Workgroup agreed.

The Workgroup also prioritised Aspects 07, 08, 10 and 11 to be discussed at the third and fourth Workgroup meetings.

Workgroup 3

The third Workgroup meeting was held on Thursday 19 August 2021., The three-month time period between this and the second Workgroup meeting was due to the work undertaken by Elexon to support the RCC SCR, ensuring the BSC aligns with the REC.

Elexon updated the Workgroup on the progress of the raised CPs that were recommended in the second meeting. Furthermore, Elexon proposed draft redline text for Aspect 10 and presented its view on Aspects 11, 07 and 08, welcoming comments from the Workgroup. The Workgroup noted the updates on the proposed CPs for Aspects 09, 12 and 15. The Workgroup considered and agreed to Elexon’s view on Aspects 11, 07 and 08, but

suggested some additional requirements to make the solution robust. More details of the conclusion for Aspects 10, 11, 07 and 08 can be found in section 4 of this document, under the respective Aspects.

The Workgroup agreed to:

- A monthly schedule for the Workgroup meetings;
- Schedule the first subgroup session with the relevant experts to discuss Aspect 08; and
- Prioritise the below aspects to discuss at the next Workgroup meeting:
    - Aspect 07 Considerations of DMP vs AMP;
    - Aspect 08 Number of measuring elements; and
    - Aspect 11 Relevant CoP or embedded circuits.

Workgroup 4

The fourth meeting was held on Friday 17 September 2021. The objectives of this meeting were to:

- Update the Workgroup on the progress of the in-flight CPs;
- Confirm the approach for the proposed subgroup meetings; and
- Confirm the decision on previously reviewed Aspects 11 and 07.

The Workgroup agreed on the scope of the first subgroup meeting, noting and this would cover the discussion of Aspect 17 'Minimum burden requirements and CT ratio vs circuit capacity'.

Elexon proposed to issue an industry wide Request For Information (RFI) to confirm the number of MPANs registered in CoP 6 to 9 sites and if industry agrees with the idea of "end-dating" CoPs 6 to 9. The Workgroup noted and agreed with the proposed approach.

Subgroup meeting to discuss Aspect 17

The first and second subgroup meeting for Aspect 17 'Minimum burden requirement and CT ratio vs circuit capacity' were held on Friday 29 October 2021 and Monday 21 February 2022 respectively. The main objectives were to agree on a solution for this Aspect and confirm the redlining requirements with expert input from subgroup members.

Elexon explained the background, noting that a few of the members were not part of the main Issue 93 Workgroup. Elexon initiated the discussion by asking the Workgroup some questions to understand the following points:

- What the current practices in the market were;
- What the future development will be; and
- What the group thought about the proposed solution.

Further discussions across two subgroup meetings led the Workgroup to conclude that the Issue group must ascertain if there is an issue to resolve in this Aspect. If so, any requirements specified in the BSC related to burden must not diverge from the IEC standards. Elexon noted the recommendation and confirmed that it will be presented to the main Issue 93 group.

Subgroup meeting to discuss Aspect 08

This meeting was held on Friday 5 November 2021 to discuss Aspect 08 'Measuring elements on neutral and earth conductors'. The objectives of this meeting were to agree on a solution for this aspect and confirm the redlining requirement.

Elexon explained the background of this Aspect, highlighting the main issue that the current wording for the number of measuring elements required for Meters in Section 5.3 of the CoPs lacks clarity.

Further discussions led the subgroup to recommend the following:

- The underlying issue of this aspect could be mainly linked to communications between Parties and not necessarily the number of CTs to be specified in the CoPs; and
- The "zero sequence energy" text should be removed from Section 5.3 of the CoPs.

You can read more about the final recommendation for this aspect in section 4 of this document.

Workgroup 5

The fifth Workgroup meeting was held on Friday 26 November 2022 where the aim as to confirm new CPs to be raised, recommend a subgroup to discuss the Communications Aspect of Issue 93, and confirm the Issue group's view on the proposed migration of the CoPs to the REC.

Elexon presented the recommendation from prior subgroup meetings, which were held to agree a solution for Aspects 08 and 17. The Workgroup noted and provided their views on both Aspects, which have been documented in the **Aspects** considered and their conclusion section of this paper.

Elexon sought the Workgroup's view on the migration of the CoPs from BSC to REC, to which a few members commented. In general, the majority of the members were in favour of keeping the CoPs in the BSC. The minority initially favoured the CoPs moving to REC but after further review of Elexon's rationale, the minority changed their view and favoured the CoPs remaining in the BSC.

Finally, Elexon informed the Workgroup that it was intending to seek a further six month extension to the Issue 93 progression plan. This meant that the Issue 93 review would conclude in June 2022, subject to approval from the ISG and SVG. The Workgroup noted and agreed with this.

Workgroup 6

The sixth Workgroup meeting took place on Monday 17 January 2022 where we aimed to confirm a decision on Aspect 07 'Considerations of DMP vs AMP', update the Workgroup on Issue 93's progression plan and present the outcome of the "end dating CoPs 6 to 9" RFI.

Elexon informed that Workgroup that no responses were received to the "end-dating" CoPs 6 to 9 RFI, which was issued between Friday 26 November and Thursday 23 December 2021. Furthermore, Elexon suggested that the RFI is re-issued to industry, to which the Workgroup agreed.

At this meeting, the Workgroup discussed and arrived at a decision for Aspect 11 'Determining the relevant CoP for embedded circuits', which was to raise and progress a CP.

Also, the Workgroup progressed the discussion on Aspects 04 ‘Calibration checks for Main and Check Meters’, 06 ‘Inconsistent use of MWh vs kWh’, to which suggestions were made by some Workgroup members that required further investigation to be carried out in order to arrive at a decision. Elexon took actions to investigate both Aspects and confirm our view on them. You can read more about Elexon and the Workgroup’s view in section 4 of this document, under the respective Aspects.

Workgroup 7

The seventh Workgroup meeting took place on Monday 21 March 2022. The main objectives were to keep the Workgroup updated on the progress of all Aspects and to confirm a decision on previously reviewed Aspects.

Elexon reminded the Workgroup that CP1550, CP1553 and CP1554 had been raised since the previous meetings to implement the solution for Aspects 15, 09 and 12 respectively.

At this meeting, Elexon recommended the closure of Aspect 06 ‘Inconsistent use of MWh versus kWh’ with no further action or change required, outlining the rationale behind this. You can read more about the rationale in the conclusion section of this paper, under the Aspect 06.

Also, Elexon confirmed from the Workgroup that a CP should be raised to implement the agreed solutions for Aspects 05, 08 and 14.

