Stage 03: Attachment A: Detailed Assessment for P270

P270: The Application of Line Loss Factors to GSPs that are not Transmission-interconnected

What stage is this document in the process?

01 Initial Written Assessment

02 Definition Procedure

03 Assessment Procedure

04 Report Phase

Contents

About this document:

This is Attachment A to the P270 Assessment Report. This attachment provides additional detail, including details of the Workgroup's discussions.

Any questions?

Contact:
Dean Riddell

dean.riddell@elexon.co.uk

1 Background

Line Loss Factors

A Line Loss Factor (LLF) is an adjustment factor applied to readings from a Metering System to adjust for electrical losses occurring on a Distribution System. At present an LLF may only be applied to Metering System at a Boundary Point. The aim is to calculate an associated amount of energy at the Transmission System Boundary for use in Settlement. LLFs are covered by Section K of the BSC and BSC Procedure (BSCP) 128 'Production, Submission, Audit and Approval of Line Loss Factors'.

Licensed Distribution System Operators (LDSOs) calculate LLFs and submit them to ELEXON annually. LDSOs must calculate the LLFs in accordance with an LLF methodology that complies with the principles set out in BSCP128.

Grid Supply Points

Grid Supply Points (GSPs) are also covered in Section K. Section X of the BSC defines a GSP as 'a Systems Connection Point at which the Transmission System is connected to a Distribution System and includes an Offshore Transmission Connection Point'. Each GSP is the responsibility of a Distribution System Operator, who must ensure Metering Equipment is in place and registered, except that the Transmission Company (National Grid) is responsible (as NETSO) for all Offshore Transmission Connection Points.

A GSP is a Systems Connection Point, not a Boundary Point between the Total System (of Transmission and Distribution) and an end user. As such, an LLF may not currently be applied to a Metering System at a GSP.

Offshore Transmission Connection Points

Under the Offshore Transmission Owner (OFTO) arrangements, offshore networks at 132kV or higher became part of the Transmission System (or, in the case of existing networks, will become Transmission System when so designated). Where such a network connects to an onshore Distribution System, the connection is known as an Offshore Transmission Connection Point. Offshore Transmission Connection Points are a type of GSP, and as such cannot presently be assigned an LLF.

Prior to the OFTO arrangements, an LLF calculated by the Distribution System Operator would be applied to a connection between an offshore generator and an onshore Distribution System. Under the OFTO arrangements, metering at the Offshore Transmission Connection Point is CVA registered by the Transmission Company and no LLF is applied.

What is the Issue?

P270 contends that differences between different types of GSPs exist due to the OFTO arrangements, and the BSC arrangements do not recognise these differences. The Proposer believes that this results in some types of GSP being treated in a manner that does not reflect their physical characteristics.

In particular, P270 focuses on the assignment of LLFs, and argues that the characteristics and situation (geographically and in network terms) of some GSPs, such as Offshore Transmission Connection Points, means that it would be appropriate to apply LLFs to them.

In the case of Offshore Transmission Connection Points this would amount to maintaining the pre-OFTO status quo by continuing to apply LLFs to them. The effect on LLFs

Line Loss Factor

A multiplier applied to data from a Metering System connected to a Boundary Point of a Distribution System to convert it to an equivalent value for the Transmission System Boundary.

Grid Supply Point

A point where the Transmission System (including an Offshore Transmission System) is connected to a Distribution System.

Offshore Transmission Connection Point

A GSP that connects an Offshore Transmission System to an (onshore) Distribution System.

assigned to other Metering Systems in the Distribution System is also relevant, since the effect of the now-Offshore Transmission Connection Points on Distribution System losses would previously have been taken into account in calculating LLFs for other Metering Systems.

Interconnected Transmission System and remote connections

The Proposer argues that there is a fundamental difference between the (onshore) interconnected Transmission System and a remotely connected part of the Transmission System (i.e. not interconnected directly with other parts of the Transmission System). An Offshore Transmission System connected to a Distribution System is an example of the latter, and are used here to illustrate this difference.

P270 contends that a conventional onshore GSP has no LLF because it effectively acts as an infinite energy source/sink to the Distribution System Operator, i.e. required energy flows at the boundary (the GSP) are achieved by the addition or reduction of despatched generation from the interconnected Transmission System. In other words, the Transmission System does not carry out activities that by their nature increase or decrease losses on the Distribution System; it responds to the Distribution System's energy requirements.

However, an Offshore GSP (an Offshore Transmission Connection Point) could be considered to join an offshore Transmission System to the main Transmission System via a Distribution System. P270 argues that such an Offshore GSP effectively drives energy across a Distribution System in one direction only, either causing or reducing losses on the Distribution System (depending on the interaction with the other Distribution System elements).

The Proposer believes that from the perspective of the Distribution System Operator, the behaviour of such an Offshore GSP is more akin to that of a Distribution System user, whose Metering System would receive an LLF representing an increase or reduction in Distribution System losses, than a 'normal' GSP connected to the interconnected Transmission System. P270 contends that LLFs should also therefore be applied to Offshore GSPs, and similarly remote connection points to the Transmission System (which would be collectively classed as Remote GSPs under P270).

Impact of the issue

The Proposer believes that it is appropriate in principle to apply LLFs to some GSPs, as discussed above. In terms of material impact, P270 contends that the identified issue unjustifiably distorts LLFs applied on an affected Distribution System.

General Effect

The P270 issue might have a significant effect on sites where site-specific LLFs are calculated on an interactive basis (see below). It has a less pronounced effect on other sites connected to the Distribution System which are allocated generic LLFs, as they share expected residual losses according to the LLF methodology.

If the connection of a site previously assigned an LLF becomes an Offshore Transmission Connection Point the Distribution System losses are the same as before application of the OFTO arrangements, but losses previously covered by the site's LLF are smeared across other sites in the Distribution System. This could affect Generic and Site Specific LLFs within the GSP Group and/or impact the Group Correction Factor.

Under P270, loss adjustments corresponding to losses previously associated with an offshore generator that was (or would have been) connected directly to a Distribution System prior to the OFTO arrangements would be allocated to Transmission Losses and shared by all Transmission users. Under the baseline, without P270, such losses would be shared between some or all other users of the relevant Distribution System by either impacting the applicable LLFs or via GSP Group Correction for NHH sites.

Interactively Determined LLFs

If multiple Extra High Voltage sites (requiring site-specific LLFs) are connected such that their LLFs are calculated on an interactive basis then the identified issue can have a pronounced and local impact. Prior to the OFTO arrangements all the sites involved in such a situation would be assigned Site Specific LLFs, calculated to share the losses between the sites as determined by the Distribution System Operator.

If one or more of the sites in such a situation is affected by the OFTO arrangements the LLFs of any sites that remain outside the OFTO arrangements may be affected, although neither the physical network, the characteristics of the sites nor the physical losses arising on the Distribution System are changed. The Proposer believes that this is inappropriate, and also considers that the principle of the issue remains the same whether the LLFs involved are greater than or less than one, though this has a bearing on the practical effect.

Losses Incentive

The Proposer suggests that the impact on LLFs as a result of an LLF not being applied to an Offshore Transmission Connection Point could potentially have a direct financial impact on the Distribution System Operator under the Losses Incentive (Charge Restriction Condition 7 of the DNO Licence). This is outside the scope of P270, but was noted by the group.

