Final CP Report

CP1519 'Treatment of Low Capacity Connections for Site Specific Line Loss Factor Calculations'

ELEXON

Contents

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About This Document

This document is the Change Proposal (CP) 1519 Final CP Report, which ELEXON has published following the final decision from the Imbalance Settlement Group (ISG) and Supplier Volume Allocation Group (SVG) to approve CP1519.

There are six parts to this document:

- This is the main document. It provides details of the solution, impacts, costs, and proposed implementation approach. It also summarises the ISG's and SVG's views on the proposed changes and the views of respondents to the CP Consultation, along with the final decision on whether to approve this change.

- Attachments A-D contain the approved redlined changes to deliver the CP1519 solution.

- Attachment E contains the full responses received to the CP Consultation.

1 Why Change?

Background

Line Loss Factors (LLFs) are values calculated and applied to Metered (and Unmetered) Volumes to account for Distribution losses. Importing sites are normally assigned a LLF value greater than 1, as more energy must be dispatched than required to account for the losses that will occur along the way. Exporting sites are normally assigned a LLF value less than 1 for the opposing reason. Section 3.1 of BSCP128 'Production, Submission, Audit and Approval of Line Loss Factors' lists 17 Principles to be used by Licensed Distribution System Operators (LDSOs) when calculating LLFs that will apply for the forthcoming BSC Year (1 Apr – 31 Mar).

Before implementing new LLF values each BSC Year, ELEXON is required to review LLF methodologies submitted by LDSOs against the BSCP128 Principles, which are then approved by the BSC Panel. Following Panel approval, each LDSO must calculate LLFs in accordance with the approved methodology before submitting to ELEXON. ELEXON then audits the calculations in line with the approved methodologies, for Panel approval.

LLFs are calculated on an individual basis for sites connected at Extra High Voltage (EHV[1]) and at the customer's request where agreed with the LDSO – these are Site Specific LLFs. LLFs for all other connections are based on generic values for the type of Meter in use – these are Generic LLFs.

What is the issue?

There are an increasing number of EHV Sites with a 'main' connection and one or more subordinate[2] small-scale connection. Subordinate connections have low maximum-demand and consumption. If they were single connections in their own right, connected at lower voltage levels, they would have Generic LLFs.

Some (but not all) LDSOs[3] use Power-flow modelling[4] when performing variable losses calculations where maximum demand values are key parameters. Low maximum demand can produce low signal-to-noise ratios during power-flow modelling, which can distort resulting LLF values, increasing their volatility. This adds the risk of misrepresenting the losses' calculation accuracy as well as increasing loss value volatility.

In addition to low maximum demand, subordinate connections often have low (kWh) volumes so associated losses have negligible material significance compared to the energy volumes for the main connection. Due to the potential for distortion in the LLF values, and subordinate connections having comparatively low overall losses, the use of Site-Specific calculations for subordinate connections would not provide any obvious benefits.

Following the LLF audit round for Settlement Year 2018/19, ELEXON hosted its annual 'lessons learned' group with all LDSOs. The group unanimously supported CP1519 being raised.

What is a subordinate connection?
A subordinate connection is often 1 MVA or less, and the majority are ancillary import connections for Generating Plant and Apparatus that may become the Site's only source of import when the 'main' connection is not being used.

An example of a subordinate connection may be a low HV import connection to power aircraft-avoidance lights on wind turbines when the turbine is not generating its own power. Another example may be a small import connection used to 'keep the lights on' when a power Station is not generating electricity to be used on Site.

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[1] BSCP128 requires each LDSO to define EHV for the purpose of calculation of LLF in the LDSO's approved LLF methodology. In most methodology statements, EHV is defined as a nominal voltage of 22,000 volts or above.
[2] Subordinate in this sense is used to refer to a low HV connection that is secondary to the site's main connection. This is used to reflect the language used in LDSO's methodology statements.
[3] Other LDSOs use spreadsheet-based models as part of their LLF calculation methodologies and may not see the same level of distortion. This is entirely at the LDSO's discretion and is not mandated one way or another.
[4] A theoretical model used to predict output flow of energy at certain points within a System

2   Solution

Approved solution

CP1519 will amend Principle 17 in BSCP128, and three of its appendixes to reflect the changes. LDSOs will be able to use a Generic LLF for subordinate connections as a default replacement process as permitted by Principle 17.

