Information Gathering Plan – LPN

UK Power Networks

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Contents

1 Introduction

1.1 Purpose of Document

Condition 51 of Electricity Distribution Standard License Conditions requires London Power Networks plc to establish and follow an Information Gathering Plan to ensure appropriate information is available to enable the assessment of its Network Assets and Distribution System against Network Asset Indices and its performance against Network Asset Secondary Deliverables. London Power Networks plc intends to review and update this Information Gathering Plan on an annual basis in August following its annual July RIGs submission.

Network Asset Indices are calculated using the DNO Common Network Asset Indices Methodology (CNAIM). Data is extracted and mapped from a number of UK Power Networks systems in order to populate the CNAIM Models. The data flow is shown in Figure 1 below:

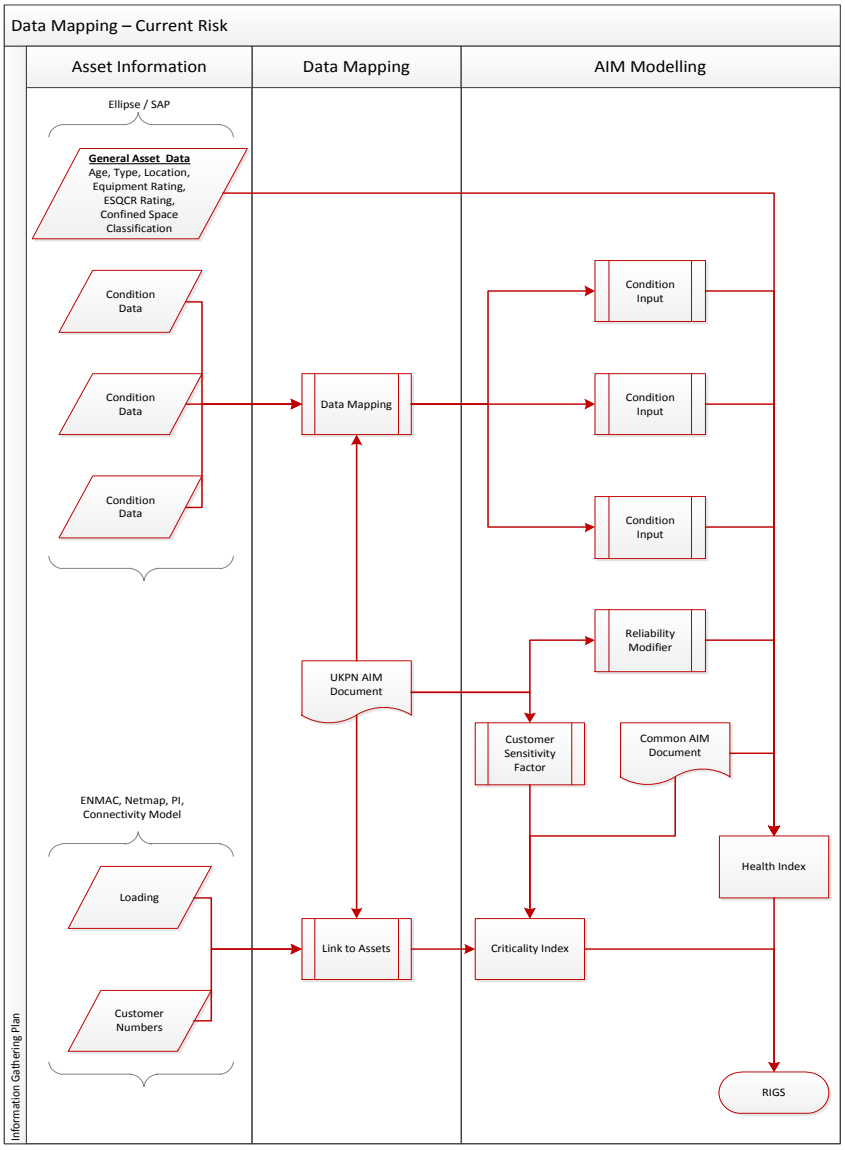

Figure 1. CNAIM Data Flow

1.2 Scope

The Information Gathering Plan is a “living document” which will be maintained to reflect London Power Networks Plc current position and future plans with regards to CNAIM data quality.

The document contains analyses of the CNAIM model data upload files, which are created via data extraction and transformation from a number of business systems. Completeness, Accuracy and Timeliness (CAT) Scores are calculated for the data contained in these data upload files.

A sensitivity analysis has been carried out on the CNAIM condition inputs and duty factors. This sensitivity analysis is used in conjunction with the CAT scores to inform a data improvement plan for each Health Index Asset Category.

The present and future data flows of the CNAIM models are also covered.

1.3 Definition of Terms

Please refer to the DNO Common Network Asset Indices Methodology v1 document Section 1 – Glossary for definition of terms used in this document.

Additional Terms

Term	Description
AMP	EA Technology CNAIM model upload interface database
SSIS	SQL Server Integration Services

2 Information Requirements

The information requirements are driven both internally and externally.

2.1 External Requirements

As a Distribution Network Operator Licensee, London Power Networks plc has to comply with its licence conditions.

Licence Condition 46

Ofgem relies on Regulatory Instructions and Guidance (RIGs) as the main reporting mechanism to monitor and evaluate DNO licensee's performance against the agreed performance outputs set out in the RIIO-ED1 price control review.

The Secondary Deliverables reporting pack is used by UK Power Networks to report on current and future movements in the Health and Criticality profiles of the population of assets within an Asset Category. Health and Criticality Indices are calculated using the Common Network Asset Indices Methodology, which has been defined by all UK DNOs and approved by Ofgem.

Licence Condition 51

Condition 51 Part E includes multiple clauses which specify the regulatory requirements regarding the delivery timeframe for the Information Gathering Plan and Ofgem's acceptance criteria with regards to content:

51.12 The licensee must provide the Authority with a plan (the "Information Gathering Plan") that sets out how the licensee will gather and record information required for its implementation of or revision of the Common Network Asset Indices Methodology, no later than 12 weeks after the Authority's approval or direction of the Common Network Asset Indices Methodology.

51.14 The Information Gathering Plan must include the scope and form of the data that the licensee will collect, and the frequency with which data will be collected, such that the licensee will be able to report on progress against its Network Asset Secondary Deliverables in accordance with the Common Network Asset Indices Methodology annually, in accordance with the RIGs.

51.16 The licensee must keep the Information Gathering Plan under review and where necessary modify it, subject to the Authority's consent, to ensure that it continues to enable the licensee to report accurately on the progress of its Network Asset Secondary Deliverables.

Condition 51 also requires the licensee to establish a framework for reporting its performance against the Network Asset Secondary Deliverables.

2.2 Internal Requirements

Asset Management

The following considerations have been made in developing the asset lifecycle strategy[1]:

- Assets are provided on the basis of lowest whole-life cost, acceptable performance and functionality; account being taken of energy efficiency.
- Due consideration is given to the environmental impact of all decisions and actions.
- Residual lives of existing assets are determined on functional and economic basis.
- Expenditure on individual assets is co-ordinated to minimise ownership costs.
- System security levels are maintained.
- Where justified, performance levels are improved (contributing to reducing minutes lost and/or interruptions per connected customer).
- Assurance of public and operator safety.
- Statutory requirements are met
- Adoption of world-wide best practices.

To fulfil its strategy, UK Power Networks continues to maintain and improve the relevant data quality and information integrity.

[1] Refer to Network Outputs 2014 Commentary for details

3 Data Architecture of CNAIM Modelling

The following section explores the data architecture of UK Power Networks CNAIM modelling from both data storage and data flow perspectives.

3.1 Data Sources

Various enterprise solutions are deployed at UK Power Networks to store its asset and network information for daily operation and long term investment planning. These systems are governed by comprehensive business processes and operational procedures to ensure their data integrity.

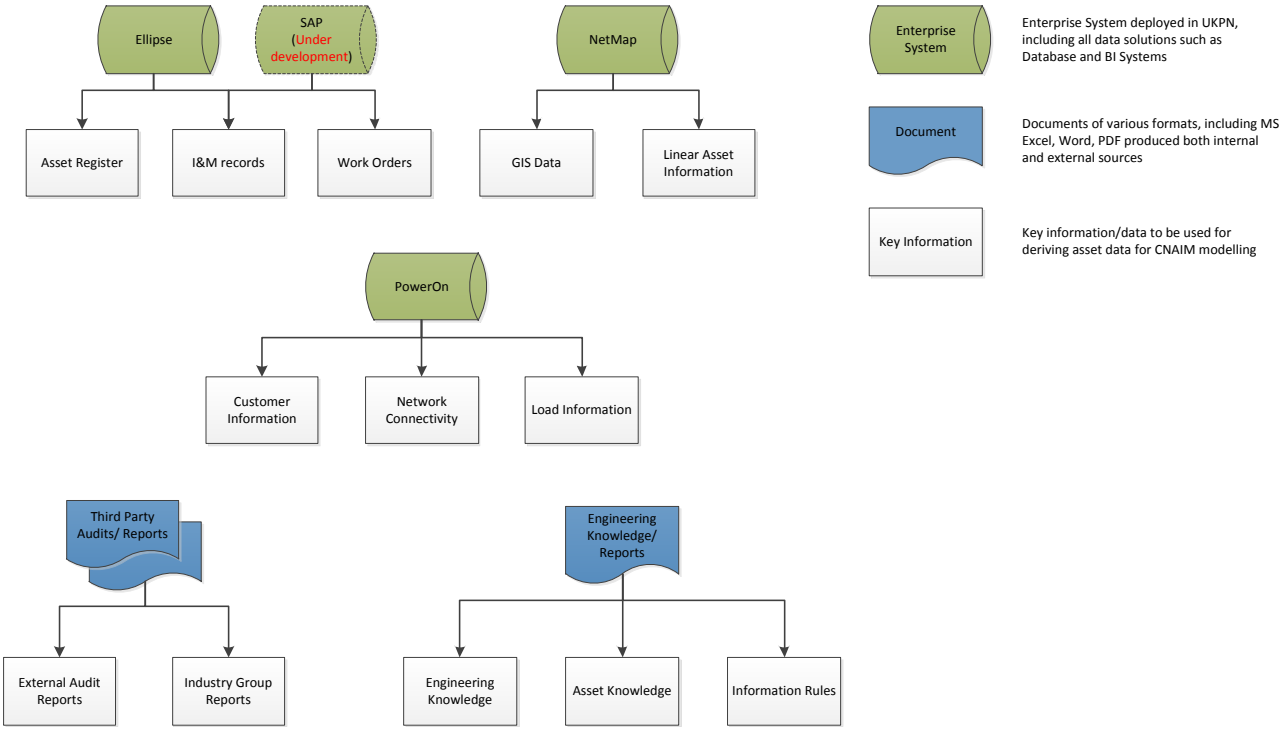

Figure 2. Data Sources for CNAIM models

The CNAIM models require asset data stored in various UK Power Networks systems. These could be extracted directly from enterprise systems, derived from specialist engineering knowledge and experience or third party audits and reports. Figure 2 shows the key data sources relevant to the CNAIM modelling.