2 Terms of Reference

P270 Terms of Reference		
The P270 Workgroup comprised members of the Settlement Standing Modification Group. The group considered the following areas:		
Ref	Area	Page ref
1	Development of the P270 Proposed solution	6
2	Any alternative solutions	n/a
3	Implementation approach	Main report
4	Assessment against the Applicable BSC Objectives	Main report
5	Materiality of the issue identified by P270	15
6	Quantification of P270 costs and benefits	15, 22
7	Environmental effects of P270	n/a
8	Impact on industry participants	22
9	Consistency with wider industry arrangements	12
10	Impact on Transmission Losses	13

3 Illustrative example of P270 solution

In order to illustrate the effect of the P270 solution and how it would work at a high level, this section sets out an example of a simple arrangement of an offshore generator connected to a Distribution System, and compares the outcomes under different circumstances. The example is considered under:

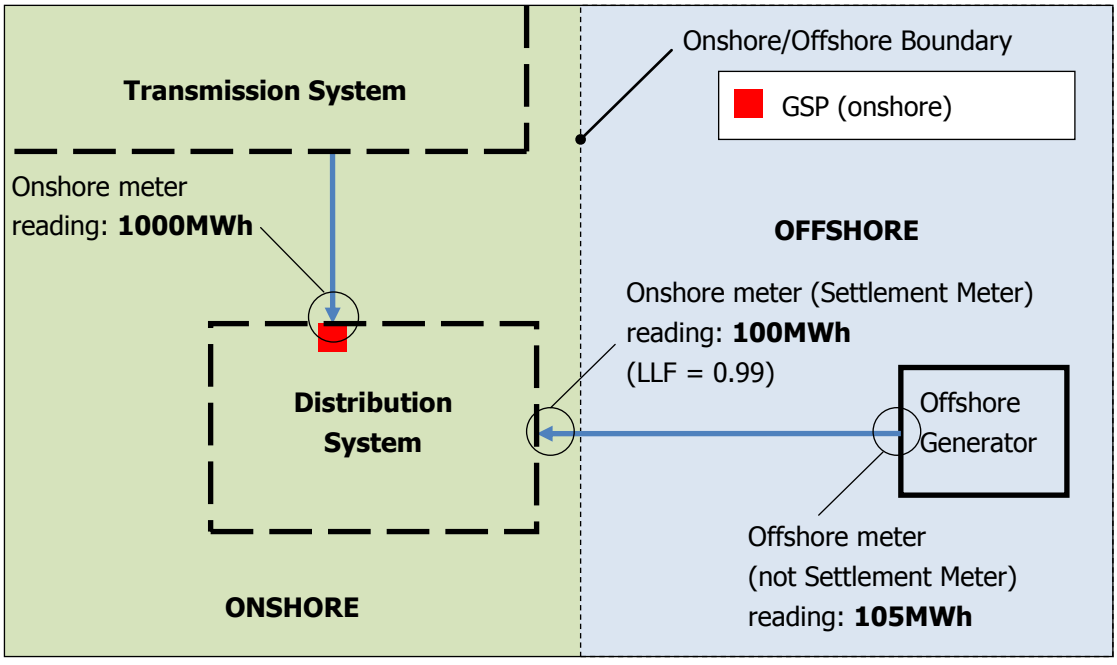
- The situation prior to introduction of the OFTO arrangements;
- The current baseline arrangements; and
- The P270 arrangements.

Note that this is a simplified example and the volumes of energy and other quantities are not intended to be realistic or representative of the actual materiality of the issue. The example shows the situation with an LLF of less than one applied, whereas application of LLFs greater than one is possible and would affect the practical implications for the relevant participants.

This example is therefore intended only to demonstrate the effect that the assignment, or not, of LLFs to GSPs whose connection to the Transmission is relatively remote (e.g. an Offshore Transmission Connection Point) can have on overall Transmission Losses, GSP Group take and other sites' LLFs.

Pre-OFTO Arrangements

Prior to the introduction of the OFTO arrangements, the offshore/onshore connection in the example was the responsibility of the offshore generator, and the Settlement Metering was located onshore. For Settlement purposes, the generators output was its net output (output at the offshore platform minus losses over the offshore/onshore connection) multiplied by the LLF determined by the Distribution System Operator. In this example the LLF is less than one, meaning the generator is considered to cause losses on the Distribution System, so its output is scaled down to take this into account.



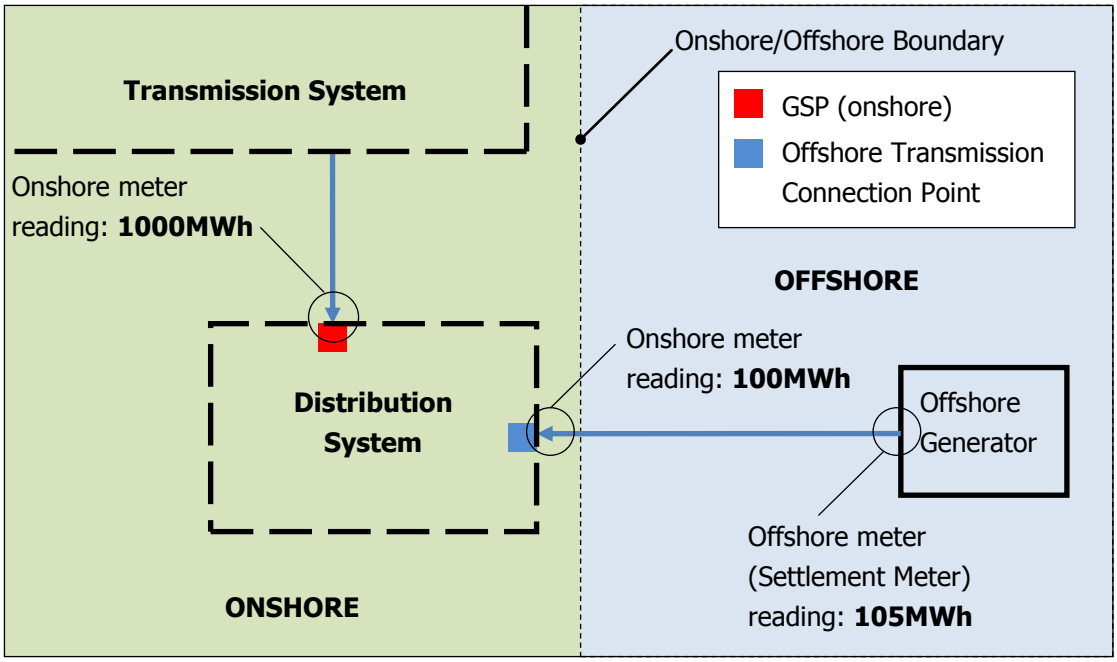
In physical energy terms, the Distribution System receives 1100 MWh, made up of 1000 MWh from the Transmission system via a normal onshore GSP and 100 MWh from the offshore generator. However, the generator's energy is subject to its assigned LLF, in this case 0.99. In this example the generator is registered in CVA, therefore the GSP Group take is 1099 MWh (if it is SVA registered the GSP Group take would be 1000 MWh).

Distribution System losses considered to be associated with the offshore generator are allocated to the generator itself via assignment of an LLF to it. There is no impact on Transmission Losses.