LDSOs will be able to choose whether to use Generic LLFs for subordinate connections. If they are used, they will be subject to scrutiny, including auditing, in the same way as any other LLFs.

The new principles will not be available for LLF Calculations already submitted for 2020/21. Once CP1519 is implemented, LLFs can be amended 'in-year' using the methodology in BSCP128.

The new methodology will be subject to an apparent power limit of 1MVA. This value is based on LDSOs' input at the lesson-learned group. It is an industry wide standard volume and is a maximum value regularly seen so is based on industry precedence.

Proposer's rationale

Principle 17 was introduced to BSCP128 by CP1492 'Causes and treatment of large Line Loss Factors' in February 2018. It allows alternative LLF calculation steps for Sites with low consumption in a given Seasonal Time of Day[5] (SToD) period that would otherwise result in high value LLFs. High value LLFs are an exception however, they can occur where energy usage or Export can be low for a given SToD period but the reactive power is high. Although these sites are rare, the growth of embedded Generation means they are becoming more common. Principle 17 was introduced with an expectation that it would be refined following lessons learned, hence CP1519 was raised.

CP1519 will address situations where low consumption and maximum demands potentially result in LLFs that do not reflect the appropriate losses, and where assigning generic LLF values would provide greater consistency and transparency. Subordinate connections tend to have LLF fluctuations that do not have large material impact in absolute terms when compared to the losses for the main Plant and Apparatus e.g. where the main site is a large Power Station. Using Generic LLF values will reduce signal-to-noise volatility and will likely be as reflective as Site-Specific LLFs.

High volume (i.e. EHV) Sites that have subordinate connections with irregular demand between SToD periods, and low consumption volumes, are the type of scenario that were envisaged when Principle 17 was created. The distortions caused by the subordinate connections when power-flow modelling are likely to create high LLF values so, a default replacement process would be required to comply with Principle 17.

Generic LLFs as a default replacement process should only be used when necessary to avoid inaccurate LLFs and not to avoid calculating bespoke LLFs as a Principle 17 default replacement process. This is why the 1MVA apparent power limit has been included.

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[5] SToD distribution losses vary with the time the power is taken by the customer. Typically, there will be LLFs for Day, Night, Summer Day, Winter Day and Winter Peak. SToD periods are specified in the LDSO's methodology statement and are available via the ELEXON Portal.

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Approved redlining

Attachments A-D contain the approved redlined changes to deliver the CP1519 solution.

Housekeeping change

BSCP128 Appendix 1 paragraph 1.3 question 8 will be amended to correct a minor error in the text.

3   Impacts and Costs

Central impacts and costs

Central impacts

CP1519 changes four Code Subsidiary Documents (CSDs). There will be no change to BSC Central Systems.

Central Impacts	
Document Impacts	System Impacts
- BSCP128 – 'Production, Submission, Audit and Approval of Line Loss Factors' - BSCP128 Appendix 1 – 'Methodology of Self Assessment Document (MSAD) for Host LDSOs and Embedded LDSOs that do not Mirror' - BSCP128 Appendix 3 – 'Calculation Self Assessment Document (CSAD) for Host LDSOs and Embedded LDSOs that do not Mirror' - BSCP128 Appendix 10 – 'Calculation Self-Assessment Document (CSAD) for mid-year LLF submissions'	Nil

The LLF Guidance will be updated to reflect CP1519 changes.

Impact on BSC Settlement Risks

Impact on BSC Settlement Risks
Risk 015 'SVA reference data is not created or transferred correctly, or at all' and Risk 026 'Aggregation Rules in CDCA are incorrect such that CVA Metered Data is not correctly aggregated and the energy volumes required for Settlement are incorrect or missing' will be mitigated by allowing LDSOs to improve the accuracy of LLFs

Central costs

The central implementation costs for CP1519 will be approximately £720 (three ELEXON Working Days to implement the necessary document changes).