3.2 CNAIM Modelling Data Flow

UK Power Networks has been an industry leader in asset risk modelling with Asset Risk & Prioritisation (ARP) models and its modelling framework, We have been chairing the working group to develop the CNAIM modelling methodology with all UK DNOs. A sustainable solution has been developed and deployed for its Asset Risk & Prioritisation (ARP)

risk modelling framework. UK Power Networks will leverage on its previous asset modelling experience and develop a sustainable solution for its CNAIM modelling.

UK Power Networks is currently undertaking a Business Transformation Programme to migrate its Enterprise Asset Management system from Ellipse to SAP. To avoid duplicated efforts in implementing the data flow solution, UK Power Networks has devised two work streams to implement the sustainable CNAIM modelling in stages. Work stream 1 aims to provide rapid data scripting development to allow UK Power Networks to provide CNAIM model outputs for the RIIO – ED1 NAW re-baselining. Work stream 2 aims to develop a long term sustainable solution which integrates both legacy Ellipse and new SAP EAM systems using automated data flow. Work stream 2 will provide a fully automatic data flow which enforces process sustainability, data integrity and allows integration with other enterprise systems. A re-mapping exercise will be conducted after the Ellipse to SAP migration is completed; there are no planned material changes. Any material changes arising from the system changeover will be captured as part of the RIGS reporting in the Secondary Deliverables Reporting Pack.

Work Stream 1

To ensure regulatory compliance and prepare for the development of a long term and sustainable CNAIM modelling solution (detailed in Work Stream 2), Work Stream 1 has been in progress since 1st October 2015 and is scheduled to complete on 1st September 2016. The main objectives of Work Stream 1 are:

- Understand and clarify data scope for CNAIM models
- Investigate data quality of inputs required by the CNAIM models
- Develop data mapping rules (documented in Data Item Specifications) between UK Power Networks source data points and CNAIM inputs
- Create SQL data scripts to extract CNAIM model inputs (in csv format)
- Develop Data Quality Reporting using the existing CAT scoring methodology
- Prepare and plan the data architecture and solution for Work Stream 2
- Prepare asset HI and CI profiles for RIGs secondary deliverables reporting
- Carry out model sensitivity analysis
- Carry out manual asset association between Corporate systems (between EAM and PowerOn, EAM and Netmap, EAM and External data sources)

The Work Stream 1 specific process or system (shown in amber) can be seen in Figure 3.

Work Stream 2

A fully automated modelling and reporting framework will be developed and implemented during Work Stream 2 from 1st Jan 2017 to 1st Dec 2017. This solution will be developed based on the data mapping rules initially captured in Work Stream 1. The main objectives of Work Stream 2 are:

- Integrate EAM data source from both Ellipse and SAP
- Development of automated data flow to extract, transform and load UK Power Networks source data into the CNAIM modelling database
- Integrate CNAIM model outputs with existing RIGs reporting platform
- Develop automated Data Quality Report to safeguard CNAIM model input data quality
- Create CNAIM model governance documents

- Usage Manual
- Live Supporting documents
- Modelling Flow document

The Work stream 2 specific process or system (shown in green) can be seen in Figure 3.

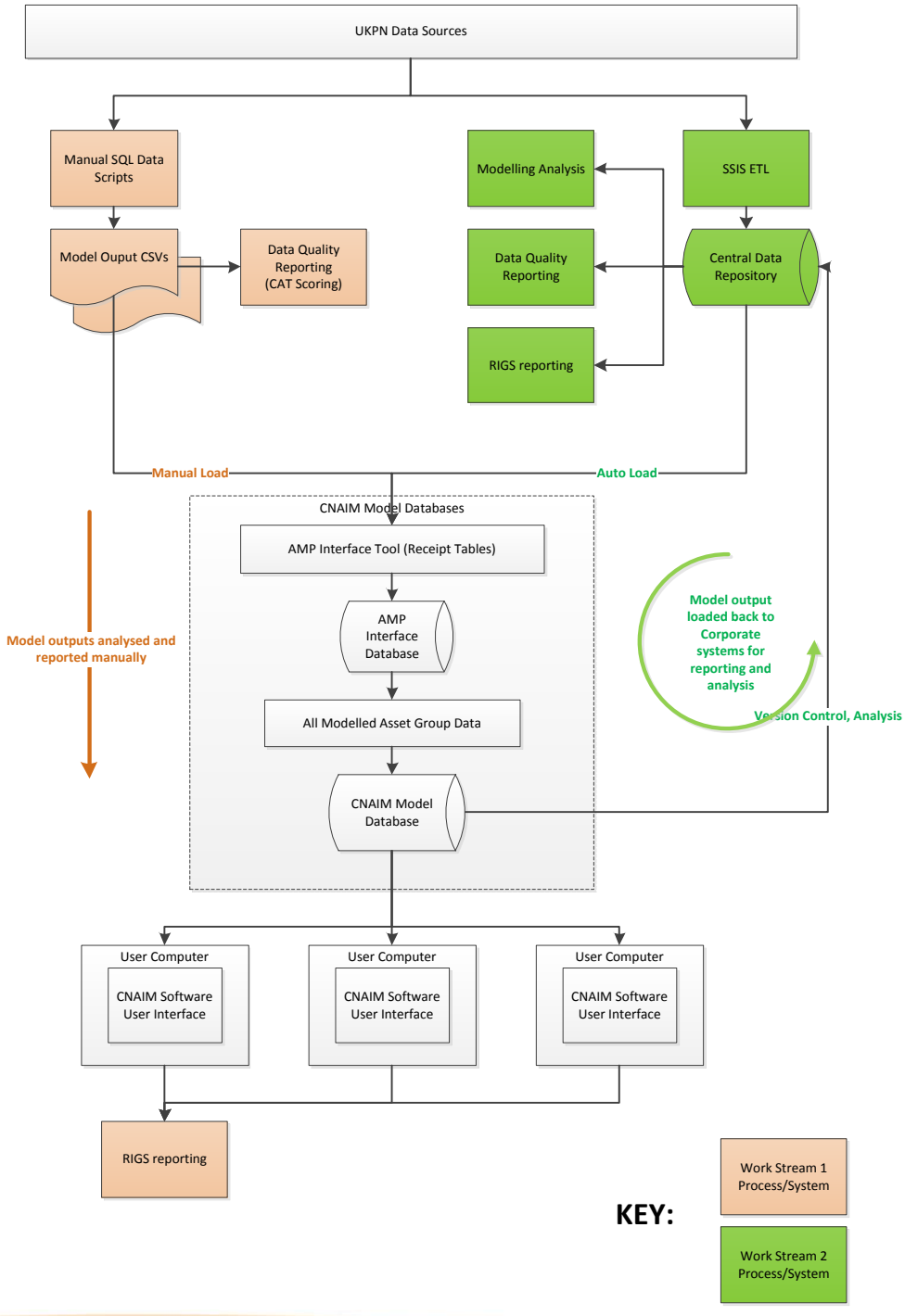

Figure 3. CNAIM models data flow

4 Data Scope

The CNAIM models rely on a number of key data input categories as defined in the DNO Common Network Asset Indices Methodology Process Overview[2], refer to Figure 4 below. The Health Score and Probability of Failure of an asset are calculated based on Location Factor, Duty Factor, Health Score Modifier and Reliability Modifier. The Consequences of Failure is calculated based on asset's Financial, Safety, Environmental and Network Performance Consequences. The CNAIM models also require General Information for each of the assets to allow engineers to identify the assets.

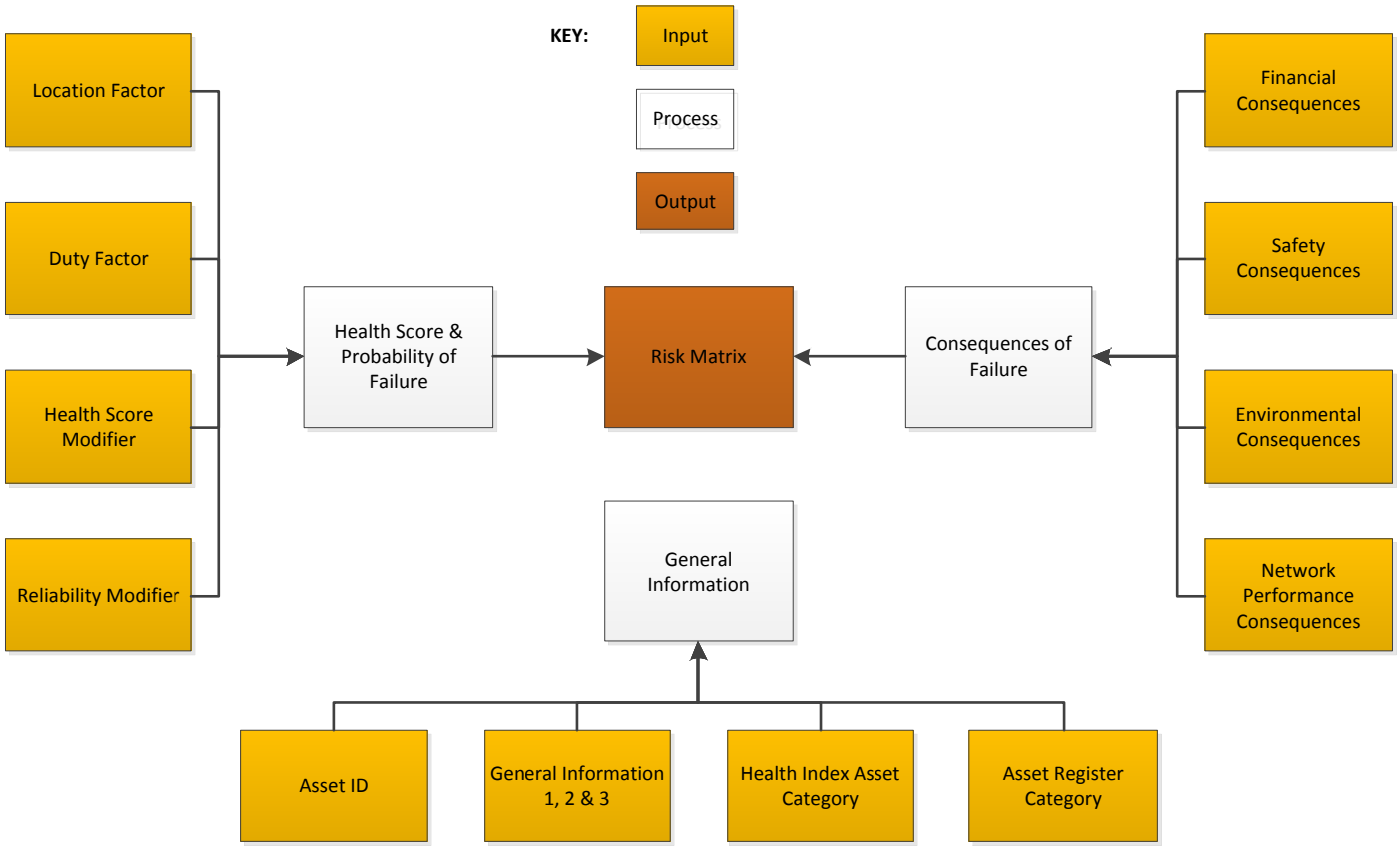

Figure 4. CNAIM Process Overview

The detailed definition of each of the data inputs can be found in the DNO Common Network Asset Indices Methodology document.