Current Arrangements

The current baseline includes the OFTO arrangements (though they are not yet applied in all relevant situations) which means that the connection between the offshore generator and the onshore Distribution System is part of the Offshore Transmission System and as such is the responsibility of National Grid (as NETSO). The point where the Offshore Transmission System connects to the Distribution System is an Offshore Transmission Connection Point, which is a GSP and therefore not given an LLF.

The Settlement Meter for the offshore generator is located at the offshore platform (unless a dispensation is in place enabling it to be located elsewhere) and the generator's full output at that point is assigned to it for the purposes of Settlement.



The energy lost between the offshore generator and the onshore meter at the Offshore Transmission Connection Point contributes to the national total Transmission Losses (as with losses on any other part of the Transmission System). The onshore reading at the Offshore Transmission Connection Point is not adjusted by the application of an LLF.

Physically, the Distribution System still receives 1100 MWh, made up of 1000 MWh from the Transmission system via a normal onshore GSP and 100 MWh from the Offshore Transmission Connection Point. Neither is subject to loss adjustment by an LLF, but the Offshore Transmission Connection Point is registered in CVA, so the GSP Group take is 1100 MWh.

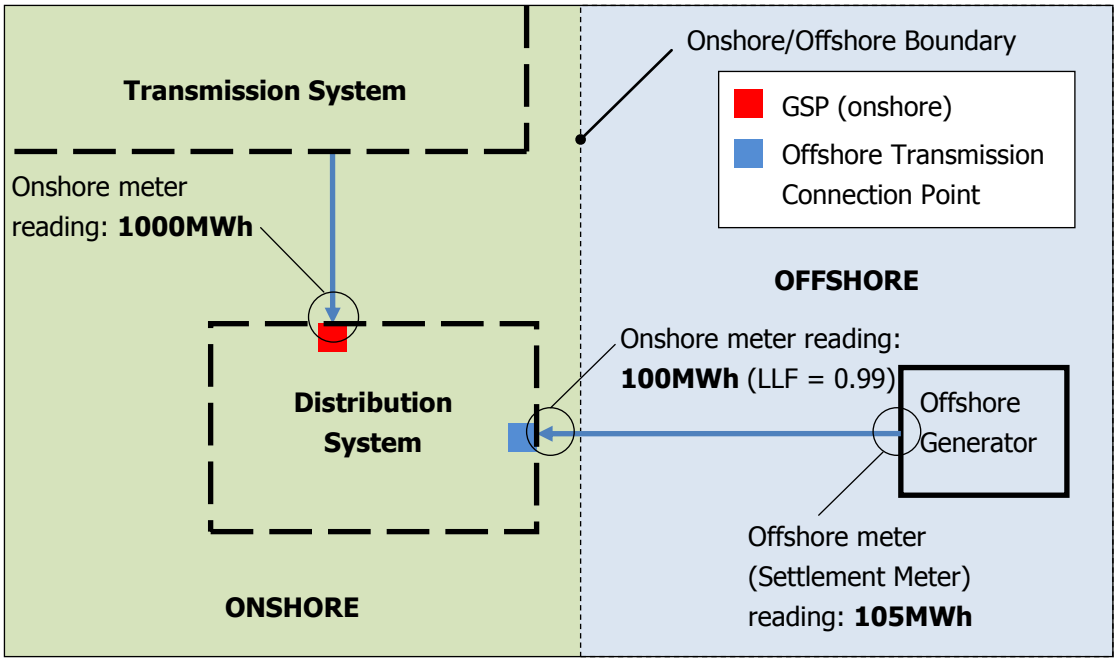
The offshore generator is no longer subject to Distribution System loss adjustment via LLF assignment. Any Distribution System loss that would previously have been considered to be associated with the generator's output is allocated between other Distribution System users; there is no impact on national Transmission Losses.

P270 Solution

Under P270 an LLF would be assigned to the Offshore Transmission Connection Point. Since it is based on the same network characteristic and losses it would be the same as that applied to the offshore generator's delivered volumes under the pre-OFTO arrangements, i.e. 0.99.

P270 would include in the total Transmission Losses the increase (in this example) of Distribution Losses caused by the energy flowing onto the Distribution System from the OFTO network. Because the energy metered onshore is adjusted down by the LLF of 0.99 the calculated Transmission Losses across the onshore/offshore connection is increased compared with that under the baseline (from 105 – 100 = 5MWh to 105 – 99 = 6MWh).

The status of the offshore generator is not affected at all (other than through its share of the effect on Transmission Losses). Its metered volume remains the same as under the current baseline, and it would not be allocated any distribution losses. Its treatment remains equivalent to that of other directly connected generators.



The only effect which would in any way impact the generator is that (like all BM Units) their TLM values would change slightly due to the very small difference in the national total of Transmission Losses (in this example the additional 1MWh).

Comparison

The effects described above are tabulated below. It can be seen that across the three scenarios the energy physically delivered to the Distribution System does not change.

Example parameters under various arrangements			
	Pre-OFTO	**Baseline**[1]	**P270**
Import from main, onshore Transmission System	1000 MWh	1000 MWh	1000 MWh
Import from offshore generator	100 MWh	100 MWh	100 MWh
Total energy delivered to Distribution System	1100 MWh	1100 MWh	1100 MWh
LLF applied to offshore/onshore connection	0.99	None (i.e. 1.00)	0.99
OFTO system contribution to Transmission Losses	Zero	5 MWh	6 MWh
Generator's Settlement Metered Volume	99 MWh	105 MWh	105 MWh
GSP Group Take	1099 MWh[2]	1100 MWh	1099 MWh

Under the baseline (i.e. with the OFTO arrangements) the generator is not directly responsible for losses over the offshore circuits between the generator and Distribution System because this connection is now Transmission System and as such these losses are now considered Transmission Losses. The generator's metered volume for Settlement does not therefore include the losses on the connection, and increases accordingly.

However, it is also apparent that the introduction of the OFTO arrangements into the baseline affects the GSP Group Take. In this example this would have a diluted effect on all sites in the Distribution System, but in different circumstances could also have an impact on a few particular sites, via their assigned LLFs. If other users' LLFs do not change the impact would affect the GSP Group Take, but if LLFs of other users change GSP Group Take may be unaffected.

Under the P270 Proposed solution the offshore generator's metered volume remains the same as under the baseline but the GSP Group Take is restored to its previous value by the application of an LLF to the onshore/offshore connection. The contribution of the OFTO system to Transmission Losses is conversely affected, in this example increasing.

The Proposer believes that these effects are justified by the characteristics of the network arrangements and reflect a cost reflective allocation of energy volumes to the participants involved.

[1] Baseline is post-OFTO and pre-P270.
[2] Assuming (for the purposes of this example) that the Generator is CVA-registered.

4 P270 Legal Text

P270 concerns the application of LLFs to particular types of GSP, and does not directly affect the application of LLFs relating to Boundary Points. The two main aspects of the P270 solution are:

- Introduce a distinction between GSP types based on how they are connected to the Transmission System; and
- Enable LLFs to be assigned to appropriate GSP types.

Changes to BSC Sections K and X are proposed to support this approach. The changes are detailed in Attachment A. This section explains the intent of the changes and how they are intended to deliver the P270 Proposed Solution.

The group considered using the term 'Interconnected' in the text (e.g. Interconnected Transmission System, etc) but felt that this might be potentially confusing given the provisions in the BSC relating to Interconnectors and the use of the term 'Main Interconnected Transmission System' (MITS) in the Transmission Charging Methodology (which has a similar intent, but is not equivalent to, the P270 term). The group therefore agreed to use the term 'contiguous' to describe a network being interconnected in the sense intended by P270 on the basis that they believed this would be clearer.