BSC Party & Party Agent impacts and costs

There will be a minor impact on LDSOs (and embedded LDSOs that do not mirror their host LDSO) if they choose to use the additional methodology but, as use will be optional, so too will be any impacts.

BSC Party & Party Agent Impacts	
BSC Party/Party Agent	Impact
LDSOs	Will need to update their LLF Calculation Methodologies if they opt to use the CP1519 changes
Embedded LDSOs	Will need to update their LLF Calculation Methodologies if they opt to use the CP1519 changes if they do not mirror their Host LDSO

4   Implementation Approach

Approved Implementation Date

CP1519 will be implemented on **27 February 2020** as part of the February 2020 BSC Scheduled Release.

As this change to have minor impact and lead times, CP1519 is being included in the first available Release following its approval.

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5   Initial Committee Views

ISG's initial views

We presented the CP1519 Progression Paper to the Imbalance Settlement Group (ISG) on 23 July 2019 (ISG219/04). We confirmed, in response to a Member's question, that as the planned implementation is after the 2020/21 LLF Calculations have been submitted, LDSOs (and embedded LDSOs where applicable) would be able to adjust their LLFs during 2020/21 using the BSCP128 process. This was clarified in the CP1519 consultation and is referenced above.

ELEXON highlighted the education events in August 2019 to assist with LDSOs' and Embedded LDSOs' understanding of the LLF and Market Domain Data processes.

SVG's initial views

We presented the CP1519 Progression Paper to the SVG on 6 August 2019 (SVG 222/03). The SVG Progression Paper included the ISG's initial views, to which the SVG offered no further comment.

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This section summarises the responses received to the CP Consultation. You can find the full responses in Attachment E.

Summary of CP1519 CP Consultation Responses				
Question	Yes	No	Neutral/ No Comment	Other
Do you agree with the CP1519 proposed solution?	5	0	0	1
Do you agree that the draft redlining delivers the intent of CP1519?	3	2	0	1
Will CP1519 impact your organisation?	2	4	0	0
Will your organisation incur any costs in implementing CP1519?	0	6	0	0
Do you agree with the proposed implementation approach for CP1519?	6	0	0	0
Do you have any further comments on CP1519?	2	4	-	-

One correspondent only agreed with the CP1519 proposed solution dependent on their recommended amendments being accepted. They suggested redlining amendments (see below) and that Principle 8 should be amended so to require Site-Specific LLFs to have, as a minimum, Day and Night LLFs. This was consulted on as part of CP1492, but not implemented, as it would cause further issue in terms of resource requirements and LLF calculation complications, as explained in the CP1492 Final CP Report. Further, it could, potentially, affect consumer behaviour e.g. if the difference in LLFs between night and day were notable, then time of Generation and/or consumption could change, thereby negating the accuracy of the LLF as they are based on historic consumption averages. Amending Principle 8 is outside the scope of CP1519, and has therefore not been amended as part of this CP.

Two respondents noted impacts. One as they will need to introduce a new procedure (which tallied with ELEXON's initial assessment) and the other noted a positive impact, as it will aide their LLF calculations.

Comments on the proposed redlining

Use of Generic LLFs for certain SToDs

One respondent suggested that provision should be added for scenarios where the power flow is less than 1MVA only during certain SToDs. They suggested that a Generic LLF could be used during these SToDs, but Site Specific LLFs used at other times.

The LLF Principles already allow LDSOs to take this approach, though we understand that it may not be commercially practicable to have multiple LLFs for a single Metering System, and therefore, did not think BSCP128 would benefit from this amendment. However, we have added a footnote to the Principles to explain that this scenario is allowed.

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Meaning of Site and connection

There was concern that there is potential for ambiguity around 'connection' and the relationship between 'primary' and 'subordinate' connections.

Site, in the context of LLFs has the same meaning as described in BSC Section K 'Classification and Registration of Metering Systems and BM Units' paragraph 1.6. BSC Section X-2 'Technical Glossary' describes Site Specific LLFs as 'A Line Loss Factor established for a single Metering System as provided in Section K1.7.2'.