[2] This figure is based on Figure 1 of DNO Common Network Asset Indices Methodology v1 document, General Information is added to recognise key asset identification inputs which are not part of the Risk Matrix calculation.

To ensure the CNAIM models are populated with sufficient data and produce accurate Health and Criticality outputs, UK Power Networks has carried out data mapping exercises to identify the scope, form/format of data and its collection frequency, refer to Appendix A for details.

Probability of Failure (PoF)

Probability of Failure is an evaluation of the likelihood of condition based failure per annum for individual assets. The Health Index (HI) is derived from the Health Score and Probability of Failure (PoF). The PoF of an individual asset is calculated based on the following key input factors.

Location Factor

It is recognised that the asset life expectancy is influenced by the location in which the asset is installed. The CNAIM models require the following data inputs for the location factor:

1. Distance from coast
2. Altitude
3. Corrosion category
4. Environment (indoor/outdoor)

At asset commission or relocation, asset location information (address, GIS point, asset environment and other location attributes) is captured in the EAM system as part of the asset registration process. External data sources, such as corrosion rating map from the Galvanizers Association, are associated with the asset location information to derive location factors.

Duty Factor

It is expected that assets operating below their design capacity will have a longer lifespan. Different asset categories utilise different data measures to inform asset's utilisation, only small amount of asset categories require duty factor input measures (up to 2). *Table 8: Duty Factor Methodology* in the DNO Common Network Asset Indices Methodology document specifies the type of asset data points that can be used.

The asset categories which require Duty Factor input measures are:

- Cables: % Utilisation, Operating Voltage ÷ Design Voltage
- Switchgear – HV Primary: Number of Operations
- Switchgear – EHV & 132kV: Number of Operations
- HV Transformer (GM): % Utilisation
- Transformers – EHV & 132kV: %Utilisation, Average Number of Daily Tapping Operations

PowerOn is the enterprise Distribution Management System (DMS) for all three DNOs to control and manage its network assets. It allows UK Power Networks real-time access to its assets' telemetric data such as asset loading, switching status, operating voltage/current, etc. The telemetric information is used to derive asset's duty factor inputs. To ensure CNAIM model output stability and consistency, UK Power Networks intend to refresh asset duty factor data annually.

Health Score Modifier

The Health Score Modifier is driven by the Initial Health Score and Health Score Factor. The Initial Health Score is based on asset's age, material type and expected life sub-division. The Health Score Factor is based on an Observed Condition Modifier and a Measured Condition Modifier. UK Power Networks combine multiple measurements and/or observations made during routine asset inspection and maintenance activities to map to an individual condition modifier input.

All network assets and sites are inspected and maintained on a predefined schedule. The schedule can vary based on asset category/type, location type, asset condition and asset risk. EMS 10-0002 Inspection and Maintenance Frequency Schedule can be found in the Appendix B of this document. The inspection and maintenance frequencies are set to allow UK Power Networks to operate its assets with high level of reliability while maintaining asset safety and optimisation of asset whole life costs. UK Power Networks maintains its inspection and maintenance records in the EAM system.

Reliability Modifier

The CNAIM model allows DNOs to apply a reliability modifier to identify assets having a materially different PoF than would be expected for a typical asset of the same category with the same health score. The reliability modifier consists of Reliability Collar and Reliability Factor. These input factors are derived from industry reports, standards or manufacturer notifications.

UK Power Networks reviews these external information sources and derive asset's reliability factors. UK Power Networks documents its asset reliability factors and their relevant reasons on an ad-hoc basis (depending on updates from industry reports, standards or manufacture notifications).

Consequences of Failure (CoF)

The Criticality Index for an asset is derived from the CoF of that asset relative to the average CoF of the population of assets within its asset category. The CoF is the cost (both societal and direct DNO cost) of a condition based functional failure. It is calculated as a financial representation (in British Pound £). There are four elements to consider when assessing CoF: Financial; Safety; Environmental; and Network Performance. The CoF of an individual asset is calculated based on the following key input factors.

Financial Consequences

The Financial consequences refer to the cost of repair or replacement in order to return an asset to its pre-failure state. Typically, costs of planned asset interventions are significantly lower than post-failure interventions due to emergency operational and access arrangements. The individual asset's Financial Consequences are calculated by applying a Type Financial Factor and an Access Financial Factor to the Reference Financial Cost of Failure.

The Type Financial Factor is based on the asset's rating, capacity, material and type information, which is captured in EAM at asset commission. Access Financial Factor is based on routine ESQCR inspections which identify any access issues which would result in a higher than typical replacement cost. These inspections are scheduled according to EMS 10-0002 Inspection and Maintenance Frequency Schedule which can be found in the Appendix B.

Safety Consequences

The Safety Consequences are based on Electricity Safety, Quality and Continuity Regulations (ESQCR) 2002 and associated guidance from the Health and Safety Executive (HSE). It considers the societal costs (cost of 'Lost Time Accident' and 'Death or Serious Injury') resulting from an accident, serious injury or fatality caused by asset failure. The individual asset's Safety Consequences are calculated by applying a Type Safety Factor and Location Safety Factor to the Reference Safety Cost of Failure.

Type Safety Factor addresses the safety aspect related to the type of asset, for instance, type of insulation medium. Such information is captured at asset commission, relocation and reconstruction and stored in EAM system.

Location Safety Factor identifies the risk of public exposure due to the nature and situation of the adjacent land through routine ESQCR inspections. These inspections are scheduled according to EMS 10-0002 Inspection and Maintenance Frequency Schedule which can be found in the Appendix B.

Environment Consequences

The Environment Consequences caused by an asset failure are derived with reference to relevant environmental regulations and policies. Depending on the asset category, asset failure can cause leakage of oil and SF_6 gas, fire damage to property, emits CO_2 and generates waste materials. The individual asset's Environment Consequences are calculated by applying a Type Environmental Factor, Size Environmental Factor and Location Environmental Factor to the Reference Environmental Cost of Failure.

At asset commissioning, asset insulation medium (Oil, SF_6, Vacuum, etc.), its volume and asset construction type (oil bund) are captured in the EAM system and used to derive the Type Environmental Factor and Size Environmental Factor respectively. Location Environmental Factor is derived based on asset's proximity to water course and whether the asset is bunded or not. Proximity to water course is derived from asset's GIS reference (captured at asset commission and relocation in EAM) and mapping to external GIS data sources. Asset construction (bunded or not) is captured at asset commissioning in EAM.

Network Performance Consequences

The Network Performance Consequences are calculated based on:

- the IIS mechanism for LV and HV assets (based on Customer Interruptions & Customer Minutes Lost)
- Load at Risk for EHV and 132kV assets (based on Value of Lost Load)

For LV and HV assets, the individual asset's Network Performance Consequences are calculated by applying a Customer Factor and a Customer Sensitivity Factor to the Reference Network Performance Cost of Failure. The Customer Factor is calculated based on the Number of Connected Customers and kVA Band per Customer. Customer Sensitivity Factor is derived using a vulnerable customer flag recorded (upon application accepted from customer) against their individual MPAN.

For EHV and 132kV assets, the individual asset's Network Performance Consequences are calculated by applying a Load Factor and a Network Type Factor to the Reference Network Performance Cost of Failure. The Load Factor is driven by the Maximum Demand of the substation associated with the asset. The Network Type Factor is derived from Engineering Knowledge of whether or not the load supplied by the associated substation is secure.

All of these input measures are derived from the network connectivity model (using normal running arrangement), connected MPAN and asset loading information held in UK Power Networks' PowerON system. To ensure CNAIM model output stability and consistency, UK Power Networks intend to refresh customer and load data annually.

General Information

General Information data points are not used for any CNAIM model calculations and they will not have any effects on the model outputs. They are included to allow model users to identify the assets in the CNAIM models. Each CNAIM model allows one asset ID and three general information fields. The general information tends to be static information which is captured at asset commissioning and relocation in EAM system.

4.1 Data Scope Assessment

UK Power Networks is committed to reporting risk matrices for the Health Index Asset Categories shown in Table 1 below. When carrying out this data scope assessment, asset categories of similar type and configuration are grouped together to reduce repeated assessments. For example, the mapping and extraction rules used for LV OHL Support, HV OHL Support – Poles and EHV OHL Support – Poles are identical to each other.

Data Availability Assessment

In order for the CNAIM model to calculate a Health and Criticality index for an asset, the minimum data requirement is that the model be provided with the age of the asset. All other data inputs will be set to default values if no data is provided. However, where defaults are used due to a lack of data, the accuracy of the model output is decreased.

For linear assets, in order for an asset to be represented in the Risk Matrix model output, it is also necessary to provide a length (no. of units).

UK Power Networks holds all essential data necessary to run the CNAIM model. Work is currently underway to associate the vector information in NetMap to the Asset Register in order to improve the quality of the length data prior to the December re-baselining of the ED1 NAW.

PoF Data

There is sufficient condition and defects data available to populate the dominant inputs within the CNAIM models and provide a range of Health Indices from HI1 to HI5.

CoF Data

UK Power Networks holds sufficient information to enable the dominant factors to be populated in the Financial, Safety, Environmental and Network Performance CoF calculations for all asset categories. For Network Performance CoF, a programme of work is currently underway to associate the Asset Register Data to the Customer Number and Maximum

Demand Data held within PowerOn. This work will be completed prior to the December re-baselining of the ED1 NAW, resulting in an improved Completeness Score in *Table 2. LPN CAT Scores*.