Section K, Classification and Registration of Metering Systems and BM Units

Amend K1.7.3 so it is clear that LLFs associated with Remote Grid Supply Point are not intended to be excluded from this provision by the P270 solution. Also add words to reflect the definitions added by P270.

Section X, Definitions and Interpretation

- **Annex X-1, General Glossary**

  Add definitions of:

  1. **Contiguous Transmission System:** to specify a subset of the overall Transmission System which is the 'main' Transmission System by reference to the number of GSP Groups to which a network is connected by unbroken Transmission Assets. The intent is that isolated parts of the Transmission System which are subject to the P270 provisions are not captured by this definition;
  2. **Contiguous Transmission System Boundary:** to define where a boundary is part of the 'main' system by building on the first new definition, above. The wording reflects the existing Transmission System Boundary definition (which remains in the BSC); and
  3. **Remote Grid Supply Point:** this is the type of GSP that will fall under the P270 provisions, i.e. will be able to have a LLF applied to it.

- **Annex X-2, Technical Glossary**

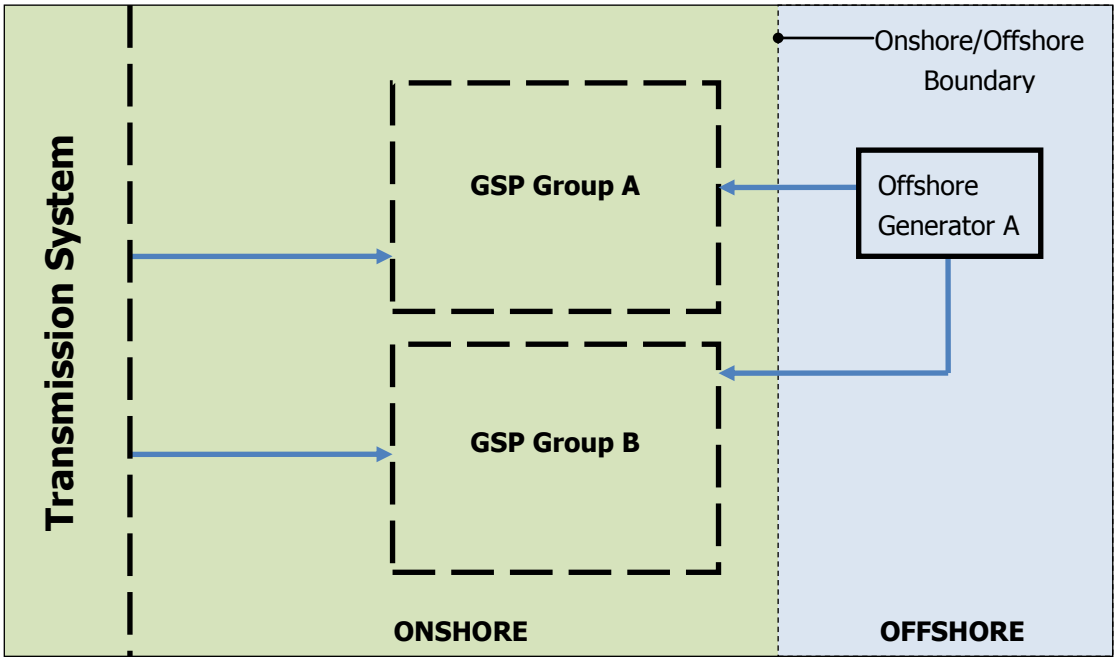
Amend the definition of CVA Line Loss Factor to extend it to cover Remote Grid Supply Points. The new provision applying to Remote Grid Supply Points will reflect the wording for the existing provision relating to Boundary Points on a Distribution System, which is not impacted by P270.

What constitutes Contiguous Transmission System?

This section explains what constitutes Contiguous Transmission System under P270 (and what does not). In the examples in this section all the connections are such that they are designated as Transmission System. Some elements of the examples are hypothetical network elements (i.e. of which no examples currently exist) and are included for illustrative purposes; where this is the case it is clearly stated.

Contiguous Transmission System

The criterion for Transmission System to be considered Contiguous Transmission System under P270 is that it is connected to more than one GSP Group by unbroken Transmission Assets. P270 does not seek to define the main onshore Transmission System as the sole Contiguous Transmission System, but instead leave open the possibility that other networks may be considered Contiguous Transmission System if they meet the relevant criteria.



The diagram above shows part of the main, onshore Transmission System. Because it is connected to both of the GSP Groups shown (as well as all the other GSP Groups) it is considered Contiguous Transmission System under P270.

The diagram above also shows an Offshore Transmission network comprising Offshore Generator A which is connected to both GSP Group A and GSP Group B. Under P270 this would also be considered Contiguous Transmission System under P270. Note however that no instances of this arrangement currently exist.

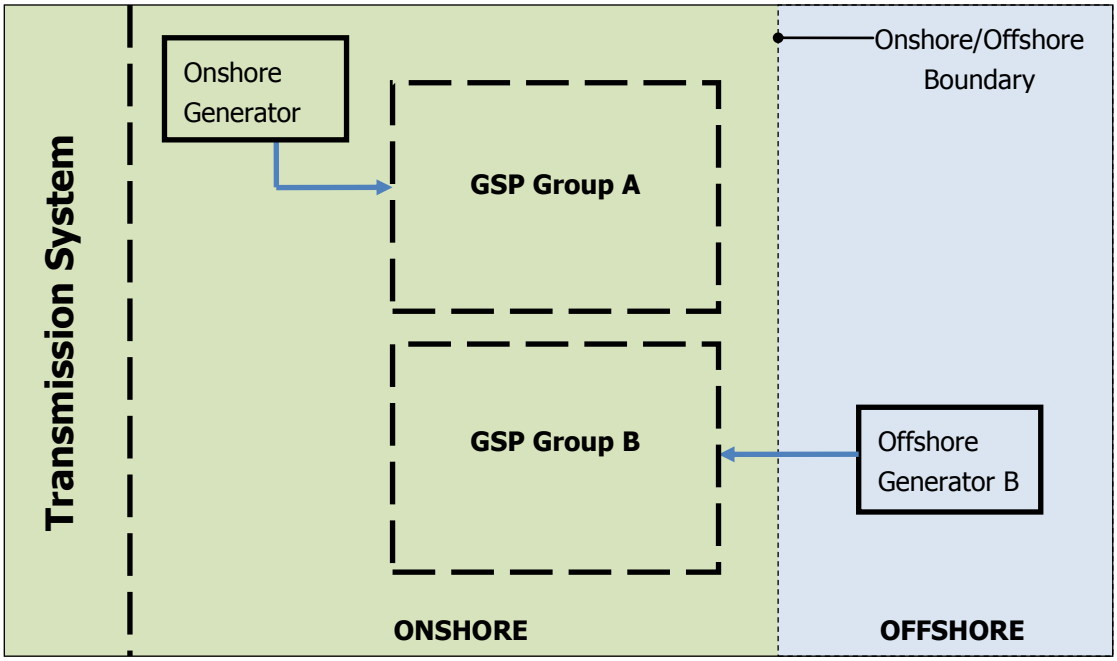
Not Contiguous Transmission System

Any Transmission System not connected to multiple GSP Groups is not Contiguous Transmission System under P270.