Any other Business (AOB) Items

Elexon presented a background of Aspect 02, which looks at reviewing and ceasing the use of the NHH and HH terminologies in the CoPs, to support the Market-Wide HH Settlement (MHHS) changes. Elexon’s view was that the Workgroup did not need to spend extra effort discussing this Aspect, as the intended solution was already being effected in Aspect 01 and the CoP4 review exercise (conducted outside of Issue 93). CoPs 1, 2, 3 5 and 10 will be reviewed and all NHH and HH references will be removed.

The Workgroup and Proposer agreed with the approach. You can read more about Aspect 02’s conclusion in section 4 of this document, under Aspect_02 – HH vs NHH requirements section.

Subgroup 4

This subgroup meeting was held on Monday 25 April 2022 to discuss the Communications path Aspects. The main aims of this meeting were to:

- Understand the current requirements for remote communications as set out in the CoPs;
- If existing communication technologies were to be ceased, what impact will this have on current metering population; and
- Exploring the security issues associated with public Internet Protocol (IP) address versus the private IP address.

The Workgroup discussed emerging communication technologies, considering the following questions from Elexon:

- If the clause in CoPs 3 and 5 align with the future of remote communications (and existing technologies); and
- If the examples of acceptable remote communications in the CoPs are outdated or if they should be updated to reflect emerging technologies.

Elexon noted that the issues highlighted will impact the current metering population in the following ways:

- Metering Systems communicating over Public Switched Telephone Network (PSTN) will gradually stop working reliably between 2022 and 2025;
- Metering Systems communicating over Circuit Switched Data (CSD) will gradually stop working reliably between 2022 and 2025; and
- General Packet Radio Service (GPRS) over 2G will become unreliable and cease to work completely once the Mobile Network Operators (MNOs) switch off their networks

The Workgroup further discussed PSTN, the issue in Aspect 03 'Duplicate communications path for Metering Equipment in the CoPs' and Aspect 13 'Security of using public IP addresses for Communications to Metering Systems', and concluded on some recommendations. To read more about the recommendations, please refer to section 4 of this document, under sub section Aspect 03 and 13.

Workgroup 8

The eighth Workgroup meeting was held on Wednesday 18 May 2022. The main objectives of this meeting was to confirm a decision on 'end dating' CoPs 6 to 9, Aspect 16 'Obsolete Metering Equipment' and updated the Workgroup on the progress of the remaining Aspects.

Prior to the meeting, Elexon had invited BEIS to present their view on whether the National Sample Survey, for nationally approved Meter types, covered Meter types in the above 100kW HH market. At the meeting, BEIS confirmed that the National Sample Survey does not cover Non-Domestic Premises as these Customers can use a non-certified Meter with the agreement of the Supplier and BEIS rely on CoP4 Calibrations in this market but ultimately Suppliers are still responsible for ensuring in service limits are maintained in the above 100kW HH market. Elexon and the Workgroup noted the information from BEIS. Further, Elexon confirmed that the information was useful to finalise the recommendation on Aspect 04 'Calibration of main and check meters'.

Elexon presented the recommendations on Aspects 03 and 13 that were captured in the Communication path subgroup meeting, and asked if the Workgroup agreed with the recommendation or had any further comments to add. The majority of the Workgroup members welcomed the recommendations, noting that it was important to make industry aware of the perceived risks of the current metering population ceasing to work. Elexon noted and confirmed that it will seek to organise an industry wide communication group for the purpose of raising visibility across industry and gathering initial views from industry members.

Elexon presented the outcome of the 'end dating' CoP 6 to 9 RFI, recommending to the Workgroup that these CoPs should be excluded from the solution for the consolidated CoPs.

Workgroup 9

The ninth and final Workgroup meeting was held on Friday 24 June 2022. The main objectives of this meeting were to confirm the decision on previously reviewed Aspects, discuss and agree the solution for Aspect 18 'Clarify DMP for LV supplies', and conclude the Issue 93 review.

Elexon presented its recommendation on the consolidation of the CoPs via a threshold table, and welcomed feedback from the Workgroup. The Workgroup noted and agreed to the recommendation. The full details of the recommendation can be found in section 4 of this document, under Aspect 01 'Consolidation of the CoPs'.

Elexon presented its final recommendation on Aspect 13 ‘Security of using public IP address for communications’ and welcomed views from the Workgroup. In general, the Workgroup concluded that a wider industry review needs to be organised by Elexon to consider the recommendation to ensure that industry is engaged and prepared for the upcoming communication changes. Elexon agreed and confirmed that a wider industry review will be facilitated to consider the proposed solution for this aspect.

Elexon also presented its recommendation on Aspects 04 ‘Calibration checks for main and check Meters’, 16 ‘Obsolete Metering Equipment’, 17 ‘Minimum burden requirements and CT ratio versus circuit/agreed capacity’, and asked the Workgroup if they agreed with the recommendations or had any further points to add.

The Workgroup discussed the final Aspect, Aspect 18 ‘Clarify the DMP for LV supplies’ considering the background and issue as outlined by Elexon. Elexon presented two possible solution options to the Workgroup, which were:

- **Option A**: Formalising the DMP in Appendix A of the relevant HH CoPs as the ‘point of connection’ to the Total System; or
- **Option B**: Formalising the DMP in Appendix A, for LV supplies, as ‘the low voltage side of the Low Voltage transformers’ connected to the Total System.

The Workgroup generally felt that option b was the better option. However, in response to option b, they highlighted an issue with meters not being at the Boundary Point (BP) and the addition of the wrong requirement could lead to a Trading Dispute being raised. In response, Elexon verbally presented a third option which the Workgroup agreed to. Elexon took an action to document this option and circulate this with the group for further review.

4. Aspects considered and their conclusion

Aspect_01 – Consolidation of the CoPs

Background and Issue

This Aspect was suggested with the intention of combining all of the CoP documents, except CoP4, into one document. The intention was to develop a clearer and easier to use document for all parties who make use of the CoPs.

The Proposer highlighted that having separate CoP documents introduces friction in the maintenance of them, which can result in the risk of parties misinterpreting them. The Proposer further noted that there were instances across CoPs 1, 2, 3, 5 and 10 where the requirements are duplicated, therefore, having one single CoP is more efficient to maintain and aids the industry wide code simplification.

Progression and conclusion

This Aspect was initially discussed at the fifth Issue 93 Workgroup meeting and concluded at the ninth Workgroup meeting, where Elexon outlined the key categories for different Metering System configurations and posed some questions to the Workgroup to understand the below areas:

- What should the accuracy class of the lower high voltage (HV) CTs Megavolt Ampere (MVA) range be;
- Should Reactive Energy Meters be more accurate (i.e. to British Standard (BS) EN (European Normative) or International Electrotechnical Commission (IEC) 62053-24[20]);
- What should the communications pathway requirements for lower HV CT MVA range be;
- Should we have diverse cable routing for the HV categories;
- Should auxiliary supplies for Outstations be mandatory for HV CT categories; and
- Should we use different Meter manufacturers for the upper HV category?