Health Index Asset Category	EA Technology Model ID	Data Scope Assessment Grouping	Data Available to implement CNAIM
LV UGB	M2	LV UGB	Yes
LV Switchgear and Other	M3	LV Switchgear and Other	Yes
HV Switchgear (GM) – Primary	M5	HV Switchgear (GM)	Yes
HV Switchgear (GM) – Distribution	M6	HV Switchgear (GM)	Yes
HV Transformer (GM)	M7	HV Transformer	Yes
EHV OHL Conductor (Tower Lines)	M10	OHL Conductor (Tower Lines)	Yes
132kV OHL Conductor (Tower Lines)	M19	OHL Conductor (Tower Lines)	Yes
EHV OHL Fittings	M9	OHL Fittings	Yes
132kV OHL Fittings	M18	OHL Fittings	Yes
LV OHL Support	M1	OHL Support – Poles	Yes
HV OHL Support – Poles	M4	OHL Support – Poles	Yes
EHV OHL Support – Poles	M8	OHL Support – Poles	Yes
EHV OHL Support – Towers	M11	OHL Support – Towers	Yes
132kV OHL Support – Tower	M20	OHL Support – Towers	Yes
EHV UG Cable (Gas)	M12	UG Cable (Fluid Filled)	Yes
EHV UG Cable (Oil)	M14	UG Cable (Fluid Filled)	Yes
132kV UG Cable (Gas)	M21	UG Cable (Fluid Filled)	Yes
132kV UG Cable (Oil)	M23	UG Cable (Fluid Filled)	Yes
EHV Transformer	M17	EHV & 132kV Transformer	Yes
132kV Transformer	M25	EHV & 132kV Transformer	Yes
EHV Switchgear (GM)	M16	EHV Switchgear and 132kV Circuit Breakers	Yes
132kV CBs	M24	EHV Switchgear and 132kV Circuit Breakers	Yes

Table 1. UKPN CNAIM Modelling Categories

The following asset categories have not been included in the assessment:

- EHV UG Cable (Non Pressurised) - HI not reported
- Submarine Cables - No asset of this type deployed on the network
- 132kV UG Cable (Non Pressurised) - HI not reported

UK Power Networks has carried out full data scope assessment on all CNAIM input measures, the summary of the data quality of individual CNAIM models is provided in *Section 5.1 CAT Scoring* below. Based on this assessment, UK

Power Networks has proposed to improve its CNAIM model data quality using three approaches. These are documented in *Section 6* of this document.

All data assessed below was extracted for testing purpose between 1st Jan 2016 and 12th April 2016. UK Power Networks will continue to refine the data mapping rules to improve data quality and availability.

5 Data Quality Assessment

UK Power Networks places significant emphasis on its data integrity and implements various measures at different stages of the data life cycle to ensure high data quality is achieved. The three subsections below describe the relevant processes put in place to ensure the accuracy of UK Power Networks asset modelling outputs.

5.1 CAT Scoring

As part of the RIIO-ED1 submission in 2013, UK Power Networks introduced data quality measures (CAT scores) on its asset modelling data in the Asset Stewardship Reports. It has proven to be a valuable assessment of the asset information/data feeding into the asset models. The data quality measures are based on three key measures: Completeness, Accuracy and Timeliness. Each of these measures allows UK Power Networks to control and measure the quality of the data feeding the asset models.

A high level description of CAT scoring can be found below:

- **Completeness Score** – This is a measure to assess the completeness of ALL data points used by the CNAIM modelling. Not all CNAIM data points are used by UK Power Networks, this does not compromise the integrity and accuracy of the CNAIM model outputs. The completeness score is carried out on validated data only.

- **Accuracy Score** – The Accuracy score is based on the score difference between internal inspector's asset condition evaluations and asset condition evaluations undertaken by third party independent consultant SKM. The measure focuses on asset condition and defect data only. The independent audit report, which was carried out on plant assets only, can be found in Appendix C of this document.

- **Timeliness Score** – The Timeliness score measures the timeliness of asset inspections against the inspection frequencies defined in the Inspection and Maintenance Frequency Schedule[3].

UK Power Networks has deployed the CAT scoring methodology for the new Common Network Asset Indices Methodology to ensure high level of data quality for the new models.

The latest CAT scores against the test CNAIM model input data are tabulated below.

[3] Engineering Maintenance Standard EMS 10-0002 Inspection and Maintenance Frequency Schedule version 6.0 covers the frequencies of work for the three licensed networks within UK Power Networks, relating to inspection and maintenance of electrical and civil plant and equipment on the distribution system and its associated control, protection and indicating equipment.

Health Index Asset Category	RIGS V1 Volume 2014/2015	Completeness Score	Accuracy Score	Timeliness Score
LV Networks				
LV OHL Support	2	84%	N/A	100%
LV UGB	47,555	80%	N/A	92%
LV Switchgear and Other	26,812	64%	N/A	88%
HV Networks				
HV OHL Support - Poles	N/A	N/A	N/A	N/A
HV Switchgear (GM) – Primary	3,664	71%	89%	99%
HV Switchgear (GM) - Distribution	20,548	74%	89%	95%
HV Transformer (GM)	15,268	85%	89%	96%
EHV Networks				
EHV OHL Support – Poles	N/A	N/A	N/A	N/A
EHV OHL Fittings	56	82%	N/A	100%
EHV OHL Conductor (Tower Lines)	15	62%	N/A	100%
EHV OHL Support – Towers	28	82%	N/A	100%
EHV UG Cable (Gas)	21.5	100%	N/A	N/A
EHV UG Cable (Oil)	595	81%	N/A	N/A
EHV Switchgear (GM)	533	72%	89%	93%
EHV Transformer	285	89%	89%	96%
132kV Networks				
132kV OHL Fittings	30	76%	N/A	100%
132kV OHL Conductor (Tower Lines)	7	76%	N/A	100%
132kV OHL Support - Tower	16	89%	N/A	100%
132kV UG Cable (Gas)	55.1	91%	N/A	N/A
132kV UG Cable (Oil)	211	84%	N/A	N/A
132kV CBs	214	68%	89%	81%
132kV Transformer	186	88%	89%	98%

Table 2. LPN CAT Scores

Key
Green/High – Score of 80% or greater
Amber/Medium – Score of 60% to 80%
Red/Low – Score of less than 60%

The CAT score outputs show a strong score for UK Power Networks CNAIM modelling data accuracy and timeliness. The strong position in these two CAT score measures should allow UK Power Networks asset engineers high confidence when using the CNAIM models. When compared to previous CAT scores, completeness scores for high risk asset categories have improved significantly. For example, LV UGB has been a primary focus for the past three years; to mitigate public risks, UK Power Networks has increased LV UGB inspections frequency and implemented ad-hoc asset inspection programmes to improve data completeness. As a result, the completeness score for LPN LV UGB has increased from 73%[4] to 80%.

Whereas the ARP tool was developed specifically for UK Power Networks taking into account our specific inspection policies, the CNAIM Model has been created in order to take account of the data collected by all DNOs. Achieving a 100% Completeness Score will therefore (generally speaking) not be possible without a change in inspection policy. However, due to the effect of the Max. No. of Combined Factors within the MMI calculation, collecting information over and above this number of factors will have a limited effect on the model output where the "stronger" factors have a valid data mapping.

It is important to note that the Completeness Scores shown above are calculated at the data upload interface which sits between UK Power Networks information systems and the Common Model. The results are calculated using all Common Model Inputs, most of which UKPN have data to map to. Where a Common Model Input is currently empty at the data upload interface, this is not usually because UKPN do not possess the data in question, but more often due to the fact that no asset association currently exists between the various Enterprise Systems shown in Figures 1 and 2. The following are examples of where UKPN possess data which is not currently reflected in the CAT Scores:

1. Partial Discharge

Over the past 10 years, UK Power Networks have been actively involved in the development of online partial discharge monitoring and mapping techniques - http://www.smarternetworks.org/Project.aspx?ProjectID=600. This project has developed equipment to continuously monitor Partial Discharge activity in switchgear. This data is assessed by our Asset Engineers, using a web based system hosted by iPEC Ltd, and used to inform the Asset Management plan. However, no association currently exists between the UK Power Networks Asset Register and the iPEC system.

2. Customer Sensitivity Factor

UKPN maintains a count of Vulnerable Customers within PowerOn for the reporting of Customer Interruption and Customer Minutes Lost. Work is underway to populate the CNAIM Models with this data and so the Completeness Score is currently 0% for this Factor for all Asset Categories in all Licence Areas. This score will significantly improve by the December re-baselining of the ED1 Network Asset Indices once the data is populated.

3. Maximum Demand

Network Loading Information is stored in PI Limes at 30 minute intervals. These 30 minute telemetry readings are downloaded annually and the profiles manually analysed to remove any artificial spikes caused as a result of abnormal network running conditions. The temperature adjusted maximum is then published in the Planning Load Estimate (PLE)

[4] Data taken from LPN Asset Stewardship Report 2013

by Site Name (not by Asset) for EHV and 132kV Sites down to the HV Primary Switchgear. Due to the number of telemetry points and the unpredictability of abnormal conditions, this is an onerous process and challenging to automate. The Asset Association between the PLE and Asset Register does not currently exist and needs to be sustainably developed.

4. kVA per Customer

This is an adjustment to the No. of Customers used when calculating the Customer Factor within the Network Performance CoF for a LV or HV asset. The Maximum Demand on the asset forms part of the calculation. At these voltage levels, the Maximum Demand is recorded by the UK Power Networks inspectors by checking the Maximum Demand Indicator of the Distribution Transformer during a substation inspection. This data is currently captured within the HV Transformer (GM) model and this is reflected in the Completeness Score. For other LV and HV Asset Categories, the Completeness Score is expected to significantly improve by the December ED1 Network Asset Workbook re-baselining as the Transformer data is mapped to the associated HV and LV assets.

Details of areas where UK Power Network intend to improve the model data quality can be found in the Improvement Plan in *Section 6*.

6 Improvement Action Planning

To continuously improve the CNAIM model data quality, UK Power Networks developed the following improvement plans.

6.1 Improvement Plan 1 – Information Association

One of the key improvements required to further improve UK Power Networks' CNAIM modelling data quality is to establish better asset association amongst its corporate systems and between corporate EAM and external data sources. The two tables below provide the improvement actions against individual measures which can be improved with better asset associations. By improving the asset association, UK Power Networks shall be able to improve data population on factors affecting Network Performance Consequences, Duty Factor and Location Factor.

