

CP Assessment Report

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

ELEXON



Committee

Supplier Volume Allocation Group (SVG)

Recommendation

Approve

Implementation Date

27 February 2020
(February 2020 Release)



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About This Document

This document is the Change Proposal (CP) Assessment Report for CP1519, which ELEXON will present to the Supplier Volume Allocation Group (SVG) at its meeting on 8 October 2019. The SVG will consider the proposed solution and the responses received to the CP Consultation before making a decision on whether to approve CP1519. CP1519 was approved by the Imbalance Settlement Group (ISG) on 17 September 2019.

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 and SVG's initial views on the proposed changes and the views of respondents to the CP Consultation as well as the ISG's final views.
- Attachments A-D contain the proposed 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 (EHV¹) and at the customer's request where agreed with the LDSO and on a generic basis for all other connections.

What is the issue?

There are an increasing number of EHV Sites with a 'main' connection and one or more subordinate² small-scale connection. Subordinate connections have low maximum demand and consumption and, if they were single connections in their own right, would be connected at lower voltage levels with generic LLFs.

Some (but not all) LDSOs³ use Power-flow modelling⁴ 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 and 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 the 2018/19 Settlement Year ELEXON hosted its annual 'lessons learned' group with all LDSOs. The lessons learned group gave unanimous support to this CP 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

Proposed solution

CP1519 proposes to amend Principle 17 in BSCP128, and three of its appendixes to reflect the changes, so that LDSOs can use a generic LLF for subordinate connections as a default replacement process as permitted by Principle 17.

The use of generic LLFs for subordinate connections will be optional for LDSOs but, if used, subject to scrutiny, including auditing, in the same way as any other LLF methodology.

We acknowledge that the change will not be available for LLF Calculations being submitted this summer for 2020/21 but, once CP1519 is implemented, LDSOs may use it to amend LLFs 'in-year' using the methodology in BSCP128.

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

Proposer's rationale

[CP1492 'Causes and treatment of large Line Loss Factors'](#) introduced Principle 17 to BSCP128 in February 2018. Principle 17 was introduced to allow alternative LLF calculation steps for Sites with low consumption in a given Seasonal Time of Day⁵ (SToD) period that would result in high LLFs otherwise. High value LLFs are an exception, however, they can occur on generation/demand sites where energy usage or Export can be low for a given SToD period, but the reactive power is high. These sites are rare but are becoming more common with the growth of embedded Generation.

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. The use of Generic LLF values would reduce signal-to-noise volatility and are likely to be as reflective as Site-Specific LLFs.

High volume (i.e. EHV) Sites with 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. Given the distortions caused by the subordinate connections when power-flow modelling, the distortion is likely to create high LLF values and therefore a default replacement process would be required to comply with Principle 17.

It is essential that generic LLFs as a default replacement process be only used when necessary to avoid inaccurate LLFs and not to simply avoid calculating bespoke LLFs as a default replacement process as allowed in Principle 17. For that reason, the apparent power limit is being proposed as part of the solution.

The expectation in drafting Principle 17 was always that it would be refined following lessons learned activities, which have given rise to this CP.

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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.

Proposed redlining

Attachments A-D of this paper set out the proposed redlined changes to deliver the CP1519 solution.

Housekeeping change

As we are updating BSCP128 Appendix 1, we will use the opportunity to make a housekeeping change to paragraph 1.3 question 8. This will correct a minor error in the text.

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3 Impacts and Costs

Central impacts and costs

Central impacts

CP1519 will require changes to four Code Subsidiary Documents (CSDs):

Central Impacts	
Document Impacts	System Impacts
<ul style="list-style-type: none">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’	<ul style="list-style-type: none">Nil

In addition to the four CSDs, the LLF Guidance note will also need updating.

CP1519 will not impact BSC Central Systems, as it is a procedural document only change.

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 somewhat by allowing LDSOs the ability 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

We envisage some minor impact on LDSOs (and embedded LDSOs that do not mirror their host LDSO) if they elect to use the additional methodology. This will be on a voluntary basis so; if they feel the impact and costs are too high, there is no obligation on them to implement this.

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BSC Party & Party Agent Impacts

BSC Party/Party Agent	Impact
LDSO	May need to update their LLF Calculation Methodologies
Embedded LDSOs	May need to update their LLF Calculation Methodologies if they do not mirror their Host LDSO

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4 Implementation Approach

Recommended Implementation Date

CP1519 is proposed for implementation on **27 February 2020** as part of the February 2020 BSC Scheduled Release.

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

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ISG's initial views

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

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 thoughts.

6 Industry Views

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 be amended so Site-Specific LLFs should also have, as a minimum, Day and Night LLFs. This concept was previously consulted upon 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 tallies with ELEXON's initial assessment) and the other noted a positive impact, as it will aid their LLF calculations.

Comments on the proposed redlining

Use of Generic LLFs for certain STODs

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

There is nothing within the LLF Principles that prevents a LDSO from taking this approach (though we understand that it may not be commercially practicable to have multiple LLFs for a single Metering System) and therefore, do not think the proposed draft redlining

would benefit from being amended. However, we have added a footnote to the Principles to explain the scenario described here is allowed.

Meaning of Site and connection

One respondent raised concern that there is potential for ambiguity over what is meant by 'connection' and the relationship between 'primary' and 'subordinate' connections. For clarification, Site, in this context 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 proposed amend to BSCP128 paragraph 3.1.17, 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 the subordinate connection here would be), Metering Equipment shall be considered a single Metering System. This means that the separate connections will each have their own MSIDs and therefore, Principle 17a and 17b would not be required.

This means that prima facia there is no need for CP1519. But, the aim of CP1519 was to provide some guidance and direction on where it would be appropriate to use the default replacement process as described in Principle 17 and the wording is such that where a Site has multiple connections then a Generic LLF **MAY** be used (i.e. it is optional) if it less than 1 MVA. This is already permitted within the existing Principle 17 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 intent and provide clarity.

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	The word ‘and’ has been added

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Comments on the CP1519 Proposed Redlining		
Document & Location	Comment	ELEXON's Response
	should be 'and' to require both conditions to be true.	
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.

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7 Final Committee views and decision

ISG's final views

The CP1519 Assessment Report was presented 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.

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8 Recommendations

We invite the SVG to:

- **AGREE** the amendments to the proposed redlining to BSCP128 made following CP Consultation;
- **APPROVE** the proposed changes to BSCP128, BSCP128 Appendix One, BSCP128 Appendix Three and BSCP128 Appendix Ten for CP1519; and
- **APPROVE** CP1519 for implementation on 27 February 2020 as part of the February 2020 BSC Release.
- **NOTE** that the ISG approved CP1519 for implementation on 27 February 2020 at its meeting on 17 September 2019.

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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/

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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/

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