The Workgroup discussed the questions above and arrived at the following suggestions to consider:

- All changes to be made must not be retrospective as it could create unwanted cost for industry;
- Meters that are used must be able to integrate with other communications system using different protocol;
- Compensation for CT and Voltage Transformer (VT) errors in the upper HV CT MVA band must be mandatory but optional in the lower HV CT MVA band;
- Guidance should be added to the CoP proposing that it is good practice to use diverse cable routing;
- Using auxiliary supplies for Outstations in the upper HV CT MVA band must be mandatory but optional in the lower HV CT MVA band; and

[20] 'Electricity metering equipment. Particular requirements - Static meters for fundamental component reactive energy (classes 0,5S, 1S, 1, 2 and 3)'

- Using Meters from different manufacturers in the upper HV CT MVA band must be mandatory but optional in the lower HV CT MVA band.

The outcome of the discussions for this Aspect led to the creation of the CoP Consolidation threshold table below:

Category	LV Whole Current	LV CT	HV CT up to (and including) 40 MVA	HV above 40MVA
Main/Check	Main only	Main only	Main and Check	Main and Check
Active Energy Meter	As per Electricity Act MID/MIR for < 100kWh/h or Class 0.5S for > 100kWh/h	Class 0.5S (MID/MIR)	Class 0.5S (MID/MIR)	Class 0.2S
Reactive Energy Meter	Class 3.0	Class 2.0	Class 2.0	Class 2.0
Different manufacturer for Main and Check Meters	Not applicable	Not applicable	Optional	Mandatory
CT	Not applicable	Class 0.5S	Class 0.2S	Class 0.2S – separate CTs for Main & Check Meters
VT	Not applicable	Not applicable	Class 0.5	Class 0.2 – separate secondary winding for Main & Check Meters
CT/VT Compensation	Not applicable	Not applicable	Optional	Mandatory
Communications	Single	Single	Use Aspect_03 CP solution	
Outstation Auxiliary Supplies	Not applicable	Not applicable	Optional	Mandatory

In conclusion, the Workgroup agreed that a CP will be raised to consolidate the CoPs into one document, with the exclusion of CoPs 6, 7, 8 and 9, which are considered redundant. In addition, the requirements from the table above will be consistently reflected across CoPs 1, 2, 3, 4, 5 and 10, which will now sit in one document.

Aspect_02 – HH vs NHH requirements

Background and Issue

This Aspect was raised to review the use of the HH and NHH terminologies in the CoPs. The Proposer highlighted that the aim of considering this Aspect was to simplify and,

wherever possible, make consistent the requirement for HH and NHH settled Metering Systems.

Further, the Proposer noted that if the use of both terms within the metering CoPs can be ceased, it will future proof the CoPs for any potential changes required under Market-wide Half Hourly Settlement (MHHS). .

Progression and conclusion

This Aspect was discussed at the seventh Workgroup meeting, where Elexon explained the background and intent of the Aspect to the Workgroup, which they noted.

Further, Elexon recommended that this Aspect shouldn't be reviewed as a whole and closed, as the intended solution (updating the NHH and HH terminologies in the CoPs) was already being addressed in Aspect 01 'Consolidation of the CoPs' and the CoP4 review. The Workgroup and the Proposer agreed to the recommendation, with no further comments received.

Elexon recorded the recommendation, confirmed that all NHH and HH terminologies will be removed from the CoPs during the CoP consolidation update.

Aspect_03 – Duplicate communications paths for Metering Equipment within CoP1 and CoP2

Background and Issue

This Aspect was raised to refine the requirement for installing duplicate remote communications paths for Metering Systems in CoPs 1 and 2.

The Proposer explained that the objective of the requirement, as currently set out in Section 5.5 of CoPs 1 and 2 was intended to reduce the risk of Communications Equipment failure that could prevent remote communication with the Metering Equipment at higher volume sites. The Proposer highlights the issue as being the inconsistent wording of the requirements for "duplicate communications paths" in CoPs 1 and 2.

Progress and conclusion

Elexon established a subgroup meeting with experts on communications, which was held on Monday 25 April 2022.

At the meeting, Elexon explained the background of this Aspect, outlining the differences in the wording of the requirements in CoPs 1 and 2. Further, Elexon talked about the "Emerging" technologies and how the current requirements for duplicate communications in CoPs 1 and 2 may no longer be appropriate.

To prevent this, Elexon recommended that the wording of the duplicate communications requirements in CoPs 1 and 2 is updated to set the requirements out in more generic terms, which are not defined or restricted by a technical solution, but will deliver the intent of not having a single point of failure. The Workgroup agreed.

Elexon will progress a Change Proposal after the conclusion of the Issue 93 review to give effect to the recommendation in the relevant CSDs.

Aspect_04 – Calibration checks for Main and Check Meters

Background and Issue

This Aspect was raised and progressed to determine if reporting of Meter calibration checks are required and/or whether the requirements for the use of different Meter types should be re-instated.

The Proposer highlights the current issue as being the absence of a channel to confirm whether a calibration and operation check for main and check Meters is being carried out as expected. The Proposer explained that the CoPs used to require different makes and models for main and check Meters, to mitigate the risk of type failures of Metering Equipment. However, the requirement was removed from the CoPs by CP1244 'Review of Code of Practice 4'[21], which introduced in CoP4, a different calibration frequency for main and check Meters, the Proposer added.

Progress and conclusion

This Aspect was initially discussed and debated at the fifth Workgroup meeting and concluded at the eight Workgroup. Elexon explained the main points from the issue as being:

- The lack of Industry reporting to confirm whether Meter calibration checks were being carried out on the relevant Metering Equipment; and
- The lack of Industry reporting to highlight concerns about Meter accuracy

Further, Elexon explained that CoP4 (up to Issue 5) permitted different 'on-site testing' regimes if different Meters types were installed for main and check Meters.

The Workgroup discussed the following questions:

- Are Meter Operator Agents (MOAs) still carrying out (periodic) Meter calibrations?
- Should CoP4 have different (periodic) calibration intervals if a different main and check Meter type are fitted, or not?
- Did MOAs carry out sample calibrations on Prometer R/Ws Meter types up until 2014 (CoPs 1 and 2) and/or up until 2019 (CoPs 3 and 5)
- Should sample calibration continue under CoP4, or not, and why?