Asset Group	SpecID	Data Point Description	Data Improvement Plan	Method of collection	Resourcing	Timescale
EHV Switchgear (GM) , 132kV CBs	M16DI32, M24DI34	Maximum Demand	1. Carry out manual mapping on asset levels between EAM and PowerOn as part of Works Stream 1 project 2. Load manual mapping into EAM system and PowerOn 3. Develop automated dataflow for CNAIM data points 4. Develop BAU asset registration process to ensure asset association is	Desktop exercise	Data Analysts, System Integrators	Step 1 and 2 to be completed as part of Work Stream 1, 1st September 2016, Step 3 and 4 to be completed as part of Work Stream 2, 1st December 2017, (refer to *Section 3.2 CNAIM Modelling Data Flow,*)
HV Switchgear (GM) – Primary, HV Switchgear (GM) – Distribution	M5DI31, M6DI29	Number of Connected Customers				
HV Switchgear (GM) – Primary, HV Switchgear (GM) – Distribution	M5DI32, M6DI30	Customer Sensitivity Factor				
HV Switchgear (GM) – Primary, HV Switchgear (GM) – Distribution	M5DI33, M6DI31	KVA Band Per Customer				
HV Transformer (GM)	M7DI26	Customer Sensitivity Factor				

Asset Group	SpecID	Data Point Description	Data Improvement Plan	Method of collection	Resourcing	Timescale
LV Switchgear and Other	M3DI29	Number of Connected Customers	maintained as part of Work Stream 2 project			
LV Switchgear and Other	M3DI30	Customer Sensitivity Factor				
LV Switchgear and Other	M3DI31	KVA Band Per Customer				
LV UGB	M2DI20	Number of Connected Customers				
LV UGB	M2DI21	Customer Sensitivity Factor				
LV UGB	M2DI22	KVA Band Per Customer				
EHV UG Cable (Oil), 132kV UG Cable (Oil)	M12DI18, M21DI18, M14DI19, M23DI19	Maximum Demand				
EHV UG Cable (Oil), 132kV UG Cable (Oil)	M12DI7, M21DI7, M14DI7, M23DI7	% Utilisation				
LV OHL Support, HV OHL Support – Poles, EHV OHL Support - Poles	M1DI26, M4DI25,	Number of Connected Customers				
LV OHL Support, HV OHL Support – Poles, EHV OHL Support - Poles	M1DI27, M4DI26	Customer Sensitivity Factor				
LV OHL Support, HV OHL Support – Poles, EHV OHL Support - Poles	M1DI28, M4DI27	KVA Band Per Customer				

Asset Group	SpecID	Data Point Description	Data Improvement Plan	Method of collection	Resourcing	Timescale
EHV OHL Conductor (Tower Lines), 132kV OHL Conductor (Tower Lines)	M10DI23, M19DI23	Maximum Demand				
EHV OHL Conductor (Tower Lines), 132kV OHL Conductor (Tower Lines)	M10DI24, M19DI24	Network Type				
EHV OHL Support – Towers, 132kV OHL Support - Towers	M11DI29, M20DI29	Maximum Demand				

Table 3. Improvements on Corporate system association (EAM – PowerON)

Asset Group	SpecID	Data Point Description	Data Improvement Plan	Method of collection	Resourcing	Timescale
EHV OHL Conductor (Tower Lines), 132kV OHL Conductor (Tower Lines)	M10DI19, M19DI19	No of Units	1. Investigate asset linear length using different systems (both internal and external) 2. Establish sustainable data association between EAM and data sources (internal or external) 3. Load asset length into EAM	Desktop exercise	Data Analysts	To be completed as part of Work Stream 1, 1st September 2016, (refer to *Section 3.2 CNAIM Modelling Data Flow*)
EHV UG Cable (Oil), 132kV UG Cable (Oil)	M14DI15, M23DI15	No of Units				

Table 4. Improvements on linear asset No. of Units

6.2 Improvement Plan 2 – Onsite Data Collection

For asset attributes which have a low completeness score (refer to *Section 5.1* of this document), UK Power Networks shall carry out onsite data collection, either as part of routine inspections or ad-hoc onsite data collection exercises.

Asset Group	SpecID	Data Point Description	Data Improvement Plan	Method of collection	Resourcing	Timescale
LV UGB	M2DI12	Signs of Heating	1. Review existing asset commission, inspection and maintenance process. 2. Investigate any potential process gaps causing data not captured as part of BAU process. 3. Confirm CNAIM data mapping rules. 4. Carry out data collection via routine On-site Data Collection if required.	Desktop exercise and BAU On-site Data Collection	Asset Engineers, Data Analysts, Asset Inspectors	Based on routine inspection cycle of individual asset categories.
LV UGB	M2DI18	Type Safety Rating				
LV UGB	M2DI19	Location Safety Rating				
EHV OHL Support – Towers, 132kV OHL Support - Towers	M11DI19, M20DI19	Crossarms				
EHV OHL Support – Towers, 132kV OHL Support - Towers	M11DI21, M20DI21	Paintwork Condition				
EHV OHL Support – Towers, 132kV OHL Support - Towers	M11DI22, M20DI22	Foundation Condition				
EHV OHL Conductor (Tower Lines), 132kV OHL Conductor (Tower Lines)	M10DI13, M19DI13	Visual Condition				
EHV OHL Conductor (Tower Lines), 132kV OHL Conductor (Tower Lines)	M10DI16, M19DI16	Corrosion Monitoring Survey				

Asset Group	SpecID	Data Point Description	Data Improvement Plan	Method of collection	Resourcing	Timescale
EHV OHL Fittings, 132kV OHL Fittings	M9DI13, M18DI13	Conductor Fittings Condition				
EHV OHL Fittings, 132kV OHL Fittings	M9DI15, M18DI15	Insulators - Mechanical Condition				
LV Switchgear and Other	M3DI12	LV Pillar - Switchgear External Condition				
LV Switchgear and Other	M3DI14	LV Pillar - Internal Condition & Operation				
LV Switchgear and Other	M3DI16	LV Pillar - Signs of Heating				
LV Switchgear and Other	M3DI18	LV Board - Switchgear External Condition				
LV Switchgear and Other	M3DI20	LV Board - Internal Condition & Operation				
LV Switchgear and Other	M3DI21	LV Circuit Breaker - External Condition				
LV Switchgear and Other	M3DI33	LV Circuit Breaker - Operational Adequacy				
LV Switchgear and Other	M3DI34	LV Board - Operational Adequacy				
LV Switchgear and Other	M3DI22	LV Pillar - Operational Adequacy				
LV Switchgear and Other	M3DI23	LV Board - Security				

Asset Group	SpecID	Data Point Description	Data Improvement Plan	Method of collection	Resourcing	Timescale
HV Switchgear (GM) – Primary, HV Switchgear (GM) – Distribution	M5DI14, M6DI13	Oil Leaks / Gas Pressure				
HV Switchgear (GM) – Primary, HV Switchgear (GM) – Distribution	M5DI16, M6DI15	Switchgear Internal Condition & Operation				
HV Switchgear (GM) – Primary, HV Switchgear (GM) – Distribution	M5DI17, M6DI16	Indoor Environment				
HV Switchgear (GM) – Primary, HV Switchgear (GM) – Distribution	M5DI19, M6DI18	Ductor Test				
HV Switchgear (GM) – Primary, HV Switchgear (GM) – Distribution	M5DI21, M6DI19	Oil Tests				
HV Switchgear (GM) – Primary, HV Switchgear (GM) – Distribution	M5DI23, M6DI21	Trip Test				

Asset Group	SpecID	Data Point Description	Data Improvement Plan	Method of collection	Resourcing	Timescale
EHV Switchgear (GM) , 132kV CBs	M16DI14, M24DI14	Oil Leaks / Gas Pressure				
EHV Switchgear (GM) , 132kV CBs	M16DI16, M24DI16	Switchgear Internal Condition & Operation				
EHV Switchgear (GM) , 132kV CBs	M16DI19, M24DI20	Partial Discharge				
EHV Switchgear (GM) , 132kV CBs	M16DI20, M24DI21	Ductor Test				
EHV Switchgear (GM) , 132kV CBs	M16DI22, M24DI23	Oil Tests / Gas Tests				
EHV Switchgear (GM) , 132kV CBs	M16DI23, M24DI24	Temperature Readings				
EHV Switchgear (GM) , 132kV CBs	M16DI24, M24DI25	Trip Test				
HV Transformer (GM)	M7DI15	Oil Acidity				
HV Transformer (GM)	M7DI16	Temperature Readings				
EHV Transformer, 132kV Transformer	M17DI12, M25DI12	Avg. Number Taps per Day				

Asset Group	SpecID	Data Point Description	Data Improvement Plan	Method of collection	Resourcing	Timescale
EHV Transformer, 132kV Transformer	M17DI18, M25DI18	Bushings Condition				
EHV Transformer, 132kV Transformer	M17DI27, M25DI27	Temperature Readings				
EHV Transformer, 132kV Transformer	M17DI32, M25DI32	Transformer - Oil Breakdown				

Table 5. Improvements via Onsite Data Collection

6.3 Improvement Plan 3 – Policy Review

To ensure best practice, UK Power Networks shall review the CNAIM modelling measures which are not required under the current UK Power Networks asset inspection and maintenance policy. UK Power Networks shall carry out sensitivity analysis and cost benefit analysis to support the asset inspection and maintenance policy review post 2016 CNAIM model implementation. UK Power Networks will define the scope and method of the sensitivity analysis and cost benefit analysis during the policy review. The outputs of these analyses will be included in the future versions of the Information Gathering Plan.

Asset Group	SpecID	Data Point Description	Data Improvement Plan	Method of collection	Resourcing	Timescale
EHV OHL Conductor (Tower Lines), 132kV OHL Conductor (Tower Lines)	M10DI14, M19DI14	Midspan Joints	1. UK Power Networks Asset Management shall review its asset registration, inspection and maintenance policy to ensure best practice is used for collecting, recording and monitoring asset construction,	Desktop exercise	Asset Engineers	Review by end of Work Stream 2, 1st December 2017, (refer to *Section 3.2 CNAIM Modelling Data Flow*)
EHV OHL Conductor (Tower Lines), 132kV OHL Conductor (Tower Lines)	M10DI15, M19DI15	Conductor Sampling				

Asset Group	SpecID	Data Point Description	Data Improvement Plan	Method of collection	Resourcing	Timescale
EHV OHL Fittings, 132kV OHL Fittings	M9DI16, M18DI16	Thermal Imaging	condition and degradation. 2. Carry Cost Benefit Analysis to assess any potential new measures to be introduced 3. Update existing asset inspection policy to incorporate new asset measures if required.			
EHV OHL Fittings, 132kV OHL Fittings	M9DI17, M18DI17	Ductor Test				
HV Switchgear (GM) – Primary, HV Switchgear (GM) – Distribution	M5DI15, M6DI14	Thermographic Assessment				
HV Switchgear (GM) – Primary, HV Switchgear (GM) – Distribution	M5DI20	IR Test				
HV Switchgear (GM) – Primary, HV Switchgear (GM) – Distribution	M5DI35, M6DI33	Bunding				
HV Transformer (GM)	M7DI24	Bunding				
EHV Switchgear (GM) , 132kV CBs	M16DI15, M24DI15	Thermographic Assessment				
EHV Transformer, 132kV Transformer	M17DI19, M25DI19	Kiosk Condition				