BSC Section K1.7.2 states that 'Line Loss Factors may be established for a single Metering System or for a class (of a description specified by the Licensed Distribution System Operator) of Metering System'. BSC Section X-1 'General Glossary' states that Metering System 'means particular commissioned Metering Equipment, subject to and in accordance with Section K1.6' and K1.6.2 defines 'Site' for the purpose of K1.6.1 (amongst others).

BSC Section K1.6.2(a) states that a Site can be considered as: 'a location containing one or more Boundary Points (other than Interconnector Boundary Point(s)) and at which there is situated:

    i.   a single Generating Plant; or

    ii.   a single set of premises; or

    iii.   any combination of one or more Generating Plants and/or sets of premises which may, in the CDCA's reasonable opinion (having regard, among other things, to their physical proximity), be considered to be managed as a single site; or

    iv.   any other collection of Plant or Apparatus which the CDCA approves for these purposes (on a case by case basis) consistent with the principles in paragraphs (i), (ii) and (iii);

BSC Section K1.6.1 describes how the composition of a Metering System shall be determined and therefore Site Specific LLFs. K1.6.1 allows multiple Metering Equipment at a Site for the purposes of measuring Exports and Imports at multiple Boundary Points to be considered a single Metering System.

Therefore, in the context of the amendment to Principle 17, where a Site has two Boundary Points and therefore two sets of Metering Equipment that are considered a single Metering System, it is reasonable that a single Site Specific LLF **could** be applied to all Boundary Points.

However, to satisfy K1.6.1(a), K1.6.1(d) must also be satisfied. K1.6.1(d) states that where a Metering System is to be registered in SMRS (as subordinate connections would be), Metering Equipment shall be considered a single Metering System. This means that each separate Boundary Point connection will have its own MSID and Principle 17a and 17b will not be required. This means, prima facia, that there is no need for CP1519.

CP1519 aims to provide guidance and direction on when it would be appropriate to use the Principle 17 default replacement process. The redlining is worded such that where a Site has multiple connections, a Generic LLF **MAY** be used (i.e. it is optional). Principle 17 already allows this but, there is some confusion over the threshold for when a Generic LLF can be used as a default calculation, or default replacement process as opposed another type of default replacement process or calculation e.g. calculating a bespoke LLF for that Site.

The LLF guidance document will be update to reflect this and provide clarity.

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Comments on the CP1519 Proposed Redlining		
Document & Location	Comment	ELEXON's Response
BSCP128 paragraph 3.1	A third scenario should be added to the redlined text in BSCP128 section 3.1.17 along the lines of; "(c) Where analysis of the actual meter data for a site shows that the average power flow is less than 1 MVA during a particular SToD then the generic value for that voltage level will be applied for that power flow direction for that site for that SToD".	Footnote added to clarify as described above. 'If a connection is at EHV due to the Import/Export capacity associated with its primary purpose but, a much lower Import/Export capacity is also required for secondary purposes, which would be a non-EHV connection if considered in its own right, this default replacement process **MAY** also apply e.g. a single Metering System with separate Import and Export MSIDs'
BSCP128 paragraph 3.1	'A Site has multiple connections to the Total System and the primary connection is at EHV but there is a subordinate connection that is not connected at EHV, then a generic methodology MAY be used for the subordinate connection (even if a Site specific LLF is used for the Site's primary connection as per Principle 1)' Alternative understanding: If a connection to a customer is at EHV, due to the import/export capacity associated with its primary purpose, but a much lower import/export capacity is also required for secondary purposes, which could independently warrant a non EHV connection... then a generic methodology MAY be used for the lower capacity LLF. I agree with the 1 MVA limit.	Footnote added to clarify as described above. 'In this context, Site has the meaning given to it in BSC Section K 1.6'. As described above, the LLF guidance will also be updated.
BSCP128 paragraph 3.1	The draft redlining adds a new a) & b) but does not make clear whether these are joined by 'and' or 'or', so does one condition have to be true or both? I think the join should be 'and' to require both conditions to be true.	The word 'and' has been added

Comments on the CP1519 Proposed Redlining		
Document & Location	Comment	ELEXON's Response
BSCP128 Appendix 3 paragraph 1.3.16	In Appendix 3 the additional text includes the term 'may' this should be replaced with 'shall'.	Providing a line diagram (which 'may' refers to) is optional elsewhere and the proposed redlining reflects this, therefore not change made.