The Workgroup arrived at the following areas to consider/progress:

- In response to the first point, the Workgroup believe that parties must adhere to the requirement for completing a calibration check, if it is clearly set out in CoP4;
- It was important to ensure Meter accuracy was known, if Meters were being replaced prior to their periodic calibration check so, End of Life testing should be required; and
- Retrieve examples of sample calibration data from CVA MOAs, to confirm if they are being carried out on the Prometer R/Ws meter type. Elexon progressed an action with the CVA MOAs.

In conclusion, Elexon presented the following recommendation to the Workgroup:

[21] https://www.elexon.co.uk/change-proposal/cp1224-the-review-of-code-of-practice-4/

- Continue and reinforce the current calibration check process (periodic and sample calibrations);
- CoP specific End of Life testing; and
- End of Life testing (CoP specific sample testing of existing meter types e.g. CoP3 and CoP5 and CT non-domestic CoP10)

The Workgroup noted and agreed with the recommendations. Elexon confirmed that a CP will be progressed to reflect the recommendation.

Aspect_05 – De-energised circuits

Background and Issue

This Aspect was raised and progressed with the intention of making consistent the current requirements such as ensuring Outstations remain energised, or Meter registers can be read by Data Collectors (DCs) for de-energised circuits/feeders across the relevant CoPs.

The Proposer notes that the current requirements do not follow best practice, and can be improved. The Proposer argues that there is a risk of estimated data being submitted into Settlement

Progress and conclusion

The Workgroup debated this issue at the fifth Workgroup meeting. Elexon explained that CoP1 requires Outstations for each circuit to have an auxiliary supply. CoP2 has this requirement but only where there are multiple circuits.

CoPs 3 and 5 require an Outstation for each circuit to be connected such that it is normally energised to facilitate reading of the Meter Register(s) and Local and Remote Interrogation of the Outstation. For Outstations storing data for more than one circuit, and where the Outstation power supply is from these circuits, then a voltage selection relay scheme using each circuit involved shall be provided. CoP3 adds that separate Outstation Systems can be fed from a secure supply or from a measurement VT, with separate fusing for each Outstation, whilst CoPs 5 and 10 simply require separate Outstations to have a separately fused supply for each Outstation.

Elexon presented four options in Appendix E of the CoPs 3 and 5 for keeping Outstations energised for circuits that are not normally energised for significant periods. These options include:

- **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 [22] to meet the requirements of the Meters sections 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

[22] A Meter register is a device that records the units that are measured by the meter. There are a few different register types.

- **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, felt that option 1 was the most feasible. Although, they suggested that the practicalities of option 1 should be confirmed with the Licensed Distribution System Operators (LDSOs) before it is progressed.

Elexon worked with LDSOs to confirm the practicalities of option 1. The feedback from LDSOs confirmed that Option 1 wasn't practical and would be a risk to the health and safety of their operatives working on metering installations.

At the seventh Workgroup meeting, Elexon recommended that based on the LDSOs response, this Aspect is addressed under the Aspect 01 'Consolidation of the COPs', where it will seek to specify the different requirements within each category (e.g. HV CT Metering points above 40MVA could have auxiliary supply terminals that have dedicated supplies (not from the measurement VT connected to the customer's side)).

Further, the potential risk with estimation of data, as a result of de-energised circuits, is addressed under a separate Issue, outside of the Issue 93 review.

The Workgroup and Proposer agreed with Elexon recommendation, noting that there is a need for differing requirements for under and over 40MVA circuits. The existing site arrangements are sufficient for under 40MVA, that is, the metering is connected after the isolation point and no auxiliary supply is needed in these circumstances. 40MVA and over does require the metering to be energised at all times and therefore, need a dedicated auxiliary supply to the supply terminals of the Outstation to enable this, the Workgroup added.

The proposed changes for this Aspect will help protect the integrity of Settlements at the highest risk areas of supply by preventing unnecessary estimation, as 'zero' actual data can be retrieved remotely by the DC even if the circuit/feeder is de-energised. If there is a dial failure in CVA (e.g. because the Outstation becomes de-energised with the circuit) the Central Data Collection Agent (CDCA) will begin estimating to trend for Import site and to zero for Export sites. Trending will be wrong for a de-energised circuit (and treated as Estimates). Estimating to zero for an Export site will be correct (but treated as Estimates).

Aspect_06 – Inconsistent use of MWh vs kWh

Background and Issue

This Aspect was raised to clarify the requirement for the level of granularity of the kWh (kilowatt hours) and MWh (Megawatt hours) data specification set out in the CoPs. The Proposer explained that smart metering is driving a granularity of Watt-hours (Wh), making kWh appear to three decimal places (dp). Further, the Proposer notes that the Central Volume Allocation (CVA) convention is to use MWh data to 5dp, which is equivalent to kWh to 2dp.

Progression and conclusion

The Workgroup discussed this Aspect at the seventh meeting, where Elexon explained its background and intent. Further, Elexon presented information extracted from the BS EN/IEC Meter standards which confirmed the granularity of data being recorded and the requirements guiding the resolution of energy.

Elexon explained to the Workgroup that if there was a requirement in the BS EN/IEC standards, more onerous than what is in the CoPs, or what a particular dataflow requires, then there isn't really a need to specify another requirement in the CoPs.

Further, Elexon explained that the issue highlighted in the Aspect, when it was raised, is more related to the dataflows, as the decimal places are dictated by them. If the decimal places need to be updated, then a change will need to be progressed via the BSC/REC Data Specification process. The change would seek to update the decimal places in the D0036[23] data flow, to align it with the Smart Metering Equipment Technical Specification (SMETS) data flow. However, this approach will need to be explored outside of the Issue 93 review.

Elexon recommended to the Workgroup that this aspect should be closed and not progressed any further. The Workgroup and Proposer agreed.

Aspect_07 – Consideration of DMP vs AMP

Background and Issue

This Aspect was raised and progressed with the intent of reducing the unnecessary administrative burden on stakeholders where Settlement accuracy is not impacted by the Actual Metering Point (AMP) and Defined Metering Point (DMP) proximity.

The Proposer notes that the current arrangements means that where the cable or line loss has no material impact on Settlement data, a Metering Dispensation application is still required, which needs to be supported by Elexon and the relevant BSC Panel Committee. This creates unnecessary and avoidable administrative burden for Elexon and the relevant Panel Committee(s).

Progress and conclusion

This Aspect was discussed at the third Workgroup meeting. Elexon presented the background and issue, confirming that the desired solution already exists for AMP but not for DMP.

Elexon proposed a solution, which will consider expanding the allowable distance between the AMP and DMP where overall accuracy can be maintained, currently outlined for AMP, to cater for other scenarios in Appendix A 'Defined Metering Point' of CoPs 1, 2, 3 and 5. The solution will also state that there should be no connected equipment between AMP and DMP (e.g. parasitic loads, power transformers). Also, the solution will seek to define the limits where loss compensation does not need to be required.