Table 6. Improvements via Policy Review

7 Appendix A – Data Scope Mapping

Table 7. LV UGB

HI Asset Category	CNAIM Calculation Step	Data Required	CNAIM Document Reference	Data Collected	Data Source	Data used to provide CNAIM input	Data Type Used	Format of data	Existing data collection policy	Frequency of data collection	Comments
LV UGB	Initial Health Score	Age	Section 6.1.6, Eq. 4	Yes	EAM	Based on Year of Manufacture, Commission Year	Asset commissioning record	Date	One off activity	Captured at asset commission or relocation	
LV UGB	Observed Condition Modifier	Steel Cover & Pit Condition	Appendix B.5.2, Table 34	Yes	EAM	Based on overall asset condition records	Inspection/maintenance record	Inspection Score	Ongoing routine inspection cycle	Captured during routine asset inspection/maintenance according to Inspection and Maintenance Frequency Schedule	
LV UGB	Observed Condition Modifier	Water / Moisture	Appendix B.5.2, Table 35	Yes	EAM	Based on defect records indicating water present inside/outside of bell housing	Inspection/maintenance record	Inspection Score	Ongoing routine inspection cycle	Captured during routine asset inspection/maintenance according to Inspection and Maintenance Frequency Schedule	
LV UGB	Observed Condition Modifier	Bell Condition	Appendix B.5.2, Table 36	Yes	EAM	Based on defect records indicating water ingress, defective structure and defective bell seating	Inspection/maintenance record	Inspection Score	Ongoing routine inspection cycle	Captured during routine asset inspection/maintenance according to Inspection and Maintenance Frequency Schedule	

HI Asset Category	CNAIM Calculation Step	Data Required	CNAIM Document Reference	Data Collected	Data Source	Data used to provide CNAIM input	Data Type Used	Format of data	Existing data collection policy	Frequency of data collection	Comments
LV UGB	Observed Condition Modifier	Insulation Condition	Appendix B.5.2, Table 37	Yes	EAM	Based on defect records indicating incorrect compound level	Inspection/maintenance record	Inspection Score	Ongoing routine inspection cycle	Captured during routine asset inspection/maintenance according to Inspection and Maintenance Frequency Schedule	
LV UGB	Observed Condition Modifier	Signs of Heating	Appendix B.5.2, Table 38	Yes	EAM	Based on temperatures measured inside/outside of bell cover	Inspection/maintenance record	Inspection Score	Ongoing routine inspection cycle	Captured during routine asset inspection/maintenance according to Inspection and Maintenance Frequency Schedule	
LV UGB	Observed Condition Modifier	Phase Barriers	Appendix B.5.2, Table 39	Yes	EAM	Based on asset attribute indicating whether phase barriers are present	Asset commissioning record	Yes/No	One off activity	Captured at asset commission	
LV UGB	Measured Condition Modifier	Operational Adequacy	Appendix B.6.2, Table 131	Yes	EAM	Based on defect records indicating Stalks Misaligned/Burnt and asset flooding	Inspection/maintenance record	Inspection Score	Ongoing routine inspection cycle	Captured during routine asset inspection/maintenance according to Inspection and Maintenance Frequency Schedule	
LV UGB	Reliability Modifier	Reliability Factor Input	Section 6.14	Yes	EAM	Based on Linkbox material type and number of	Asset commissioning record	N/A	One off activity	Captured at asset commission	

HI Asset Category	CNAIM Calculation Step	Data Required	CNAIM Document Reference	Data Collected	Data Source	Data used to provide CNAIM input	Data Type Used	Format of data	Existing data collection policy	Frequency of data collection	Comments
						ways					
LV UGB	Reliability Modifier	Reliability Collar Input	Section 6.15	N/A	N/A	Not used for this asset category	N/A	N/A	N/A	N/A	
LV UGB	PoF	No of Units	Section 6.1	Yes	N/A	Always 1	N/A	Per LV UGB	N/A	N/A	
LV UGB	Safety CoF	Type Safety Rating	Appendix D.2.2.2, Table 218	Yes	EAM	Based on ESQC equipment risk	Inspection/maintenance record	Inspection Score	Ongoing routine inspection cycle	Captured during routine asset inspection/maintenance according to Inspection and Maintenance Frequency Schedule	
LV UGB	Safety CoF	Location Safety Rating	Appendix D.2.2.2, Table 218	Yes	EAM	Based on ESQC location risk	Inspection/maintenance record	Inspection Score	Ongoing routine inspection cycle	Captured during routine asset inspection/maintenance according to Inspection and Maintenance Frequency Schedule	
LV UGB	Network Performance CoF	Number of Connected Customers	Appendix D.4.2, Eq. 37	Yes	PowerOn	Based on number of connected MPANS and normal network running arrangement	Network connectivity	N/A	One off activity	Ad-hoc on-going network connectivity updates	

HI Asset Category	CNAIM Calculation Step	Data Required	CNAIM Document Reference	Data Collected	Data Source	Data used to provide CNAIM input	Data Type Used	Format of data	Existing data collection policy	Frequency of data collection	Comments
LV UGB	Network Performance CoF	Customer Sensitivity Factor	Appendix D.4.2	Yes, but not currently mapped to the model.	PowerOn	Based on Vulnerable Customer record, system association required to link assets between PowerOn and EAM	Network connectivity	Sensitive Flag	One off activity	Ad-hoc on-going network connectivity updates	CAT score will improve once mapping is developed.
LV UGB	Network Performance CoF	KVA Band Per Customer	Appendix D.4.2, Table 226	Yes, but not currently mapped to the model.	PowerOn	Based on Maximum Demand, System association required to link assets between PowerOn and EAM	Network connectivity	Value in kVA	One off activity	Ad-hoc on-going network connectivity updates	CAT score will improve once mapping is developed.

Table 8. OHL Support - Poles

HI Asset Category	CNAIM Calculation Step	Data Required	CNAIM Document Reference	Data Collected	Data Source	Data used to provide CNAIM input	Data Type Used	Format of data	Existing data collection policy	Frequency of data collection	Comments

HI Asset Category	CNAIM Calculation Step	Data Required	CNAIM Document Reference	Data Collected	Data Source	Data used to provide CNAIM input	Data Type Used	Format of data	Existing data collection policy	Frequency of data collection	Comments
LV OHL Support, HV OHL Support - Poles, EHV OHL Support - Poles	Location Factor	Distance From Coast	Appendix B.3.1, Table 22	Yes	EAM, Third Party Audits/reports	Calculated using Pythagorean theorem	Derived from Asset commissioning record	Value in Meters	One off activity	Derived using third party data and asset location data captured at asset commission	
LV OHL Support, HV OHL Support - Poles, EHV OHL Support - Poles	Location Factor	Altitude	Appendix B.3.1, Table 23	Yes	EAM, Third Party Audits/reports	To be mapped using external GIS data source	Derived from Asset commissioning record	Value in Meters	One off activity	Derived using third party data and asset location data captured at asset commission	

HI Asset Category	CNAIM Calculation Step	Data Required	CNAIM Document Reference	Data Collected	Data Source	Data used to provide CNAIM input	Data Type Used	Format of data	Existing data collection policy	Frequency of data collection	Comments
LV OHL Support, HV OHL Support - Poles, EHV OHL Support - Poles	Location Factor	Corrosion Category	Appendix B.3.1, Table 24	Yes	EAM, Third Party Audits/reports	Calculated using corrosion rating from external data source and GIS data	Derived from Asset commissioning record	Rating	One off activity	Derived using third party data and asset location data captured at asset commission	
LV OHL Support, HV OHL Support - Poles, EHV OHL Support - Poles	Location Factor	Indoor/Outdoor	Sections 6.4.5 & 6.4.6	Yes	N/A	Default to outdoor as there is no indoor poles in UKPN	N/A	Text	One off activity	N/A	

HI Asset Category	CNAIM Calculation Step	Data Required	CNAIM Document Reference	Data Collected	Data Source	Data used to provide CNAIM input	Data Type Used	Format of data	Existing data collection policy	Frequency of data collection	Comments
LV OHL Support, HV OHL Support - Poles, EHV OHL Support - Poles	Location Factor	Material (Poles)	Appendix B.3.1	Yes	EAM	Based on pole construction material	Asset commissioning record	Text	One off activity	Captured at asset commission	
LV OHL Support, HV OHL Support - Poles, EHV OHL Support - Poles	Initial Health Score	Expected Life Sub-division	Appendix B.1	Yes	EAM	Based on the asset's material type	Inspection/maintenance record	Text	One off activity	Captured at asset commission	

HI Asset Category	CNAIM Calculation Step	Data Required	CNAIM Document Reference	Data Collected	Data Source	Data used to provide CNAIM input	Data Type Used	Format of data	Existing data collection policy	Frequency of data collection	Comments
LV OHL Support, HV OHL Support - Poles, EHV OHL Support - Poles	Initial Health Score	Age	Section 6.1.6, Eq. 4	Yes	EAM	Based on Year of Manufacture, Commission Year	Asset commissioning record	Date	One off activity	Captured at asset commission or relocation	
LV OHL Support, HV OHL Support - Poles, EHV OHL Support - Poles	Observed Condition Modifier	Visual Pole Condition	Appendix B.5.16, Table 95, Appendix B.5.17, Table 99, Appendix B.5.18, Table 103	Yes	EAM	Based on asset's material type, exterior, steel condition	Inspection/maintenance record	Inspection Score	Ongoing routine inspection cycle	Captured during routine asset inspection/maintenance according to Inspection and Maintenance Frequency Schedule	

HI Asset Category	CNAIM Calculation Step	Data Required	CNAIM Document Reference	Data Collected	Data Source	Data used to provide CNAIM input	Data Type Used	Format of data	Existing data collection policy	Frequency of data collection	Comments
LV OHL Support, HV OHL Support - Poles, EHV OHL Support - Poles	Observed Condition Modifier	Visual Pole Condition: Pole Top Rot	Appendix B.5.16, Table 96, Appendix B.5.17, Table 100, Appendix B.5.18, Table 104	Yes	EAM	Based on asset's material with pole top rot condition	Inspection/maintenance record	Inspection Score	Ongoing routine inspection cycle	Captured during routine asset inspection/maintenance according to Inspection and Maintenance Frequency Schedule	
LV OHL Support, HV OHL Support - Poles, EHV OHL Support - Poles	Observed Condition Modifier	Pole Leaning	Appendix B.5.16, Table 97, Appendix B.5.17, Table 101, Appendix B.5.18, Table 105	Yes	EAM	Based on asset with pole leaning defect	Inspection/maintenance record	Inspection Score	Ongoing routine inspection cycle	Captured during routine asset inspection/maintenance according to Inspection and Maintenance Frequency Schedule	

HI Asset Category	CNAIM Calculation Step	Data Required	CNAIM Document Reference	Data Collected	Data Source	Data used to provide CNAIM input	Data Type Used	Format of data	Existing data collection policy	Frequency of data collection	Comments
LV OHL Support, HV OHL Support - Poles, EHV OHL Support - Poles	Observed Condition Modifier	Bird / Animal Damage	Appendix B.5.16, Table 98, Appendix B.5.17, Table 102, Appendix B.5.18, Table 106	Yes	EAM	Based on asset's material with wood pecker hole condition	Inspection/maintenance record	Inspection Score	Ongoing routine inspection cycle	Captured during routine asset inspection/maintenance according to Inspection and Maintenance Frequency Schedule	
LV OHL Support, HV OHL Support - Poles, EHV OHL Support - Poles	Measured Condition Modifier	Pole Decay / Deterioration	Appendix B.6.22, Table 185, Appendix B.6.23, Table 186, Appendix B.6.24, Table 187	Yes	EAM	Based on asset's height, diameter, plant loading and pole rot condition	Inspection/maintenance record	Inspection Score	Ongoing routine inspection cycle	Captured during routine asset inspection/maintenance according to Inspection and Maintenance Frequency Schedule	