7   Final Committee Views and Decision

ISG's final views

We presented the CP1519 Assessment Report to the ISG at its meeting on 17 September 2019 (ISG221/05).

The ISG **unanimously** approved CP1519 for implementation on 27 February 2020, and made no other comments.

SVG's final views

We presented the CP1519 Assessment Report to the SVG at its meeting on 8 October 2019 (SVG 224/04).

The SVG **unanimously** approved CP1519 for implementation on 27 February 2020, and made no other comments.

Final decision

The ISG and SVG:

- **AGREED** the amendments to the redlining to BSCP128 following CP Consultation;

- **APPROVED** the changes to BSCP128, BSCP128 Appendix One, BSCP128 Appendix Three and BSCP128 Appendix Ten for CP1519; and

- **APPROVED** CP1519 for implementation on 27 February 2020 as part of the February 2020 BSC Release.

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Appendix 1: Glossary & References

Acronyms

Acronyms used in this document are listed in the table below.

Acronyms	
Acronym	Definition
BSCP	Balance and Settlement Code Procedure
CPC	Change proposal Consultation
CSAD	Calculation Self-Assessment Document
CSD	Code subsidiary Document
EHV	Extra High Voltage
ISG	Imbalance Settlement Group
LDSO	Licensed Distribution System Operator
LLF	Line Loss Factor
MSAD	Methodology Self-Assessment Document
MVA	Mega Volt-Amperes
SToD	Seasonal Time of Day
SVG	Supply Volume Group

External links

A summary of all hyperlinks used in this document are listed in the table below.

All external documents and URL links listed are correct as of the date of this document.

External Links		
Page(s)	Description	URL
2	Balancing and Settlement Code Procedure (BSCP) 128 'Production, Submission, Audit and Approval of Line Loss Factors'	https://www.elexon.co.uk/bsc-related-documents/related-documents/bscps/?show=all
3	CP1492 'Causes and treatment of large Line Loss Factors'	https://www.elexon.co.uk/change-proposal/cp1492/
4	'Production, Submission, Audit and Approval of Line Loss Factors'	https://www.elexon.co.uk/csd/bscp128-production-submission-audit-and-approval-of-line-loss-factors/
4	Methodology Self Assessment Document (MSAD) for Host LDSOs and Embedded LDSOs that do not Mirror	https://www.elexon.co.uk/csd/bscp128-appendix-1-methodology-of-self-assessment-document-msad-for-host-ldsos-and-embedded-ldsos-that-do-not-mirror/

External Links		
Page(s)	Description	URL
4	Calculation Self Assessment Document (CSAD) for Host LDSOs and Embedded LDSOs that do not Mirror	https://www.elexon.co.uk/csd/bscp128-appendix-3-calculation-self-assessment-document-csad-for-host-ldsos-and-embedded-ldsos-that-do-not-mirror/
4	Calculation Self Assessment Document (CSAD) for mid year LLF submissions	https://www.elexon.co.uk/csd/bscp128-appx-10-calculation-self-assessment-document-csad-mid-year-llf-submissions/
9	ISG 219 Webpage	https://www.elexon.co.uk/meeting/isg219/
9	LLF Education days	https://elexonexternal.newsweaver.com/1gmbg04lik/ttsriy1d3jl5lg80pc2kc3?email=true&a=1&p=355071&t=74531
9	SVG 222 Webpage	https://www.elexon.co.uk/meeting/svg222/
10	BSC Sections (various)	https://www.elexon.co.uk/bsc-and-codes/balancing-settlement-code/
13	ISG 221 Webpage	https://www.elexon.co.uk/meeting/isg221/
13	SVG 224 Webpage	https://www.elexon.co.uk/meeting/svg224/