Further discussions by the Workgroup at the fourth and fifth meetings led Elexon to recommend a new BSCP32 'Metering Dispensation' process. The process will cater for the below examples, which are acceptable for dispensations. They examples are:

[23] Validated Half Hourly Advances for inclusion in Aggregated Supplier Matrix

- **Example 1**: Where the Metering Equipment was at the AMP and not the DMP, has the same voltage level but no cable/power transformer compensation will be applied to maintain accuracy within allowed overall accuracy limits specified in the relevant CoP;
- **Example 2**: Where the Metering Equipment was at the AMP and not the DMP, has the same voltage level and cable losses applied via compensation in either the Metering Equipment or aggregation rule;
- **Example 3**: Where the Metering Equipment was at the AMP and not the DMP, has a different voltage level and no compensation applied to maintain accuracy within allowed overall accuracy limits specified in the relevant CoP; and
- **Example 4**: Where the Metering Equipment was at the AMP and not the DMP, has a different voltage and losses applied via compensation.

Elexon confirmed that a BSC Modification will be raised to update Section L and all relevant CSDs to reflect the proposed BSCP32 Metering Dispensation process. This change will be progressed after the conclusion of the Issue 93 review to effect the change. The Workgroup noted and agreed.

Aspect_08 – Measuring elements on neutral and earth conductors

Background and Issue

This Aspect was raised and progressed to review the ambiguity in the wording currently outlined in Section 5.3 'Meters' of the CoPs that sets out the requirement for the number of measuring elements. The issue further highlights that this requirement was missing from Section 5.1 'Measurement Transformers'.

The Proposer explained that the Metering CoPs contain requirements that outline the need for metering on all measuring elements. Further, the requirements don't appear to be sufficiently clear or are not being complied with, highlighting a scenario where a MOA reported the lack of clarity on determining the number of measuring elements required by the CoP.

Progression and conclusion

This Aspect was discussed and debated at the second subgroup meeting under Issue 93, which took place on Friday 5 November 2021.

At this meeting, Elexon presented the background and issue to the experts, asking the below questions, with our recommendations to each question, to steer the conversation:

- Should an equivalent statement for the number of CTs and a requirement for a voltage neutral be added to Section 5.1 'Measurement Transformers' of the CoPs?
- How many CTs are LDSOs fitting as standard for HV Metering Systems on the Distribution System?
- Is there an increase in customer requests for an additional CT?
- Should the CoPs mandate 3 CTs for HV Metering Systems on the Distribution System?

The Workgroup considered the questions above, discussed the current industry practices, future developments and explored some potential solutions for the issue. They concluded that the relevant CoPs will be redlined to provide clarity. The proposed changes include:

- Deleting parts of and amending 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 of the relevant CoPs; and
- Introducing an explanation on how neutral and earth conductors are applied in section 5.1 ‘Measurement Transformers’ of the CoPs

The Workgroup agreed to the recommendation. Elexon noted and confirmed that a CP will be progressed after the Issue 93 review, to implement the agreed solution.

Aspect_09 – Tightening the minimum accuracy classes for Meters and CTs

Background and Issue

This Aspect was raised and progressed to revise the minimum accuracy class requirements for certain Meters and CTs.

The Proposer argued that improving the minimum accuracy class for CoP5 Meters and CoPs 3, 5 and 10 CTs will enable easier compliance with the CoP overall accuracy requirements. The Proposer explains that where a LV CT metering installation does not have calibration certificates that outline specific test point errors but, only a certificate of conformity, the current requirements in CoP5 will not allow the overall accuracy to be proved to be compliant, if the current minimum accuracy classes (i.e. in CoP5, a class 2.0 Meter and Class 0.5 CT) are referenced, resulting in Category 2 non-compliance for the Metering System.

The Proposer argues that this issue could be avoided via reducing the acceptable class of Meters and CTs to ensure their combination is always within the CoP overall accuracy, 1.5%.

Progress and conclusion

This Aspect was discussed at the second Issue 93 Workgroup meeting. Elexon presented the background, highlighting the issue to the Workgroup.

Elexon confirmed to the Workgroup that it had no intentions of constraining the requirements to LV metering only. Further, Elexon highlighted to the Workgroup that the IEC standards do not recommend using ‘S’ class CTs with a non-‘S’ class Meter due to the ‘S’ class CT being rated to operate accurately down to 1% of the rated current but, a Meter that was not ‘S’ class is rated to operate accurately down to 5% of the rated current.

Therefore, Elexon recommended a CP is raised and progressed to tighten the minimum accuracy class of CoP5 Meters to Class 1 and CoPs 3, 5 and 10 CTs to 0.5s. The Workgroup agreed.

Elexon raised (on 2 November 2021) and implemented (on 30 June 2022) CP1553 ‘Tightening the requirements for the minimum accuracy classes for Meters and Currents Transformers in the CoPs’[24].

[24] https://www.elexon.co.uk/change-proposal/cp1553/

Aspect_10 – Reactive only Sites

Background and Issue

This Aspect was raised and progressed to provide clarity in the relevant CoPs, on the requirements related to reactive only sites proposed by NGESO.

Progress and conclusion

This Aspect was discussed initially at the third Issue 93 meeting, and finalised at the fourth meeting.

At the third Workgroup meeting, Elexon explained the background and issue, and confirmed that CoPs 2 and 4 had been updated to clearly define “Reactive Power Service” as being any service which imports and exports Reactive Energy but does not result in the production or export of any Active Power to the Total System.

The Workgroup noted the recommendation.

Further, Elexon asked the Workgroup a question to confirm what the measurement transformer manufacturers thought about testing additional point at the Reactive Power Service sites. No comments were made by the Workgroup members. An action was taken by a member representing LDSOs to confirm this view from manufacturers.

At the fourth Workgroup meeting where this aspect was finalised, Elexon presented an updated draft redline text to CoPs 1 and 2, which included:

- Expanding the scope of the solution to cater to site where Metering Equipment is designed for the Active Export but also required to measure Active Import;
- Updating the definition of Predominantly Reactive Power Site and Predominantly Active Export Site in CoPs 2 and 4; and
- Adding a requirement in CoP2 for additional test points specified in CoP for Predominantly Reactive Power Site, and require Overall Accuracy to be met for the Active Import at a Predominantly Active Export Site.

Elexon posed a question to the Workgroup to understand how the scenario where Metering Equipment that currently measures Active Export (AE) also measure Active Import (AI), should the relevant CoPs require additional tests on the CT if the level of current is below 1%Ir, should be handled.

The Workgroup discussed the points and question above, and concluded that a statement should be added to the relevant CoPs to advise customers who will operate outside of the Overall Accuracy points for %Ir and power factor the BSC requires. Elexon noted this feedback and confirmed that a CP will be progressed after the Issue 93 review concludes, to reflect the agreed recommendation.

