

The Voice of the Networks



**DNO Common
Network
Asset Indices
Methodology**

**SLC 51 Part I
Consultation**

26 August 2016

Common Network Asset Indices Methodology Proposed Modifications – Standard Licence Condition 51 Part I Consultation

1 Purpose and Objective

The purpose of this consultation is to seek the views of Stakeholders as to the proposed changes to the Common Network Asset Indices Methodology from Draft Version 4 (as directed for implantation by Ofgem in February 2016) and the DNO community Version 1 as proposed in July 2016

1.1 Executive Summary

Standard Licence Condition (SLC) 51 of the RIIO-ED1 price control requires the Distribution Network Operators (DNOs) to ‘use all reasonable endeavours...to ensure that by 1 July 2015 the Common Network Asset Indices Methodology (CNAIM) has been submitted for approval by the Authority’.

The objectives of the CNAIM are to;

- (a) facilitate the achievement of the Network Asset Indices Methodology Objectives;*
- (b) enable the objective evaluation of performance against the Network Asset Secondary Deliverables;*
- (c) be implemented by the licensee through appropriate amendment of its own Network Asset Indices Methodology in accordance with the provisions of Part A of this condition; and*
- (d) be capable of being modified from time to time in accordance with the provisions of Part I of this condition. ¹*

DNOs worked collectively to develop a proposal for the CNAIM and submitted this to Ofgem for approval on 1 July 2015 (‘version Draft V3’). This set out an approach that allowed for the assessment of the health of assets which was converted to a Probability of Failure (PoF) value. This is then combined with an assessment of the Consequences of asset Failure (CoF) to produce an overall risk score for each asset within the scope of the Methodology. These risk scores are additive and form the basis for an overall view of both current and future network health.

Following a period of public consultation, Ofgem directed further refinement and development of the proposed methodology which resulted in a revised proposal being tabled by the DNOs in December 2015 (‘version Draft V4’). Following a further review, Ofgem approved and Directed the Methodology in February 2016, whilst requesting a number of minor updates to the text of the document.

Ofgem approval triggered a requirement to implement the changes to the Methodology within 26 weeks of the date of the Direction or any later date specified by the Authority, which was specified as 30 December 2016, due to the requirement to make the minor updates to the Methodology. The DNOs have been developing the requisite data structures and modelling capabilities to enable this to occur. DNOs were also directed to re-submit

¹ 51.6 in

<https://epr.ofgem.gov.uk//Content/Documents/Electricity%20Distribution%20Consolidated%20Standard%20Licence%20Conditions%20-%20Current%20Version.pdf>

the associated Network Asset Workbook (NAW), which permits the Asset Risk Delta due to investment to be stated for the RIIO ED1 Period (April 2015 – March 2023), by 30 December 2016.

During the course of implementation, a number of minor amendments have been made by the DNOs to correct for errors or omissions in version Draft V4 of the Methodology. It is the view of the DNOs submitting this modification that these are necessary and sensible, and further that the remaining changes will not alter the risk calculations performed in the Methodology.

It is Ofgem's view that these changes constitute a modification to the Directed Methodology and hence need to go through the change control process set out in part I of SLC51. This requires a consultation on the proposed changes followed by a report to Ofgem. If Ofgem do not issue a direction not to implement within 28 days of the receipt of the report, then the changes are deemed agreed.

The requirements for the report are set out in SLC51.25.

This document sets out for statutory consultation our proposed changes to the Common Network Asset Indices Methodology.

All DNOs have worked collectively on the development of the Methodology and its implementation. The proposed changes have been raised, reviewed and agreed in a DNO Working Group and these proposals are tabled on behalf of all licencees.

It is our recommendation that the Methodology is duly approved with these amendments incorporated.

The consultation is issued on behalf of the following Company's that, between them hold the fourteen GB Electricity Distribution licences:

Electricity North West
Northern Powergrid
Scottish and Southern Distribution
Scottish Power Energy Networks
UK Power Networks and
Western Power Distribution

2 Background

2.1 Chapter Summary

This chapter provides an overview of the development of the Common Network Asset Indices Methodology, the proposed changes and our proposed next steps.

2.2 Requirement for a Common Network Asset Indices Methodology

The requirement for a CNAIM grew out of the development of Health Indices in the previous electricity distribution price control (DPCR5), and the use of Criticality (ie the relative consequences of an asset's failure) as an input to the calculation of asset risk for the RIIO-ED1 price control submissions.