The diagram below shows an Offshore Transmission network comprising Offshore Generator B which is connected to GSP Group B. Since it is connected to only one GSP Group it does not constitute Contiguous Transmission System under P270.

The diagram below also shows a hypothetical arrangement where a generator located onshore is connected to a GSP Group via a network that is designated as Transmission System, i.e. the generator is not a conventionally embedded generator and is not

connected directly to the main Transmission System. Because it is connected to only one GSP Group it also would not be considered Contiguous Transmission System under P270. As stated, this is a hypothetical arrangement; no instances of this set-up currently exist, and it is difficult to envisage circumstances in which this or a similar arrangement could arise. However, this configuration is included to illustrate that P270 does not seek to differentiate between Transmission System networks on the basis that they are offshore; if a Transmission System network located onshore meets the criteria that identify it as not Transmission System interconnected under P270 it would not be considered Contiguous Transmission System.



Summary

The P270 solution, and hence legal text, attempts to differentiate between Transmission System networks, and their GSPs, based on whether or not they exhibit Transmission System interconnection. The legal text does this by considering that an interconnected network will be connected to multiple GSP Groups.

As explained above, the P270 legal text is **not** drafted to specifically distinguish either:

- The main, onshore Transmission System from other Transmission System networks; or
- Offshore Transmission System networks from other Transmission System.

5 Initial Workgroup Discussions

The group believed that the key question underlying P270 is whether it is justifiable, in the particular circumstances identified by P270, to effectively shift the cost of losses occurring on a Distribution System into the overall Transmission Losses allocated on a uniform basis between all generation and demand users of the Transmission System.

The Proposer believed that the P270 approach would be appropriate because it would make the losses consequences of transmission connection and operation decisions visible to the Transmission Company. The Proposer believed the equality of treatment of onshore and offshore Transmission connected generation would be maintained under P270.

The view of some group members was that the P270 approach was not appropriate. A member noted that there are currently no circumstances where Transmission Losses include Distribution losses, and commented that whereas prior to the OFTO arrangements the embedded BM Unit received an LLF and picked up the cost of Distribution System losses, under P270 the cost would be socialised via the Transmission Losses arrangements.

The group did not believe that any actual change to Distribution or Transmission System flows or losses would occur if P270 was approved (though they may be 'reclassified'). A majority felt that future Transmission or Distribution System investment decisions would not be affected by approval of P270.

A member that did not support P270 suggested that it would be discriminatory to identify a particular part of the Transmission System and apply an LLF to it. This member believed that the P270 issues could be handled under the LLF methodologies without change to the BSC.

The Proposer argued that accommodating Distribution Losses associated with embedded transmission would inevitably result in distortion of the losses costs for other connectees to the Distribution System, whether by affecting the site specific LLFs of a limited number of users or by socialising across all Distribution System users.

A member considered this issue part of a wider issue of flows between GSPs, both from and to Transmission across Distribution Systems (as in this case) and from and to Distribution Systems across Transmission, due to embedded generation. Output of embedded generators could significantly affect flows from individual GSPs on a Distribution System, affecting Distribution (and Transmission) losses in a manner that could be significant and difficult to predict.

This member did not believe it was obvious that the type of GSP identified by the P270 solution was different to other GSPs; some, most or all of the flow entering a Distribution System might be used within that Distribution System, even if an Offshore Transmission System is isolated from the rest of the transmission system. The member felt this situation would not be significantly different from that of conventional GSPs, and therefore to focus on the particular situation identified by P270 could be viewed as discriminatory.

Some of the group felt that, in practice, it was unlikely that P270 would have any effect on future connection decisions for offshore networks. Since embedded benefits are not applicable to embedded transmission connections it is unlikely that new offshore networks will consider connection via Distribution System.

A member noted that while they were by no means satisfied with the OFTO arrangements overall they were also keen not to introduce small exceptions/discriminations into the arrangements.

Consideration of P270 and P242

Though not directly related to P270, rejected Modification P242, 'Treatment of Exemptable Generation Connected to Embedded Offshore Transmission Networks,' proposed changes to preserve the status quo for some participants impacted by the Offshore Transmission Arrangements.

P242 sought to allow Offshore Exemptable Generators that connect onshore to a Distribution System the option of being treated in the same way as onshore Exemptable Embedded Generators. Under the Offshore Transmission Arrangements such generators must be treated the same as directly-connected Generators.

The Authority rejected P242 because it considered that it would be inappropriate to introduce different treatment within the category of transmission connected generation, that seeking to amend the arrangements would arguably decrease regulatory certainty and hinder effective competition, and that P242 would not promote cost reflective charging and in any case the issues identified do not fall under the BSC.

There are similarities in the areas relevant to P242 and P270 (i.e. both were raised in response to changes resulting from introduction of the offshore regime and both aim to retain the status quo in particular areas in some circumstances). The group considered the issues identified by the P242 decision to try to give a view on whether they have any relevance to P270. Further information on P242 can be found on the P242 webpage on the ELEXON website.

ELEXON analysis

To try to understand and compare how P242 and P270 relate to the intent of offshore transmission policy ELEXON reviewed the work of the Offshore Transmission Embedded Transmission Working Group (OTETWG). The OTETWG met three times in January 2008, and produced a report (which can be found on Ofgem's website).

Section 4 of the report appears to recognise that the Generator should be treated as directly connected, not embedded. Paragraph 4.1 states that 'The power station would be transmission connected but the transmission connection would be connected via a distribution system'.

Section 5 appears to conclude that the LDSO should treat an OFTO connection in the same way as other users of the Distribution System. Paragraph 5.7.5 reads:

> OTETWG noted that under the DCUSA, users of the distribution system are responsible for installing settlement metering. **OTETWG recommends** that current BSC and/or DCUSA arrangements should be developed to ensure that a distribution licensee is able to treat offshore transmission connections consistently to other types of customer connections to the distribution system.

The OTETWG conclusions were reflected the June 2008 Ofgem/BERR Regulatory Policy Update (available from Ofgem's website). This Update included explicit discussion of transitional arrangements for existing schemes, and stated that it was not appropriate to give them TNUoS benefits. ELEXON's interpretation is that:

- It was perceived that approval of P242 would have nullified a policy intent explicitly stated by Ofgem/BERR; but

- The P270 solution appears to be consistent with the OTETWG views and therefore Ofgem/BERR policy intent.

Group discussions

The views of the group were split on the nature of the relationship, if any, between P242 and P270.

The Proposer believed that P270 should be assessed on its merits against the Applicable BSC Objectives, but that the P270 solution does not conflict with any of the reasons given for the rejection of P242. P270 is specifically aimed at the connectee to the Distribution System, i.e. the NETSO, and is not attempting to change the arrangements between the NETSO and the Offshore Generator.

Furthermore, the Proposer noted that P270 specifically seeks to identify all Transmission/ Distribution connection points whose characteristics meet the P270 criteria, and not restrict the P270 provisions to Offshore Transmission Connection Points. The intention is to link the P270 solution to the physical characteristics that drive the need for an LLF, i.e. not designate the issues identified by P270 as solely relating to the OFTO arrangements.

One member did not believe P242 had any relevance to the assessment of P270, noting that the assessment of Modifications under the BSC should be based on whether or not the Applicable BSC Objectives would be better facilitated by the proposed change.