Aspect_11 – Determining the relevant CoP for embedded circuits

Background and Issue

This Aspect was raised and progressed to provide clarity in the relevant CoP to ensure the correct metering is installed and the need for future Metering Dispensations are reduced.

The issue highlighted in this Aspect is the lack of clarity on how to determine the relevant CoP to specify for the applicable Metering System when considering the following:

- The rating of the lowest primary apparatus of the distribution equipment versus the customer equipment;
- The connection agreement versus the lowest rating of the primary apparatus; and
- What constitutes as the lowest rated primary apparatus (generator versus cable/transformer).

Progression and conclusion

This Aspect was discussed initially at the third Workgroup meeting, where Elexon explained the background and issue. Elexon explained that it sought to understand which CoP should be used where a Metering Dispensation is applied to meter an embedded circuit for Settlement purposes. Some members believed that the circuit capacity of the metered circuit should determine the relevant CoP applicable to that circuit – meaning that if the circuit is above a certain threshold, then the next higher CoP should apply.

Elexon noted the view and proposed to clarify the wording in the Foreword and Appendix A section of the CoPs to explain how embedded circuits should be handled where the rated capacity at DMP and embedded circuit are at different CoPs. The Workgroup agreed with this proposal. Elexon took an action to update the draft redline text to reflect the views from the Workgroup members.

At the sixth Workgroup meeting where the solution for this aspect was finalised, Elexon presented its view on what the relevant CoP should be, as being:

- The CoP that the Metering Equipment would be required to be registered against, were it located at the DMP. Elexon noted that its current guidance takes this approach;
- The CoP relevant for the capacity of the embedded circuit where the Metering Equipment is located.

Elexon further outlined some points of consideration, and asked the Workgroup what their final views were, on the relevant CoP in relation to embedded Metering Systems.

Most members leaned towards the second bullet point outlined above, stating that the first recommendation could lead to LV circuits embedded behind a CoP1 Boundary Point being required to register against CoP1, which isn't desirable.

In conclusion, Elexon proposed to amend paragraph 4.3.3 of CoPs 1, 2, 3 and 5 to state explicitly that where AMP does not coincide with the DMP, but the overall accuracy of the relevant CoP can still be met without the need for any compensation for cable, line and busbar losses, then a Metering Dispensation will not be required.

Additional, Elexon will update the Foreword and Appendix A section of CoPs 1, 2, 3 and 5 to clarify how embedded circuits should be handled where the rated capacity at the DMP and embedded circuits are at different CoPs. The Workgroup agreed.

Elexon noted this and confirmed that a CP will be progressed after the Issue 93 review concludes, to reflect the proposed recommendation.

Aspect_12 – Future proofing changes to the IEC Standards in the CoP

Background and Issue

This Aspect was raised and progressed to address the current challenges of stranded Metering Equipment.

The Proposer explains that the metering CoPs rely on British Standards Institution (BSI) IEC) standards for Meters, current transformers and voltage transformers. These standards are reviewed every five years and as a result, they may be extended, amended, or withdrawn. When the standards are amended, their reference number may change.

The Proposer highlights the issue as the lack of clarity on what is allowed when the reference number changes. Ultimately, this creates uncertainty for LDSOs and MOAs who have to keep stock of the applicable Equipment.

Progression and conclusion

This Aspect was discussed and debated at the first Issue 93 Workgroup meeting that took place on Friday 26 February 2021.

Elexon proposed a solution which seeks to amend the CoPs to allow:

- Stocks to be used up where manufactured to the previous standard where the CoPs will have been updated to the new standard(s); and
- Install Metering Equipment manufactured to the new standard where the CoPs still refer to the previous standard (s)

The Workgroup agreed. Elexon progressed CP1554, which was implemented on 30 June 2022, to give effect to the agreed solution.

Aspect_13 – Security of using public IP addresses for Communications to Metering Systems

Background and Issue

This Aspect was raised and progressed to provide assurance and address concerns around the security of providing IP communications via public connection methods. Many of the communications technologies mentioned in the CoPs are outdated and will soon need to be replaced with the newer emerging technologies.

Also, there are no clear requirements in the CoPs that provide guidance on if IP based communication methods should operate on a public or private basis. This can lead to interoperability issues within the private IP space and security concerns within the public IP space.

Progression and conclusion

This Aspect was discussed at the fourth Issue 93 Subgroup meeting that took place on Monday 25 April 2022. The scope of this meeting covered remote communication requirements in the CoPs.

At this meeting, Elexon explained the difference between public and private IP addresses, noting the benefits and risks of both channels. Elexon asked the Workgroup what they thought about using public or private IP addresses.

Some members explored the option of having whitelisted access on public IP address, to which other members commented advising that providers may not be able to support such arrangements due to limited resources. One member supported private IP address but added that BSC Parties should be allowed to choose which method they wish to use. The same member added that public IP addresses can be paired with private Access Point Names (APNs), and as long as access is granted to the authorised persons, no re-programming of the SIMs used in the Metering System will be required.

Elexon, noting that there could be a security risk attached to the suggestion above, took an action to investigate the possibility of creating a national private APN, which will be mandated for all Advanced HH Meters.

Further conversations on the issue led the Workgroup and Elexon to conclude the following:

- Create a “Communications Guidance Note”;
- A new process (potentially in BSCP601) for the approval of communications methods. These methods (once approved) could then be added to either the CoPs or the new Guidance Note. This will also facilitate the removal of ageing and defunct Communication types (such as PSTN, Paknet, etc_);
- An RFI to seek views from industry on Public vs Private IP communications methods; and
- Elexon to investigate the establishment of a “national APN” to be required to be placed on all Advanced Metering Sims to resolve.

Elexon confirmed that the RFI will be issued after the Issue 93 review concludes, to seek industry’s views on Public vs Private IP communications methods. Furthermore, the feedback from the RFI will inform the CP that is progressed to implement the agreed recommendations. The Workgroup agreed.

Aspect_14 – Requirements to provide SLDs for HV and EHV sites

Background and Issue

This Aspect was raised and progressed with the intent of ensuring that Single Line Diagrams (SLDs) are provided to the Technical Assurance Agent (TAA) to help maintain assurance, especially in scenarios where AMP is not aligned with the DMP. Additionally, MOAs will be more informed on how to set up Complex Site aggregation rules by referring to the SLDs.

Progression and conclusion

This Aspect was debated at the seventh Workgroup meeting. At the meeting, Elexon explained the background of this Aspect, outlining the concept of desktop audits that was introduced in P391[25], which requires LDSOs to submit SLDs for each Metering System being audited.