The requirement to develop a common approach to the measurement of condition-related risk was set out in Standard Licence Condition 51 of the RIIO-ED1 licence;

<https://epr.ofgem.gov.uk//Content/Documents/Electricity%20Distribution%20Consolidated%20Standard%20Licence%20Conditions%20-%20Current%20Version.pdf>

The CNAIM is required to be suitable to achieve the specified Network Asset Indices methodology Objectives set out in Part D of the condition;

The Network Asset Indices Methodology Objectives are that compliance with the Common Network Asset Indices Methodology enables:

(a) the comparative analysis of network asset performance between Distribution Services Providers over time;

(b) the assessment of the licensee's performance against the Network Asset Secondary Deliverables; and

(c) the communication of information affecting the Network Asset Secondary Deliverables between the licensee, the Authority and, as appropriate, other interested parties in a transparent manner.

2.3 Approach to methodology development

2.3.1 Working Group

The DNOs created a Working Group comprising members of each of the six DNO Groups, supplemented by specialists from EA Technology. Ofgem representatives had a standing invite to the Group and frequently attended the sessions. In addition, bilateral and multilateral presentations were made to Ofgem staff during the course of methodology development.

The Group successfully delivered a draft Methodology to Ofgem on 1 July 2015 in line with the licence requirement.

2.3.2 Methodology consultations

August 2015 consultation

Following internal review, Ofgem undertook a public consultation on the DNO's proposals;

<https://www.ofgem.gov.uk/publications-and-updates/consultation-distribution-network-operators-dnos-common-network-asset-indices-methodology>

This concluded that a number of changes were required and Ofgem issued a Direction to that effect in October 2015;

<https://www.ofgem.gov.uk/publications-and-updates/dno-common-network-asset-indices-methodology>

DNOs re-convened the Working Group and developed a revised version of the Methodology. This also incorporated the learning from further testing and calibration work to refine the detail of the calculations. This testing was based on early prototype models which mimicked the logic of the Methodology.

The DNOs subsequently submitted a revised version of the Methodology in December 2015, addressing the requirements of the October 2015 Direction.

February 2016 Direction

After review of the modified Methodology, Ofgem deemed that it met the requirements of SLC51 and Directed its implementation on 1 February 2016;

<https://www.ofgem.gov.uk/publications-and-updates/decision-dno-common-network-asset-indices-methodology>

The Direction included a small number of requested narrative enhancements to the Methodology document.

2.3.3 Experience of implementation

DNOs have worked collaboratively to implement the Methodology and collectively commissioned a third party supplier to build detailed models embodying the Methodology's functionality. This process identified a number of minor errors or inconsistencies in the Methodology as written and these were corrected in the course of model development and testing.

2.3.4 Structure of this document

Chapter 3 sets out the detailed changes that have been made from the version of the document Directed by Ofgem in February 2016.

It should be read alongside the updated version of the Common Network Asset Indices Methodology published in conjunction with this consultation.

3 Questions

3.1 Chapter Summary

This chapter lists the changes made from the Directed methodologies and identifies those considered as modifications to the Methodology.

3.2 Questions

Question 1: Do you agree that changes 13, 15 and 19 constitute appropriate Modifications to the Methodology?

Question 2: Do you agree that the other amendments made are corrections and do not constitute modifications to the Methodology?

In responding to the questions, please provide an explanation or reasoned argument together with any additional supporting evidence you have in support of your opinion.

There are 22 changes from the version of the Methodology Directed by Ofgem in February 2016 and they are listed in the table below. For clarity, these have been classified into three categories;

- Clarification – where the text of the document has been modified to better explain a particular point with no change to the Methodology itself;
- Correction of omission – where a point of necessary detail was missing from the Methodology; and

- Correction – where the Methodology was in error, or internally inconsistent.

Change 13 is a correction which puts in place a distinction between HV & LV and 132kV & EHV cables to reflect the n-1 nature of the latter assets (ie their in-built redundancy such that one asset should be able to take the load of two in case of fault). As such, they are designed to be loaded to 50%, hence the previous scale would not have allowed any distinction in criticality for these assets.

Change 16 corrects for a calibration error in the Condition Input cap for EHV Non Pressurised Cable. This should have been set to 5.4 to ensure that an asset with no historic faults is capped at a health index of HI2, rather than HI3, consistent with the treatment at 132kV.

Change 19 identifies that there are four possible Criticality states for the Environment CoF for Oil Filled Cables; however the proximity to watercourse factor was only split into three categories. Due to the dominance of this particular consequence factor for this asset, this meant that results could only be generated for three of the four Criticality states. To restore the intended granularity, a fourth proximity band was added, and the scale recalibrated to enable results in all four states.

The three changes above will amend the reported risk for assets in those categories hence have been identified as modifications to the Directed methodology. It is the view of the DNOs submitting this modification that these are necessary and sensible, and further than the remaining changes will not alter the risk calculations performed in the Methodology.