Further to this overall view that considerations relating to P242 were irrelevant and inappropriate for assessment of P270, the member also disagreed with ELEXON's analysis in a number of areas. In relation to the OTETWG's views, they felt that the OFTO arrangements contain inconsistencies because they were also a product of Use of System Charging Methodology Modification Proposal GBECM-08, 'Introduction of charging arrangements associated with Offshore Transmission Networks'. The member also felt that approval of P270 would contradict the rejection of P242 by designating the Offshore Transmission Network connecting the generator to the Distribution System as not part of the 'main' Transmission System

Another member disagreed with ELEXON's analysis because they believed that, although it appears that it is intended that 'embedded transmission' be subject to DUoS charges in the same manner as any other Distribution System user, this does not explicitly apply to LLFs.

This was based on feedback from Ofgem in relation to another BSC change (CP1343) that 'Our understanding is that change proposal 1343 regarding line loss factors for customers metered at primary substations does not interact with the calculation and billing of use of system charges to HVS customers. If that is the case we have no reservations with the proposals at this point in time', which the member interpreted to mean there is no association between DUoS charges under the DCUSA and LLF allocation under the BSC.

The rest of the group considered ELEXON's analysis and did not have any strong views on the matter. Overall, the group did not identify any issues relating to P242 that they felt would affect their assessment of P270 against the Applicable BSC Objectives or that they believed should be brought particularly to the attention of the Authority.

Potential interaction between P270 and P229

The group noted that P270 would effectively shift the cost (or saving) resulting from the effect of a Remote GSP on the losses on a Distribution System from others users of the Distribution System to the Transmission Loss costs of Transmission System users. P229, 'Introduction of a seasonal Zonal Transmission Losses scheme', which is currently awaiting

an Authority decision, would change how Transmission Losses are allocated from a uniform national approach to zonal allocation.

While acknowledging that P270 must be assessed against the existing Code baseline, the group therefore believed it would be prudent to consider how P229 and P270 would interact if both were approved. Under P229 there are two separate mechanisms for apportioning transmission losses:

- **A locational mechanism** (implemented using TLFs)

  Each BM Unit is given a TLF, which is calculated using a Load Flow Model of Nodes on the Transmission System and reflects variable losses on the Transmission System. The TLF values do not reflect any losses on the distribution system caused by OFTO networks (page 8 of the P229 Modification Report: "Because losses over Distribution Systems are not Transmission Losses they would be excluded from TLF calculation").

- **A non-locational mechanism** (using TLMOs as currently)

  This mechanism allocates all the Transmission Losses that aren't included in the TLF value, socialising them across users, while maintaining the current 45/55 overall split between generation and demand.

If both P229 and P270 are implemented losses on a Distribution System resulting from an OFTO connection would not be reflected in the TLF calculation, but would be smeared across all users via the TLMO, just as they would be under P270 without P229. The group therefore agreed that P229 does not have any significant interaction with P270.

LLF definition and LLF Methodologies

In developing the P270 solution the group noted that the BSC definition of an LLF is that it converts data into an equivalent value at the Transmission System Boundary. However, the group questioned whether this relatively straightforward description was fully reflective of the determination of LLFs, which it noted is complex and must accommodate the variable (non-linear) element of losses on the distribution system.

The group did not reach a view on whether there are inconsistencies between the BSC definition of LLF and how LDSOs calculate LLFs, but agreed any such issues around the relationship of the BSC LLF definition and LDSOs' LLF methodologies are outside the scope of P270.

Retrospection

The P270 Modification Proposal suggested that the P270 solution should be applied retrospectively, though only back to the first OFTO appointment at the beginning of March.

The group considered the guideline criteria that Ofgem has previously noted in relation to the retrospective application of changes. The group agreed that retrospection does not appear to be justified for P270. The Proposer agreed not to include retrospective application as part of the solution for industry consultation, but noted that they would further consider this and would like to know the views of industry participants.

6 Analysis of the Materiality of P270

The group estimated the materiality of the P270 issue by calculating the impact of applying LLFs to sites to which the BSC does not currently permit an LLF to be applied, but which meet the criteria of the P270 solution. The only such sites identified by the group were some of the projects in the first round of the Offshore Transmission arrangements. Note that the generation projects identified are used as a proxy for their onshore connections, to which the LLFs would actually be applied under P270.

The approximate annual output of each connection was determined by applying a load factor of 0.3 (agreed by the group) to the calculated annual output of the generator (based on its stated capacity). The impact of P270 was estimated by applying the LLF to the annual output. The P270 materiality is the difference between the output before and after application of the LLF. An estimate of the monetary value of this materiality was calculated by applying a price of £60 per MWh.

The overall (net) materiality of the P270 issue is estimated to be **6791MWh**. If P270 is approved this would result in an increase of **0.13%** in overall Transmission Losses, based on approximate total Transmission Losses of **5391000MWh** in 2010.

Approximate materiality of P270 issue for Round 1 projects

Project	Distribution connection	Size (MW)	Estimated output (MW)	MWh/ year	LLF	Materiality (MWh/year)	Materiality (£/year)
Barrow	Electricity North West	90	27	236520	1	0	0
Robin Rigg East&West	Electricity North West	180	54	473040	0.97	14191	851472
Gunfleet Sands 1&2	UK Power Networks	164	49.2	430992	1.004	-1724	-103438
Sheringham Shoal	UK Power Networks	315	94.5	827820	1.004	-3311	-198677
Ormonde	Electricity North West	150	45	394200	1	0	0
Greater Gabbard	None	504	151.2	1324512	-	-	-
Thanet	UK Power Networks	300	90	788400	1.003	-2365	-141912
Walney 1	None	178	53.4	467784	-	-	-
Walney 2	Electricity North West	183	54.9	480924	1	0	0
	Totals	2064	619.2	5424192		6791	407445

Greater Gabbard and Walney 1 do not connect to a Distribution System, and therefore would not receive an LLF under P270 (and therefore do not contribute to the materiality of the P270 issue), but are included in the table since they are part of the first round of projects under the Offshore Transmission arrangements. There are no Distribution System-connected sites in the currently planned subsequent rounds.

LLFs used are 'snapshot' values that might be applied to the identified sites based on the present state of the Transmission System and Distribution Systems. Changes on the

amount of onshore or offshore generation or demand could affect the LLFs of Remote GSPs (i.e. in the same way such changes might affect other LLFs).

Robin Rigg was the driver for the raising of P270, and its connection was the first to be designated as Offshore Transmission under the OFTO regime, at the beginning of March 2011. As such an LLF cannot be applied to either the Robin Rigg generator itself or its point of connection to the Distribution System. The group estimated the approximate annual output of Robin Rigg as 473,040MWh per year, based on its stated capacity of 180MW. The group estimated the materiality of the P270 issue in relation to the Robin Rigg connection as 14191MWh per year by using the LLF of 0.97 that was applied to Robin Rigg prior to the OFTO regime. This is the approximate volume of energy that would need to be smeared across users of the Distribution System each year under the baseline or, under P270, would be shifted into Transmission Losses. The group estimated the monetary value of this as approximately £850,000 per year.

The Robin Rigg connection is the only significant example of the P270 issue identified (either currently extant or planned). The materiality of other prospective Distribution System-connected Offshore Transmission is significantly less than that of the Robin Rigg connection, but may still be material.