However, Elexon added that feedback from industry highlights that there is no requirement in the BSC to produce SLDs and as such, parties have not felt incentivised to create them.

Elexon posed the following questions to the Workgroup to seek their views on what the solution for this Aspect should be. The questions were as follows:

- if the Workgroup agrees with the proposal to add a requirement in CoPs 1, 2, 3, 5 and 10 that an SLD must be created and auditable for each HV and EHV Metering System;
- If the Workgroup agrees that this requirement should not apply to LV Metering Systems;
- If the Workgroup was comfortable with the CoPs using the same definition which will be implemented under P375[26] and R0018[27]; and
- If the Workgroup had any comments on the current TAA guidance in relation to what should be include in the SLD.

Following the debate, the Workgroup concluded that a requirement should be added to the CoPs that mandates that an SLD must be created and be auditable for new HV and EHV Metering Systems, or reconfiguration of EHV and HV sites, which may introduce additional Boundary Point connections. Additionally, Elexon will clarify that this change won't impact existing EHV and HV sites.

Elexon noted the recommendation from the Workgroup and confirmed that a CP will be raised after the Issue 93 review concludes, to reflect the recommendation. The Workgroup agreed.

Aspect_15 – Monitoring of Voltage failure

Background and Issue

This Aspect was raised and progressed with the intention of mitigating the risk associated with reporting of voltage failures to a manned location, which can lead to incorrect Settlement data being identified and preventing prompt resolution.

The Proposer explains that the current requirement in Section 5.1.3 of CoPs 1 and 2 that requires a voltage failure to be reported to a manned location the next Working Day (WD) is outdated and reflects the legacy arrangement for Outstations that do not possess the capability to promptly alert the DC to a potentially serious error with the Settlement Data. The Proposer argues that newer Outstations will possess remote notification capabilities, therefore, the requirements in CoP 1 and 2 should be reviewed for improvement.

Progress and conclusion

This Aspect was discussed at the first and second Workgroup meeting, where Elexon presented the background, issue and suggested the solution.

[25] https://www.elexon.co.uk/mod-proposal/p391/
[26] https://www.elexon.co.uk/mod-proposal/p375/
[27] https://recportal.co.uk/group/guest/-/complex-sites-process-improvements

Elexon advises that the solution will clarify to MOAs how phase failures should be managed. It will also remove the outdated requirement currently outlined in Section 5.1.3 of CoPs 1 and 2. The Workgroup noted and agreed to the proposed solution.

Elexon raised (on 5 October 2021) and implemented (on 30 June 2022) CP1550 'Updates to monitoring of voltage failure alarms requirements'[28]

Aspect_16 – Obsolete Metering Equipment

Background and Issue

This Aspect was raised and progressed with the intent of mitigating the risk associated with obsolete Metering Equipment.

The Proposer explains that there was evidence to indicate that there are significant numbers of old and 'unsupported' Metering Equipment that are still in use. The BSC does not currently set out which Metering Equipment is supported or not, the Proposer added.

The Proposer requested the Workgroup consider defining what 'unsupported Metering Equipment' means, in the CoPs. Additionally, the Workgroup could look to provide guidance on what actions and engagement are required by industry stakeholders to prevent the use of 'unsupported' Metering Equipment.

Progress and conclusion

The Workgroup discussed this Aspect at the eighth Workgroup meeting. The Workgroup highlighted the need for this requirement to trigger a recognition of a higher risk of failure at end of life and potentially a non-compliance. The exact mechanism for initiating Metering Equipment change was not determined. The Workgroup agreed that at the lower end of the market, Meters are a consumable item and can promptly be replaced on failure. In the higher volume SVA & CVA market, changing Metering Equipment can result in long replacement lead times, as evidenced in recent Trading Disputes. This is a BSC Risk that needs addressing.

Further discussions by the Workgroup led to the following recommendations from Elexon:

- Process to be added to BSCP601 to check and confirm (yearly) where a manufacturer has stopped supporting a Meter type;
- Process to be added to BSCP601 to withdraw a Certificate of Compliance for unsupported Meter/Outstations types;
- Process to be added to BSCP601 to withdraw Protocol Approval where a Data Collector no longer can support an approved Protocol;
- Process to be added to give a transition period to remove unsupported Meter/Outstation types; and
- Raise a Metering Dispensation to allow unsupported Meter/Outstation types to be installed where a fault occurs and the Meter/Outstation type is still in the transition period for removal.

[28] https://www.elexon.co.uk/change-proposal/cp1550/

Elexon confirmed that a CP will be raised after the Issue 93 review concludes, to reflect the recommendations. The Workgroup agreed.

Aspect_17 – Minimum burden requirements for CT ratios vs circuit capacity

Background and Issue

This Aspect was raised and progressed with the intent of defining appropriate CT ratios and specifying a minimum burden in the CoPs.

The Proposer explained that the IEC maintains the standards for measurement transformers in the 61869 suites of standards noting that standards 2 and 3 specify the limits of error. The relevant standards for Settlement are:

- BS EN/IEC 61869-2: Instrument transformers – Part 2: Additional requirements for current transformers;
- BS EN/IEC 61869-3: Additional requirements for inductive voltage transformers; and
- BS EN/IEC 61869-4: Additional requirements for combined transformers.

The Proposer requested that the Workgroup consider what CT ratio should be specified to ensure accuracy of the applicable Metering System.

Progression and conclusion

This Aspect was discussed and debated at the first and third Issue 93 Subgroup meetings, where Elexon explained the background and issue to the Subgroup members.

Further, Elexon outlined some situations where Metering Systems operate outside of the limits of errors specified in both the CoPs and the IEC standards. These situations include:

- Where Metering Equipment is rated for the level of Export but the same Metering System is required for measuring Import and the current is below 1% Ir[29]
- Where a Metering System designer has selected an inappropriate CT ratio for the rated capacity of the circuit or the connected assets (or agreed capacity, if lower than the maximum rating of the connected assets) and the current can drop below 1% Ir;
- Where a site is designed to deliver a Reactive Energy Service and the Active Energy Import is significantly lower than the Reactive Energy flow, and operating at a power factor outside of 0.5 lag to 0.8 lead range; and
- Where an intermittent renewable site (e.g. Photovoltaics) is in the hours of darkness sitting on soak (I.e., Reactive Energy being absorbed) and there is very little Active Energy Import operating at a PF outside of 0.8 lead to 0.5 lag range.

The Workgroup noted these. Elexon initiated the Workgroup discussion to understand the current industry practices, what available future developments might need to be considered in the solution for this Aspect and confirm what the potential solution for this Aspect could be.