HI Asset Category	CNAIM Calculation Step	Data Required	CNAIM Document Reference	Data Collected	Data Source	Data used to provide CNAIM input	Data Type Used	Format of data	Existing data collection policy	Frequency of data collection	Comments
LV OHL Support, HV OHL Support - Poles, EHV OHL Support - Poles	Reliability Modifier	Reliability Factor Input	Section 6.14	N/A	N/A	Not used for this asset category	N/A	N/A	N/A	N/A	
LV OHL Support, HV OHL Support - Poles, EHV OHL Support - Poles	Reliability Modifier	Reliability Collar Input	Section 6.15	N/A	N/A	Not used for this asset category	N/A	N/A	N/A	N/A	

HI Asset Category	CNAIM Calculation Step	Data Required	CNAIM Document Reference	Data Collected	Data Source	Data used to provide CNAIM input	Data Type Used	Format of data	Existing data collection policy	Frequency of data collection	Comments
LV OHL Support, HV OHL Support - Poles, EHV OHL Support - Poles	PoF	No Of Units	Section 6.1	Yes	N/A	Always set to 1	N/A	Per Pole	N/A	N/A	
LV OHL Support, HV OHL Support - Poles, EHV OHL Support - Poles	Safety CoF	Type Safety Rating	Appendix D.2.2.2, Table 218	Yes	EAM	Based on ESQC equipment risk and risk rating	Inspection/maintenance record	Inspection Score	Ongoing routine inspection cycle	Captured during routine asset inspection/maintenance according to Inspection and Maintenance Frequency Schedule	

HI Asset Category	CNAIM Calculation Step	Data Required	CNAIM Document Reference	Data Collected	Data Source	Data used to provide CNAIM input	Data Type Used	Format of data	Existing data collection policy	Frequency of data collection	Comments
LV OHL Support, HV OHL Support - Poles, EHV OHL Support - Poles	Safety CoF	Location Safety Rating	Appendix D.2.2.2, Table 218	Yes	EAM	Based on ESQC location risk	Inspection/maintenance record	Inspection Score	Ongoing routine inspection cycle	Captured during routine asset inspection/maintenance according to Inspection and Maintenance Frequency Schedule	
LV OHL Support, HV OHL Support - Poles	Network Performance CoF	Number of Connected Customers	Appendix D.4.2, Eq. 37	Yes	PowerOn	Based on number of connected MPANS and normal network running arrangement	Network connectivity	N/A	One off activity	Ad-hoc on-going network connectivity updates	
LV OHL Support, HV OHL Support - Poles	Network Performance CoF	Customer Sensitivity Factor	Appendix D.4.2	Yes, but not currently mapped to the model.	PowerOn	Based on Vulnerable Customer record, system association required to link	Network connectivity	Sensitivity Flag	One off activity	Ad-hoc on-going network connectivity updates	CAT score will improve once mapping is developed.

HI Asset Category	CNAIM Calculation Step	Data Required	CNAIM Document Reference	Data Collected	Data Source	Data used to provide CNAIM input	Data Type Used	Format of data	Existing data collection policy	Frequency of data collection	Comments
						assets between PowerOn and EAM					
LV OHL Support, HV OHL Support - Poles	Network Performance CoF	KVA Band Per Customer	Appendix D.4.2, Table 226	Yes, but not currently mapped to the model.	PowerOn	Based on Maximum Demand, System association required to link assets between PowerOn and EAM	Network connectivity	N/A	Real time data	Ad-hoc on-going network connectivity updates	CAT score will improve once mapping is developed.
LV OHL Support, HV OHL Support - Poles, EHV OHL Support - Poles	Financial CoF	Type Financial Rating	Appendix D.1.2.1, Table 212	Yes	EAM	Based on asset hierarchy, plant loading on pole.	Asset commissioning record	N/A	One off activity	Captured at asset commission	

HI Asset Category	CNAIM Calculation Step	Data Required	CNAIM Document Reference	Data Collected	Data Source	Data used to provide CNAIM input	Data Type Used	Format of data	Existing data collection policy	Frequency of data collection	Comments
LV OHL Support, HV OHL Support - Poles, EHV OHL Support - Poles	Financial CoF	Access Financial Rating	Appendix D.1.2.2, Table 213	Yes	EAM	Based on ESQC span location risk	Inspection/maintenance record	Inspection Score	Ongoing routine inspection cycle	Captured during routine asset inspection/maintenance according to Inspection and Maintenance Frequency Schedule	
EHV OHL Support - Poles	Network Performance CoF	Maximum Demand	Section 7.6.3.2, Eq. 40	Yes	PowerOn	Based on Maximum Demand, System association required to link assets between PowerOn and EAM	Network connectivity	Value in KVA	One off activity	Ad-hoc on-going network connectivity updates	
EHV OHL Support - Poles	Network Performance CoF	Network Type	Section 7.6.3.2	Yes	PowerOn	Always "Secure" since P2/6 compliant	N/A	N/A	One off activity	N/A	

Table 9. OHL Support - Towers

HI Asset Category	CNAIM Calculation Step	Data Required	CNAIM Document Reference	Data Collected	Data Source	Data used to provide CNAIM input	Data Type Used	Format of data	Existing data collection policy	Frequency of data collection	Comments
EHV OHL Support - Towers, 132kV OHL Support - Tower	Location Factor	Distance From Coast	Appendix B.3.1, Table 22	Yes	EAM, Third Party Audits/reports	Calculated using Pythagorean theorem	Derived from Asset commissioning record	Value in meters	One off activity	Derived using third party data and asset location data captured at asset commission	
EHV OHL Support - Towers, 132kV OHL Support - Tower	Location Factor	Altitude	Appendix B.3.1, Table 23	Yes	EAM, Third Party Audits/reports	To be mapped using external data source	Derived from Asset commissioning record	Value in meters	One off activity	Derived using third party data and asset location data captured at asset commission	
EHV OHL Support - Towers, 132kV OHL Support - Tower	Location Factor	Corrosion Category	Appendix B.3.1, Table 24	Yes	EAM, Third Party Audits/reports	Calculated using corrosion rating from external data source and GIS data	Derived from Asset commissioning record	Rating	One off activity	Derived using third party data and asset location data captured at asset commission	

HI Asset Category	CNAIM Calculation Step	Data Required	CNAIM Document Reference	Data Collected	Data Source	Data used to provide CNAIM input	Data Type Used	Format of data	Existing data collection policy	Frequency of data collection	Comments
EHV OHL Support - Towers, 132kV OHL Support - Tower	Location Factor	Indoor/Outdoor	Sections 6.4.5 & 6.4.6	Yes	N/A	Default to outdoor as there is no indoor tower in UKPN	N/A	Text	One off activity	N/A	
EHV OHL Support - Towers, 132kV OHL Support - Tower	Initial Health Score	Tower - Expected Life Sub-division	Appendix B.1	Yes	N/A	Always "Steelwork"	N/A	Text	One off activity	N/A	
EHV OHL Support - Towers, 132kV OHL Support - Tower	Initial Health Score	Tower - Age	Section 6.1.6, Eq. 4	Yes	EAM	Based on Year of Manufacture, Commission Year	Asset commissioning record	Date	One off activity	Captured at asset commission or relocation	

HI Asset Category	CNAIM Calculation Step	Data Required	CNAIM Document Reference	Data Collected	Data Source	Data used to provide CNAIM input	Data Type Used	Format of data	Existing data collection policy	Frequency of data collection	Comments
EHV OHL Support - Towers, 132kV OHL Support - Tower	Initial Health Score	Paintwork - Expected Life Sub-division	Appendix B.1	Yes	EAM	Based on Year of Manufacture, Commission Year	Asset commissioning record	Date	One off activity	Captured at asset commission	
EHV OHL Support - Towers, 132kV OHL Support - Tower	Initial Health Score	Paintwork - Age	Section 6.1.6, Eq. 4	Yes	EAM	Based on tower painting date	Inspection/maintenance record	Date	One off activity	Captured during routine asset inspection/maintenance according to Inspection and Maintenance Frequency Schedule	
EHV OHL Support - Towers, 132kV OHL Support - Tower	Initial Health Score	Foundation - Expected Life Sub-division	Appendix B.1	Yes	EAM	Based on foundation type	Asset commissioning record	Text	One off activity	Captured at asset commission	

HI Asset Category	CNAIM Calculation Step	Data Required	CNAIM Document Reference	Data Collected	Data Source	Data used to provide CNAIM input	Data Type Used	Format of data	Existing data collection policy	Frequency of data collection	Comments
EHV OHL Support - Towers, 132kV OHL Support - Tower	Initial Health Score	Foundation - Age	Section 6.1.6, Eq. 4	Yes	EAM	Based on Year of Manufacture, Commission Year	Asset commissioning record	Date	One off activity	Captured at asset commission	
EHV OHL Support - Towers, 132kV OHL Support - Tower	Observed Condition Modifier	Tower Legs	Appendix B.5.19, Table 107, Appendix B.5.22, Table 113	Yes	EAM	Based on steel condition	Inspection/maintenance record	Inspection Score	Ongoing routine inspection cycle	Captured during routine asset inspection/maintenance according to Inspection and Maintenance Frequency Schedule	
EHV OHL Support - Towers, 132kV OHL Support - Tower	Observed Condition Modifier	Bracings	Appendix B.5.19, Table 108, Appendix B.5.22, Table 114	Yes	EAM	Based on steel condition	Inspection/maintenance record	Inspection Score	Ongoing routine inspection cycle	Captured during routine asset inspection/maintenance according to Inspection and Maintenance Frequency Schedule	

HI Asset Category	CNAIM Calculation Step	Data Required	CNAIM Document Reference	Data Collected	Data Source	Data used to provide CNAIM input	Data Type Used	Format of data	Existing data collection policy	Frequency of data collection	Comments
EHV OHL Support - Towers, 132kV OHL Support - Tower	Observed Condition Modifier	Crossarms	Appendix B.5.19, Table 109, Appendix B.5.22, Table 115	Yes	EAM	Based on condition of steelwork	Inspection/maintenance record	Inspection Score	Ongoing routine inspection cycle	Captured during routine asset inspection/maintenance according to Inspection and Maintenance Frequency Schedule	
EHV OHL Support - Towers, 132kV OHL Support - Tower	Observed Condition Modifier	Peak	Appendix B.5.19, Table 110, Appendix B.5.22, Table 116	Yes	EAM	Based on steel condition	Inspection/maintenance record	Inspection Score	Ongoing routine inspection cycle	Captured during routine asset inspection/maintenance according to Inspection and Maintenance Frequency Schedule	
EHV OHL Support - Towers, 132kV OHL Support - Tower	Observed Condition Modifier	Paintwork Condition	Appendix B.5.20, Table 111, Appendix B.5.23, Table 117	Yes	EAM	Based on condtion of paintwork	Inspection/maintenance record	Inspection Score	Ongoing routine inspection cycle	Captured during routine asset inspection/maintenance according to Inspection and Maintenance Frequency Schedule	