The LLFs applied to projects connected to the UKPN network are based on generic LLFs for Extra High Voltage sites because there is currently insufficient information to calculate site specific LLFs. These values are the best estimate possible for the purposes of this analysis, but the site specific LLFs that would eventually be applied to the sites (i.e. under P270) could be materially different (increased or decreased), which would affect the estimate of the materiality.

LLFs of 1 are applied to the projects, other than Robin Rigg, connected to the ENW network, because these sites are connected very close to 'conventional' GSPs on the Distribution System. They will therefore neither materially cause nor relieve Distribution System losses, so ENW has advised that if they were to receive an LLF it would be 1. This means that the P270 issue has zero materiality in relation to these sites.

7 Final Workgroup Discussions

Consultation Responses

11 responses were received to the P270 Assessment Procedure industry consultation. Respondents included Distributors, Suppliers, Generators and Party Agents. Respondents were split on the question of whether P270 would be an improvement on the existing arrangements. A slight majority of six respondents believed that the P270 solution would not better facilitate the Applicable BSC Objectives compared with the existing Code baseline.

The group did not identify any significant new arguments either for or against P270 in consultation responses. CE Electric UK argued that:

- Not allocating an LLF to an offshore (i.e. remote) GSP could mean that associated Distribution System losses are shared between other customers and potentially create a cross subsidy; and
- Without P270 large on-shore generators who have an LLF might be at a competitive disadvantage compared with off-shore generators who do not.

CE Electric UK believed applying an LLF to remote connections would remove this different treatment of offshore (remote) and onshore (interconnected) generation and associated potential cross-subsidies, and P270 would therefore better facilitate Objective (c). The group did not believe that sharing Distribution System losses between other Distribution System customers would constitute a cross-subsidy, and considered that P270 would not directly impact competition between generators because even under P270 no LLF would be applied to a generator on an isolated piece of the Transmission System, but rather to the GSP connecting that Transmission System element to a Distribution System.

However, the group considered that if P270 is approved there is a possibility that the effect of a Remote GSP's LLF could be passed through to the generator connected to it (though they acknowledged a further change might be needed to enable this to occur).

Potential Alternatives

Nine respondents did not believe there were any potential P270 Alternative solutions that the group should consider. SmartestEnergy suggested that an alternative solution was to require Settlement metering to be at point of connection to the network onshore. The group did not believe this would address the issue identified by P270 and agreed that it appeared to be counter to the intent of the Offshore Transmission arrangements.

CE Electric UK asked whether consideration had been given to whether the losses on Distribution assets (that result in an LLF calculated by the Distributor) could be separated from the losses on the offshore (remote) Transmission assets. The group believed that in principle this could be done, but did not believe it would resolve the P270 issue, i.e. if the LLF-associated losses are identified the question of who they are allocated to remains. The group did not believe that separating out the LLF losses as suggested would present any alternative candidates to receive the impact of such losses, i.e. further to either Transmission System connectees (under P270) or some or all Distribution System customers (under the baseline).

The group agreed that there were no potential solutions that should be further developed or progressed as a P270 Alternative solution.

Legal Text

Only EDF Energy had significant comments on the P270 Proposed legal text. They suggested that instead of the suggested change to K1.7.3, to remove the reference to a Boundary Point, either the current wording 'at a Boundary Point' should be retained or wording such as 'at a Boundary Point or a Remote Grid Supply Point' should be used to extend K1.7.3 to cover Remote Grid Supply Point without affecting its current meaning.

EDF Energy were concerned that the suggested wording would leave open the possibility that all Metering Systems "on" a Distribution System, even metering between Distribution Systems with different owners that might not be used in Settlement, should have an LLF. They believed this would be unnecessarily burdensome, and it should be made clear that only Metering Systems used for Settlement require an LLF. The group did not agree that the suggested text would have the result identified by EDF Energy's concern, because the provisions of K1.7.3 only apply to LLFs, they do not identify where LLFs must be applied.

However, the group considered that the suggestion to add 'or a Remote Grid Supply Point' would be equivalent to the suggested approach of removing the reference to a Boundary Point and would result in greater clarity. The group therefore agreed that the legal text should be updated in line with this suggestion, including any further changes to K1.7.3 needed to support this revised approach.

EDF Energy also suggested that the proposed new definitions should refer to 'Contiguous **Main** Transmission System' instead of 'Contiguous Transmission System'. However, the group established that this suggestion stemmed from a misapprehension that P270 was aiming to identify a single Contiguous Transmission System that is the 'main', onshore Transmission System.

In fact, the P270 solution leaves open the possibility of multiple Contiguous Transmission System networks to cater for the possible existence in the future of interconnected offshore networks which are able to respond to the demand of Distribution Systems in a similar manner to the main onshore Transmission System. The group therefore agreed that no change was required to the proposed 'Contiguous Transmission System' definition.

The group noted that under the proposed text:

- Connection of an Offshore Transmission System to two Distribution Systems would cause the relevant GSPs not to be considered Remote GSPs under P270; and
- An isolated onshore Transmission System circuit (e.g. connecting to the main Transmission System through a Distribution System substation) would be considered a Remote GSP.

The group also agreed that the other issues mentioned in EDF Energy's legal text comments are out of the scope of P270.

Implementation Impacts

The majority of respondents confirmed that they would not be impacted by implementation of P270. Electricity North West and UK Power Networks are the two LDSOs with existing or planned connections on their networks that would be considered Remote GSPs under P270, and accordingly identified impacts on LLF methodologies and the LLF calculation. National Grid confirmed an impact due to LLFs being assigned to Remote GSPs and the consequent effect on Transmission Losses.

Other than the two affected LDSOs and the System Operator, only EDF Energy identified an impact, as a result of processing new LLFs using existing systems and procedures.

None of the respondents identified cost or lead time impacts as a result of implementation of P270.

Implementation Approach

Ten respondents supported the proposed implementation approach. However, one respondent believed that any changes to Code Subsidiary Documents required to support the P270 solution should be made at the same time as the necessary changes to the BSC. The group considered that in the case of P270 no issues would arise from the proposed approach of implementing the P270 solution in the BSC and then making the supporting Code Subsidiary Document changes in a subsequent date, but agreed that in principle all changes should be made simultaneously.

They therefore agreed that if the Code Subsidiary Document changes can be drafted in time to be included in the P270 Report Phase industry consultation, P270 should be implemented in both the Code and any affected Code Subsidiary Documents at the same time, i.e. outside of a standard BSC Release and at an appropriate number of days after an Authority decision. If Code Subsidiary Document changes cannot be consulted upon in the Report Phase industry consultation the original, staggered implementation approach may be employed.

Analysis of Materiality

None of the consultation respondents disagreed with the group's approach to the analysis of the materiality of P270. Only analysis of the materiality of the P270 issue for Robin Rigg was included in the P270 consultation, though it was noted that similar analysis would be conducted for other sites that meet the criteria of Remote GSP, albeit Robin Rigg was understood to be the most significantly impacted existing or planned site.

Respondents commented that the Robin Rigg materiality is a fair representation of the impact of an OFTO connection on a Distribution System, and though it may not appear significant in terms of overall Transmission Losses it could be significant for individual customers. CE Electric UK noted that offshore generation is intended to be a growing sector, so it is possible that any adverse effects of the current arrangements on Parties may well be amplified over time.