Elexon asked the Workgroup to comment on what CT ratio should be specified, to which a few members responded with their views. The following considerations were highlighted by the Workgroup:

[29] 1% Ir referenced based on CP to tighten accuracy classes for CTs to class 0.5S in CoPs 3, 5 and 10 making all CTs subject to testing down to 1% Ir as required by the IEC standard

- The need to refine how the “circuit capacity” in the CoPs is determined;
- The need to confirm the rationale behind the CT ratios that are being used by LDSOs;
- Consider the impact the criteria for an appropriate CT ratio will have on LDSOs, in terms of procuring equipment.

In response to the second point, Elexon took an action to contact LDSOs and confirm what their rationale were for using their current CT ratios respectively.

At the second Subgroup meeting for this aspect, the response to the action was shared with the Workgroup members. The Workgroup noted the rationale from five LDSOs on why they use their respective CT ratios.

Bearing the rationale from LDSOs in mind, the Workgroup further discussed the appropriate CT ratio to specify, what minimum burden needed to be specified in the CoPs, what should the overall accuracy limits be for where prevailing conditions are outside of the limits specified in the relevant CoPs, and if changes to the CoPs should be limited to CoPs 1, 2, 3, 4, 5 and 10.

In conclusion, Elexon provided the below recommendations to the Workgroup:

For minimum burden:
- Add text to the relevant CoPs to provide guidance on what factors need to be considered for choosing a typical burden for Settlement purposes; and
- Align across the CoPs that additional burden can be added to maintain overall accuracy.

For CT ratios:
- CTs should be assigned a ’S’ accuracy class (e.g. 0.5S); and
- A cautionary text will be added to the relevant CoPs to advise where a site can operate outside of specified limits the designer of the Metering System or Registrant should satisfy themselves that Overall Accuracy is still maintained.

The Workgroup noted and agreed to the recommendation. Elexon confirmed that a CP will be raised after the Issue 93 review concludes, to reflect the recommendation.

Aspect_18 – Clarify the Defined Metering Point (DMP) for Low Voltage Supplies

Background and Issue

This Aspect was derived from the Workgroup debate on Aspect 07 ‘Considerations of DMP vs AMP’ at the third Issue meeting.

At the meeting, Elexon asked the Workgroup what the specific DMP for LV supplies in offshore and onshore substations should be, citing a scenario where flows occurred between two Balancing Mechanism Units (BMUs) (e.g. two Offshore Power Park Module (OPPM)). Elexon advised that it may be valuable to ensure that the DMP makes it clear that these flows were metered. The Workgroup recognising that this wasn’t within the scope of Aspect 07, moved to address the question under the new Aspect 18 ‘Clarifying the DMP for LV supplies’.

Progression and conclusion

This Aspect was discussed and debated at the ninth Workgroup meeting. At this meeting, Elexon explained the background covering the current requirements in the relevant CoPs which confirms that the BSC states that the DMP for LV supplies (at Boundary Points) is the

point of connection to the Total System. Also, the BSC issued specific guidance on metering offshore wind farms (as a result of these LV supplies not being metered initially and then being subject to Metering Dispensations).

Elexon proposed two potential solution options to the Workgroup and sought their feedback. Both solution options were:

- Formalising the DMP in Appendix A of the HH CoPs, for LV supplies, as 'point of connection' to the Total System; or
- Formalising the DMP in Appendix A of the HH CoPs, for LV supplies, as 'the low voltage side of the Low Voltage transformer' connected to the Total System.

The Workgroup generally felt that option b was the better option. However, in response to option b, they highlighted an issue with meters not being at the Boundary Point and the addition of the wrong requirement could lead to a Trading Dispute being raised. In response, Elexon verbally presented a third option which the Workgroup agreed to. Elexon took an action to document this option and circulate this with the group for further review.

This additional solution option was:

- Formalising the DMP in Appendix A, for LV supplies, as 'the high voltage side of the Low Voltage supply transformer' connected to the Total System, where the LV supplies transformer is not owned by the Wind Farm Operator (WFO) (or Customer or generator); and
- Formalising the DMP in Appendix A, for LV supplies, as 'the high voltage side of the Low Voltage supply transformer' connected to the Total System, where the LV supplies is owned by the WFO 0or Customer or generator)

Elexon proposed that an issue group is raised (outside of the Issue 93 review) to explore the proposed recommendation. The Workgroup agreed.

Appendix 1: Issue Group Membership

Issue Group membership and attendance

The complete Issue 93 attendance report can be viewed in attachment B of the Issue 93 report.

Name	Organisation
Iain Nicoll	Elexon *(Chair)*
Mike Smith	Elexon (SME)
Christopher Day	Elexon (SME)
Mark DeSouzaWilson	Elexon (DA)
Stanley Dikeocha	Elexon (Lead Analyst)
Lee Walker	Elexon (Metering)
Tom Chevalier	PDA (Proposer)
David Brown	AMO (Proposer's Alternate)
Tony Townley	Honeywell
John Marshall	Scottish Power
Dawn Matthews	UK Power Network (UKPN)
John Greene	SSE
Meg Wong	Stark
Richard Brady	Western Power
Simon Hagan	Imserv
Anthony Hobbs	Siemens
James Murphy	Stark
Nicholas Sawyer	NPower
Dave Siggers	EDF Energy
Roger Sparks	Western Power
Nik Wills	Stark
Stephen Cuddihey	UKPN
Martin Carpenter	National Grid
Kevin Walker	EON Energy
Edward Farley	National Grid
Christopher Herzog	OVO Energy
Allan Sydney	ASL Holdings Limited
Warren Lacey	Northern Powergrid

Peter Rees	Siemens
John Greenwood	Siemens
Matthew Geoff	Imserv
Harriet Truss	Retail Energy Code (REC)
Derik Weaving	Centrica

Appendix 2: Issue 93 Delivery Plan

Aspect	Recommendation	Estimated timeline to raise the change
Aspect 03	Duplicate Communications paths for Metering Equipment within CoPs 1 and 2	Q4 2022 (October – December)
Aspect 07	Consideration of DMP vs AMP	Q4 2022 (October – December)
Aspect 11	Determining the relevant CoP for embedded circuits	Q4 2022 (October – December)
Aspect 04	Calibration checks for Main and Check Meters	Q1 2023 (January – March)
Aspect 08	Measuring elements on neutral and earth conductors	Q1 2023 (January – March)
Aspect 16	Obsolete Metering Equipment	Q1 2023 (January – March)
Aspect 17	Minimum burden requirement and CT ratio vs circuit/agreed capacity	Q2 2023 (April – June)
Aspect 18	Clarify DMP for LV supplies	Q2 2023 (April – June)
Aspect 13	Security of using public IP addresses for Communications to Metering Systems	Q2 2022 (April – June)
Aspect 01	Consolidation of the CoPs	Q3 2023 (July – Sept)