Change 15 relates to the removal of four tables (171,173,178,180) in the Methodology for Partial Discharge test results on EHV and 132kV Gas and Oil Filled cables. These were included in error as this technique is only relevant for Non Pressurised Cable and hence would have been left blank in any case.

Ref	Draft v4 Document location	Issue	Action taken	Change Category	Impact on Model Output
1	Section 5.2	The document does not explicitly state that for linear assets we are calculating and reporting the PoF per km per annum.	Make clear in document that the PoF for linear assets is the PoF/km not PoF per asset	Clarification	None
2	Section 6.1.8	The ageing rate should not be trued-up for assets where ageing has been observed, but there is no mention of this in the document.	Update document to show that no re-calculation of the Ageing Rate takes place where the Current Health Score = 0.5	Correction of omission	None
3	Section 6.2 bullet (ii)	The text does not mention that the Health Score Modifier for the Tapchanger Component includes an Oil Test Modifier. However, Section 6.8.2 makes it clear that it does.	Section 6.2 text to be revised in order to remove the inconsistency.	Clarification	None
4	Section 6.3	It is not clear from the document how the Health Score Cap of the Paintwork Component of a Tower is applied.	Update document to make it clear that the cap of 6.4 is applied to both the Current and Future Health Score of the Paintwork Component.	Clarification	None
5	Section 6.4	The document does not specify the calibration settings (Distance from Coast Factor, Altitude, corrosion etc.) for Tap Changers	Apply settings within the model as per Transformers. Include in next document revision.	Correction of omission	N/A - The calculation will fail without calibration settings.

Ref	Draft v4 Document location	Issue	Action taken	Change Category	Impact on Model Output
6	Section 6.4	No Default Situation is defined for the Location Factor; i.e. should the model assume Indoor or Outdoor for an asset where this data is missing?	The working group has agreed a default for each Asset Register Category and implemented this in the model. The table of defaults is to be included in the next document revision.	Correction of omission	N/A - Without a default, the calculation will fail if no Situation (Indoor/Outdoor) is provided.
7	Section 6.7.2	Ambiguity in the application of Max No. of Combined Factors.	Redraft MMI explanation to make clear that Max No. of Combined Factors includes the Max itself.	Clarification	None
8	Sections 6.7.5, 6.12 and 6.13	Calculated Collars (DGA and FFA) have not been limited and are therefore overriding the Health Score Cap of 10.	Include a final cap in the model and add appropriate text to the document.	Correction	None, this correction will ensure that model returns a Current Health Score in the range of 0.5 and 10
9	Table 15 (measured MMI combined factors) (page 63)	Incorrect for LV CBs. The table says two factors but there is only one input factor for LV CBs (see Table 132 - Page 127)	Calibration has been set to 1 in the model. Table 15 is to be revised to remove the inconsistency.	Correction	None
10	Table 16: Reference Costs of Failure	LV UGB and LV Pillar (OD not at a Substation) categories in this table are grouped together. However, these asset types have different reference costs specified in some of the tables elsewhere in the document, and therefore have been incorrectly summarised in Table 16.	Split these out in the next document revision.	Correction	None - The model calculates the Reference Costs from the input data in Appendix D.

Ref	Draft v4 Document location	Issue	Action taken	Change Category	Impact on Model Output
11	Section 8: References	Ofgem have requested that Referencing and Decision Documentation are further improved upon.	Revise document as requested.	Clarification	None
12	Appendix B.1: Normal Expected Life	When we plan to Retrofit a Breaker (Replace the moveable portion) we add 20 years to the Normal Expected Life from the date that the retrofit takes place, as per Appendix C. However, where a breaker has been retrofitted in the past the model needs to be told this in order to apply the correct Normal Expected Life. There is currently no mention of this in the document.	For HV and EHV Switchgear, include a data input in the model to flag whether an existing breaker has been retrofitted in the past. Add a note to the Normal Expected Life table in the document.	Correction of omission	The model will now return the correct HI for breakers with historic retrofits.
13	Appendix B.4: Duty Factor	No distinction is made between HV and EHV/132kV cables for % Utilisation, despite EHV/132kV cables being N-1 assets. Therefore the majority of EHV and 132kV will fall into the $\leq 50\%$ band and the factor will be useless for making a distinction between assets with varying % Utilisation.	Add a column to the table and split into 1) HV and 2) EHV and 132kV with a Duty Factor of 1 assigned to $\leq 50\%$ for EHV and 132kV	Correction	% Utilisation will add value to the calculation by increasing the Initial Health Score of more Heavily Loaded EHV/132kV assets, thereby allowing them to be distinguished from more lightly loaded assets.
14	Table 31: Duty Factor Lookup Table - Switchgear	No Default was defined.	A Default Value of 1 has been used in the model, as per all other asset categories. Table 31 is to be revised to correct the omission.	Correction of omission	N/A - Without a default, the calculation will fail if no Duty Factor data is provided.