Western Power Distribution agreed with the assessment of the impact on LDSO losses, but believed that analysis of potential distortion of competition in generation (between Distribution System-connected and Remote GSP-connected generators) caused by the current arrangements might further strengthen the case in support of P270.

Unfortunately WPD's response was late, and as such was not discussed by the group at its final meeting, however no analysis was specified that could be conducted to support the contention that there is potential distortion of competition in generation. Moreover, the group agreed, with regard to CE Electric UK's comments (in response to question 1), that P270 would not directly impact competition between generators because P270 would see LLFs applied to a GSP connecting a generator on an isolated piece of the Transmission System to a Distribution System. Since the group did not identify a potential for distortion of competition in generation as a P270 issue, and as such placed no weight on this argument in its views against the Applicable BSC Objectives, there does not appear to be any need for supporting analysis in this area.

Any discrimination between generators connected to 132kV Distribution (in England and Wales) and generators connected to 132kV Transmission (in Scotland and Offshore) had

been considered during development of the BETTA and OFTO arrangements, and is beyond the scope of the BSC.

Retrospection

None of the respondents supported retrospective application of the P270 solution. Electricity North West adopted a neutral stance and noted, as Proposer, that it would make a final decision on whether the P270 solution should be retrospective at the final group meeting. The group agreed that there was still no basis for retrospective implementation of P270.

Therefore the Proposer confirmed that retrospective effect would not be part of P270, and the P270 solution would have effect only prospectively from the point of its implementation.

Considerations outside the scope of the BSC

In light of the Authority's wider statutory remit the consultation asked for any views from respondents with regard to benefits or disadvantages of P270 that are outside the scope of the BSC, though such considerations would clearly be outside the scope of P270.

Six respondents believed P270 would have an effect, two that it would not have any effect they are aware of, while three were neutral.

Electricity North West provided a summary of the benefits they believe P270 would have outside the BSC, including the DNO Losses Incentive and its view of the implications of NGET as offshore System Operator being a party to DCUSA and liable for Distribution Use of System charges in respect of offshore connections to distribution networks.

Scottish Power's response noted that it is possible P270 might alleviate non-BSC problems but that, as a principle, problems should be solved where they occur, which would not be the case with P270.

Other comments

Five respondents had further comments on P270. Most had been covered elsewhere in the assessment of P270 or in the consultation responses. However, the group considered E.ON UK's concern regarding ELEXON interpreting a previous Ofgem decisions in relation to the OTETWG from January 2008 and the subsequent Ofgem/BERR policy update (see 'ELEXON analysis' within the section 'Consideration of P270 and P242'). E.ON noted that as with any BSC proposal assessment of P270 must be in relation to achievement of the Applicable BSC Objectives.

The group agreed that P270 must be assessed against the Objectives and considered that the interpretation and discussion of previous proposals and decisions should not be given prominence in the assessment of P270, though it should be documented as part of the detailed record of the group's discussions.

In line with this, a group member noted that the remarks relating to CP1343 under 'Group discussions' within the section 'Consideration of P270 and P242' should be noted without undue regard to the interpretation given to them by the member.

Further discussions

Having considered the consultation responses, a group member reiterated their belief that the issues identified in relation to P270 could be handled under Distributors' LLF methodologies and, if necessary, changes to the DNO Losses Incentive scheme. However,

the group noted that the Losses Incentive is firmly tied to LLFs used in Settlement, and to change this would require a change to the Licence Conditions.

The belief of some members, as previously stated, was that, in practice, P270 was unlikely to have a significant effect on future connection decisions for offshore networks. The group clarified that this was based on the view that it is generally not cost effective to connect large offshore generators to Distribution Systems (primarily due to the network reinforcement required) since there are currently no incentives (i.e. generally, though there may be drivers in particular cases).

This means that widespread connection of new Offshore Transmission networks via Distribution Systems is unlikely. Therefore it appears unlikely that P270 would influence Offshore Transmission connection decisions because sites that would constitute Remote GSPs under P270 are unlikely to be created either under P270 or under the current baseline. However, it is nonetheless possible that smaller generation sites might be connected via Distribution Systems.

Conclusions and recommendations

Taking into consideration the responses to the P270 Assessment Procedure consultation and their further discussions, the group agreed the P270 implementation approach and confirmed their final views on P270 against the Applicable BSC Objectives. The group's final views aligned with their initial views, except that one member believed that a disadvantage that they had originally ascribed to both Objectives (a) and (b) should only be against Objective (b), meaning the member now believed P270 to be neutral with respect to Objective (a). The group's final views are set out in the main Assessment Report document.

8 Costs and Impacts

Costs

ELEXON Cost		ELEXON Service Provider cost	**Total Cost**
Man day	Cost		
8	£1920	£1000	**£2920**

Indicative industry costs
Zero industry costs for P270 implementation; any consequent activities (such as calculation of LLFs by LDSOs) conducted under normal processes.

Impacts

Impact on BSC Agent	
CDCA	Possible impact due to need to include LLFs in Aggregation Rules for Offshore Transmission Connection Points

Impact on BSC Parties and Party Agents
LDSOs: LLF calculation and calculated Distribution System losses (and GSP Group Take) Suppliers and embedded generators: no implementation impact (but effects from impact on GSP Group Take and/or Line Loss Factors for other connections in the GSP Group)

Impact on Transmission Company
Responsible (as NETSO) for Offshore Transmission Connection Points assigned LLFs

Impact on ELEXON	
LLF validation	ELEXON audits and approves LLFs calculated by Distributors, and under P270 would do so for LLFs calculated for remotely connected GSPs

Impact on Code	
Section K Classification and Registration of Metering Systems and BM Units	Amend to allow LLFs for Remote Grid Supply Points
Sections X Definitions and Interpretation	Add and amend definitions to support the P270 solution

Impact on Code Subsidiary Documents
BSCP25 Registration of Transmission System Boundary Points, Grid Supply Points, GSP Groups and Distribution Systems Connection Points
BSCP75 Registration of Meter Aggregation Rules for Volume Allocation Units
BSCP128 Production, Submission, Audit and Approval of Line Loss Factors

9 Workgroup Membership

Member	Organisation	22.3.11	10.5.11	27.5.11
Adam Lattimore	ELEXON (Chairman)	✓	✓	✓
Dean Riddell	ELEXON (Lead Analyst)	✓	✓	✓
Mike Attree	Proposer (ENW Limited)	✓	✓	✓
Ben Smith	National Grid	✓	✓	X
Esther Sutton	E.ON UK	X	✓	☎
Harminder Basi	UK Power Networks	✓	✓	✓
Gary Henderson	Accenture	✓	✓	✓
Martin Mate	EDF Energy	X	✓	✓
Garth Graham	SSE	☎ (part)	X	X
Bill Reed	RWEnpower	✓	✓	✓
Attendee	Organisation			
Nicholas Brown	ELEXON (Lawyer)	✓	✓	X
John Lucas	ELEXON (Design Authority)	✓	✓	X
Sarah Jones	ELEXON (Operational support)	✓	✓	X
Bimbola Ayo	Ofgem	✓ (till 1)	✓	X
Paul Jones	E.ON UK	✓	X	X

10 Glossary

Acronym	Term
BSCP	BSC Procedure
GSP	Grid Supply Point
LDSO	Licensed Distribution System Operators
LLF	Line Loss Factor
OFTO	Offshore Transmission Owner
OTETWG	Offshore Transmission Embedded Transmission Working Group