

Appendix 1 : Annex 1 List of required changes and response

1. Run a calibration exercise. Apply the methodology to a significant sample of the licensee's asset population. According to the results, update the numbers in the tables of Appendix B.

The DNOs collectively commissioned EA Technology Limited to build a suite of 25 Excel-based models that replicate the functionality in the Common Methodology. These were used by the DNOs to calibrate the draft Methodology against existing DNO models using both random test and representative sample data across the range of model types.

Each asset type subject to the Common Methodology has been reviewed in light of these exercises following discussion and agreement at the CNAIM Working Group. The changes vary by asset type and factor but include;

- The adjustment of individual factor weights where these were found to be excessively or inadequately weighted compared to the consensus view;
- The addition or removal of criteria within factors where these were found to be missing or superfluous;
- The introduction, removal or adjustment of cap and collar scores on condition input factors to reflect critical defects or measurement results;
- Input to the enhanced descriptions of the criteria included in response to Action 8 below;
- A revision to the true-up mechanism to mitigate the accelerant effects on young assets; and
- A change in the Health Score to Health Index mapping to broaden the HI4 category and compress HI2 and HI3.

As a consequence of the last change, the lower bound of HI3 now corresponds with the point when an asset reaches its Expected Life in years. Additional data on the condition of the asset is required to increase the score beyond this point.

2. Run a validation exercise. Calculate the risk for certain assets and compare the answer to known risks across the network. Present the results in Chapter 4 or in a supporting document and update the tables in Appendix B, where appropriate.

The DNO calibration exercises noted above highlighted areas where the Methodology results did not correspond with previous risk assessments carried out by companies. As a consequence, changes have been made where appropriate, eg to the weighting of the proximity factor for oil-filled cables due to the highlighted sensitivity of the model to this dominant factor and changes to the woodpole factors to better reflect ESQCR risk assessments.

In addition, collective validation was undertaken using substantial combined DNO data sets on woodpoles and oil-filled cables to check the robustness of the methodology to multi-DNO inputs and to ensure that the aims of the methodology (eg that the same asset in the same location attracts the same HI, irrespective of its location within the country) have been met. Details of this exercise and its results are included as Appendix 2 to this letter.

3. Provide further information on risk (Chapter 5), focusing on risk reporting and risk trade-off between assets.

Chapter 5 has been generally updated to provide a clearer discussion on the treatment and assessment of risk within the Methodology. Risk reporting is facilitated by the Methodology, but specified within the relevant Regulatory Instructions and Guidance (RIGs) documents. DNOs are concerned not to duplicate these requirements in the Methodology; however Chapter 5 now includes a description of the conversion of actual PoF and CoF scores into the relevant Health Index and Criticality Index Bands used for regulatory reporting.

The Chapter also includes a discussion on the values used to multiply out the Risk Matrices to produce Monetised Risk scores, including references as appropriate to the Network Assets Workbook and RIGs Annex D – Secondary Deliverables reporting. It highlights that the values used to multiply out the Health Scores are mastered in the Methodology; whilst those used to multiply out the Criticality bands are mastered in the Network Assets Workbook.

4. Following SLC51 Part I, define the document management process for updating the common methodology, including version control.

The Common Methodology is subject to the change control process set out in SLC51 Part I. This is now acknowledged at the front of the Methodology and a version control summary table added such that any printed version will be easily identified. An appropriate footer has also been included in the document.

5. Provide further information on asset health assessment (Chapter 4), to ensure innovations in operation and maintenance can be assimilated.

Chapter 4 has been generally updated and a new section added (4.6) explaining how innovation is accommodated within the Methodology. In terms of innovation in health measurement, this is facilitated by ensuring that the definitions of the health assessment terms do not prescribe the method of measurement, but allow DNOs to map different assessment techniques to a commonly calibrated scale of adjustment factors.

6. Provide reference/source of data (where appropriate).

References have been provided and updated throughout, including to original research papers where appropriate.

7. Provide further information on how the methodology takes into account the interdependence of network assets (Chapter 7).

'Interdependent' failures are taken account of indirectly via the failure rates used in the calculation of K-Value of the PoF as they will be included within the historic data. The Methodology also explicitly considers Network Performance impacts for EHV and higher voltage assets where the probability of coincident faults is considered in the derivation of the Reference cost. This is discussed in section 7.6.3 and quantified on table 225.

8. Based on the results of the calibration exercise, define or provide guidance for the health assessment terms used in Appendix B in the following Tables: 32, 34-36, 38-39, 41, 42, 44-46, 48, 51-53, 56-58, 61-62, 64, 67, 68, 70, 72-93, 97, 101, 110, 116-125, 127, 166, 173. Focus on the critical terms that cause unjustified inconsistencies between DNOs assets.

As part of the revision process we have reviewed the previous definitions and provided new ones where they were previously missing. This process has identified which tables require quantified criteria (typically those relating to Measured Condition factors), and those where a generic descriptor is appropriate. Where the latter has been used, care has been taken to include sufficient examples or criteria within the definition to minimise the risk of mis-interpretation whilst still allowing company discretion in terms of measurement process. Companies are expected to set out how they have mapped their

individual data sets to the criteria specified in the Common Methodology within their individual methodology statements.

9. Provide further explanation of the incipient and degraded failure definitions, focusing on the distinction between these two asset types of failure in terms of calculating the probability of failure.

Further definition of the failure types considered has been included in section 4.2 which covers the definition of failure in the terms understood by the Methodology. Examples of each type of failure by asset type have been included as Appendix A within the Methodology.

An expanded description as to how these different failure modes have been considered in the calculation of Probability of Failure (PoF) values has been included in section 6.1.2 of the Methodology.

10. Provide worked examples for the methodology, as part of the supporting documentation.

A range of worked examples have been developed and included as Appendix E to the Methodology. These take the form of 'walk-through' calculations for individual asset assessment and show how the different elements of the methodology are used to create current and forecast future Health and Criticality scores. The examples have been selected to demonstrate the different aspects of the Methodology for;

- The relative impacts of age and condition on the Health Score;
- The operation of the different criticality factors;
- The different effects of both on overhead line and plant assets;
- The combination of Health Scores (for transformers); and
- The different treatment of Network Performance (for EHV and above assets compared to LV&HV).

11. Provide further explanation on how probability of failure is derived for linear assets.

This has been included in the introductory section on the derivation of key values for the calculation of Probability of Failure (PoF) – 6.1.2. The key metric is failures per km per annum.