Ref	Draft v4 Document location	Issue	Action taken	Change Category	Impact on Model Output
15	Appendix B.6 : Measured Condition Factors	For Cables, Partial Discharge testing is only relevant for Solid (Non Pressurised) Types, however these tables were also included in the document for Gas and Oil Filled Cables in error.	Remove tables 171, 173, 178 and 180 from the document and omit from the model.	Correction	None, MMI Max Number of Combined Factors is 1. Therefore there will be no impact on the model output as no DNOs collect this data and Leakage is therefore the only Factor considered.
16	Tables 170 and 177: Fault History	Condition Input Cap for "no historic faults recorded" should align for EHV and 132kV Non Pressurised Cable. Both should be 5.4. Also, there is a signage error which means that the highest two bands of <0.1 and >0.1 to misses out an input of exactly 0.1.	The Condition Input Cap has been set to 5.4 in the model. The last band has been set to ≥ 0.1 per km in the model. This will be adjusted in the next version of the document.	Correction	An EHV Solid Cable with no historic recorded faults will now be capped at HI2 instead of HI3. This was always the intention, as evidenced by this being the case for 132kV Solid Cable.
17	Tables 199 and 200 : Oil Test Modifier	Document says >0 for these Tables, but >-0.01 for the others.	Use <-0.01 for consistency with model and next document revision	Correction	None
18	Table 220 : Reference Environmental Cost of Failure	The Reference Environmental Cost of Failure table leaves some room for interpretation due to Incipient, Degraded and Catastrophic failures probabilities being lumped together in merged cells for Towers, Fittings, Conductor and Non Pressurised Cable.	De-merge cells and show agreed probability values as Catastrophic, as per the calculation method used to derive the current Reference Costs in the document.	Clarification	None, calculated Reference Costs remain unchanged.

Ref	Draft v4 Document location	Issue	Action taken	Change Category	Impact on Model Output
19	Table 223: Location Environmental Factor	There is an illogical discrepancy between the factors applied to different Asset Categories when considering the Proximity to Watercourse. Also, due to the relative weighting of the of the Environmental CoF for Oil Filled Cables, it is only possible to generate results in three of the four CI bands, as Proximity Factor only contains three bands.	Add a fourth Proximity Factor Band and align factor values across all relevant asset categories.	Correction	Although there is no change to the underlying methodology, the improved resolution on the Proximity Factor will result in a change to the asset distribution across Criticality Bands, particularly for Oil Filled Cables, where all four reporting bands will then be utilised.
20	Appendix D.4 : Network Performance	Appendix D.4 is the only appendix which doesn't state the CoF Factors. Appendices D.1-D.3 do this for Safety, Financial and Environmental.	Duplicate the Network Performance Factors in Appendix D.4 in the next document revision.	Correction of omission	None
21	Appendix D: Eq. 30 & 31	Spelling mistake and formatting errors.	Correct errors in next revision. Paste Eq. 30 from pg84 into pg164.	Correction	None
22	Appendix E : Worked Examples	Ofgem have requested that the examples are revised to show the calculation steps.	Revise document as requested.	Clarification	None

4 Responses

Responses should be submitted to the ENA secretariat by 23 September 2016 no later than 17.00hrs to regulation@energynetworks.org. Alternatively submissions by post as detailed below must be received by the same time at the address below.

Electricity North West Limited
Head of Asset Management
Hartington Road,
Preston,
PR1 8AF

This proposal is tabled on behalf of the licencees listed on page 4 but is hosted on Trade Association's website.

Unless clearly marked **confidential**, all responses to the consultation (regardless of original media) will be published on the Electricity Networks Association website until 21 October 2016. After that date copies of the consultation responses can be obtain by writing to:

Electricity North West Limited
Asset Management Modelling Manager
Floor 3
Hartington Road,
Preston,
PR1 8AF

and providing either a return postal or e mail address.

5 Next Steps

5.1 Chapter Summary

This chapter sets out the next steps in the process for enacting the proposed changes to the Common Network Asset Indices Methodology.

After the closing date has passed, the six GB DNO's (see page 2) who are mandated to conduct this consultation will consider the responses received. A report summarising the responses, together with copies of all received documents will be sent to Ofgem who may either direct the revised Common Network Asset Indices Methodology be adopted or Direct that the existing Methodology continue to be implemented. Our proposed timetable for the entire consultation is shown below:

	Date
Consultation published on Electricity Networks Association website	26 August 2016
Consultation closes	23 September 2016
DNOs present report to Ofgem on proposals and responses to the consultation	7 October 2016
Ofgem objection period lapses and modifications deemed to come into force	4 November 2016