HI Asset Category	CNAIM Calculation Step	Data Required	CNAIM Document Reference	Data Collected	Data Source	Data used to provide CNAIM input	Data Type Used	Format of data	Existing data collection policy	Frequency of data collection	Comments
EHV OHL Support - Towers, 132kV OHL Support - Tower	Observed Condition Modifier	Foundation Condition	Appendix B.5.21, Table 112, Appendix B.5.24, Table 118	Yes	EAM	Based on defective muff and corrosion of tower footing	Inspection/maintenance record	Inspection Score	Ongoing routine inspection cycle	Captured during routine asset inspection/maintenance according to Inspection and Maintenance Frequency Schedule	
EHV OHL Support - Towers, 132kV OHL Support - Tower	Reliability Modifier	Reliability Factor Input	Section 6.14	N/A	N/A	Not used for this asset category	N/A	N/A	N/A	N/A	
EHV OHL Support - Towers, 132kV OHL Support - Tower	Reliability Modifier	Reliability Collar Input	Section 6.15	N/A	N/A	Not used for this asset category	N/A	N/A	N/A	N/A	

HI Asset Category	CNAIM Calculation Step	Data Required	CNAIM Document Reference	Data Collected	Data Source	Data used to provide CNAIM input	Data Type Used	Format of data	Existing data collection policy	Frequency of data collection	Comments
EHV OHL Support - Towers, 132kV OHL Support - Tower	PoF	No Of Units	Section 6.1	Yes	N/A	Always 1	N/A	Per Tower	N/A	N/A	
EHV OHL Support - Towers, 132kV OHL Support - Tower	Safety CoF	Type Safety Rating	Appendix D.2.2.2, Table 218	Yes	EAM	Based on ESQC equipment risk and risk rating	Inspection/maintenance record	Inspection Score	Ongoing routine inspection cycle	Captured during routine asset inspection/maintenance according to Inspection and Maintenance Frequency Schedule	
EHV OHL Support - Towers, 132kV OHL Support - Tower	Safety CoF	Location Safety Rating	Appendix D.2.2.2, Table 218	Yes	EAM	Based on ESQC location risk	Inspection/maintenance record	Inspection Score	Ongoing routine inspection cycle	Captured during routine asset inspection/maintenance according to Inspection and Maintenance Frequency Schedule	

HI Asset Category	CNAIM Calculation Step	Data Required	CNAIM Document Reference	Data Collected	Data Source	Data used to provide CNAIM input	Data Type Used	Format of data	Existing data collection policy	Frequency of data collection	Comments
EHV OHL Support - Towers, 132kV OHL Support - Tower	Network Performance CoF	Maximum Demand	Section 7.6.3.2, Eq. 40	Yes	PowerOn	Based on Maximum Demand, System association required to link assets between PowerOn and EAM	Network connectivity	Value in kVA	One off activity	Ad-hoc on-going network connectivity updates	
EHV OHL Support - Towers, 132kV OHL Support - Tower	Network Performance CoF	Network Type	Section 7.6.3.2	Yes	PowerOn	Always secure since P2/6 compliant	N/A	N/A	One off activity	N/A	
EHV OHL Support - Towers, 132kV OHL Support - Tower	Financial CoF	Type Financial Rating	Appendix D.1.2.1, Table 212	Yes	EAM	Based on tower configuration	Asset commissioning record	Text	One off activity	Captured at asset commission	

HI Asset Category	CNAIM Calculation Step	Data Required	CNAIM Document Reference	Data Collected	Data Source	Data used to provide CNAIM input	Data Type Used	Format of data	Existing data collection policy	Frequency of data collection	Comments
EHV OHL Support - Towers, 132kV OHL Support - Tower	Financial CoF	Access Financial Rating	Appendix D.1.2.2, Table 213	Yes	EAM	Based on ESQC span risk code	Asset commissioning record	Inspection Score	Ongoing routine inspection cycle	Captured during routine asset inspection/maintenance according to Inspection and Maintenance Frequency Schedule	

Table 10. OHL Conductor (Tower Lines)

HI Asset Category	CNAIM Calculation Step	Data Required	CNAIM Document Reference	Data Collected	Data Source	Data used to provide CNAIM input	Data Type Used	Format of data	Existing data collection policy	Frequency of data collection	Comments
EHV OHL Conductor (Tower Lines), 132kV OHL Conductor (Tower Lines)	Location Factor	Distance From Coast	Appendix B.3.1, Table 22	Yes	EAM, Third Party Audits/reports	Calculated using Pythagorean theorem	Derived from Asset commissioning record	Value in meters	One off activity	Derived using third party data and asset location data captured at asset commission	

HI Asset Category	CNAIM Calculation Step	Data Required	CNAIM Document Reference	Data Collected	Data Source	Data used to provide CNAIM input	Data Type Used	Format of data	Existing data collection policy	Frequency of data collection	Comments
EHV OHL Conductor (Tower Lines), 132kV OHL Conductor (Tower Lines)	Location Factor	Altitude	Appendix B.3.1, Table 23	Yes	EAM, Third Party Audits/reports	To be mapped using external data source	Derived from Asset commissioning record	Value in meters	One off activity	Derived using third party data and asset location data captured at asset commission	
EHV OHL Conductor (Tower Lines), 132kV OHL Conductor (Tower Lines)	Location Factor	Corrosion Category	Appendix B.3.1, Table 24	Yes	EAM, Third Party Audits/reports	Calculated using corrosion rating from external data source and GIS data	Derived from Asset commissioning record	Rating	One off activity	Derived using third party data and asset location data captured at asset commission	
EHV OHL Conductor (Tower Lines), 132kV	Location Factor	Indoor/Outdoor	Sections 6.4.5 & 6.4.6	Yes	N/A	Default to outdoor as there is no indoor tower in UKPN	N/A	N/A	Text	N/A	

HI Asset Category	CNAIM Calculation Step	Data Required	CNAIM Document Reference	Data Collected	Data Source	Data used to provide CNAIM input	Data Type Used	Format of data	Existing data collection policy	Frequency of data collection	Comments
OHL Conductor (Tower Lines)											
EHV OHL Conductor (Tower Lines), 132kV OHL Conductor (Tower Lines)	Initial Health Score	Expected Life Sub-division	Appendix B.1	Yes	EAM	Based on conductor type	Asset commissioning record	Text	Text	Captured at asset commission	
EHV OHL Conductor (Tower Lines), 132kV OHL Conductor (Tower Lines)	Initial Health Score	Age	Section 6.1.6, Eq. 4	Yes	EAM	Based on circuit commissioning date and restrining date	Asset commissioning record	Date	Date	Captured at asset commission or restringing	

HI Asset Category	CNAIM Calculation Step	Data Required	CNAIM Document Reference	Data Collected	Data Source	Data used to provide CNAIM input	Data Type Used	Format of data	Existing data collection policy	Frequency of data collection	Comments
EHV OHL Conductor (Tower Lines), 132kV OHL Conductor (Tower Lines)	Observed Condition Modifier	Visual Condition	Appendix B.5.27, Table 127, Appendix B.5.28, Table 129	Yes	EAM	Based on conductor integrity and condition	Inspection/maintenance record	Inspection Score	Ongoing routine inspection cycle	Captured during routine asset inspection/maintenance according to Inspection and Maintenance Frequency Schedule	
EHV OHL Conductor (Tower Lines), 132kV OHL Conductor (Tower Lines)	Observed Condition Modifier	Midspan Joints	Appendix B.5.27, Table 128, Appendix B.5.28, Table 130	Not Currently Collected	N/A	UK Power Networks currently do not collect midspan joint information	N/A	N/A	N/A	N/A	
EHV OHL Conductor (Tower Lines), 132kV	Measured Condition Modifier	Conductor Sampling	Appendix B.6.27, Table 192, Appendix	Not Currently Collected	N/A	Conductor sampling is used in UK Power Networks	N/A	N/A	N/A	N/A	

HI Asset Category	CNAIM Calculation Step	Data Required	CNAIM Document Reference	Data Collected	Data Source	Data used to provide CNAIM input	Data Type Used	Format of data	Existing data collection policy	Frequency of data collection	Comments
OHL Conductor (Tower Lines)			B.6.28, Table 194								
EHV OHL Conductor (Tower Lines), 132kV OHL Conductor (Tower Lines)	Measured Condition Modifier	Corrosion Monitoring Survey	Appendix B.6.27, Table 193, Appendix B.6.28, Table 195	Yes	EAM	Based on conductor cormon condition	Inspection/maintenance record	Inspection Score	Ongoing routine inspection cycle	Captured during routine asset inspection/maintenance according to Inspection and Maintenance Frequency Schedule	
EHV OHL Conductor (Tower Lines), 132kV OHL Conductor (Tower Lines)	Reliability Modifier	Reliability Factor Input	Section 6.14	N/A	N/A	Not used for this asset category	N/A	N/A	N/A	N/A	

HI Asset Category	CNAIM Calculation Step	Data Required	CNAIM Document Reference	Data Collected	Data Source	Data used to provide CNAIM input	Data Type Used	Format of data	Existing data collection policy	Frequency of data collection	Comments
EHV OHL Conductor (Tower Lines), 132kV OHL Conductor (Tower Lines)	Reliability Modifier	Reliability Collar Input	Section 6.14	N/A	N/A	Not used for this asset category	N/A	N/A	N/A	N/A	
EHV OHL Conductor (Tower Lines), 132kV OHL Conductor (Tower Lines)	PoF	No Of Units	Section 6.1	Yes	EAM, NetMap	Based on span length	Asset commissioning record	Value in kilometers	One off activity	Captured at asset commission	
EHV OHL Conductor (Tower Lines), 132kV	Safety CoF	Type Safety Rating	Appendix D.2.2.2, Table 218	Yes	EAM	Based on ESQC span risk rating	Inspection/maintenance record	Inspection Score	Ongoing routine inspection cycle	Captured during routine asset inspection/maintenance according to Inspection and Maintenance Frequency	

HI Asset Category	CNAIM Calculation Step	Data Required	CNAIM Document Reference	Data Collected	Data Source	Data used to provide CNAIM input	Data Type Used	Format of data	Existing data collection policy	Frequency of data collection	Comments
OHL Conductor (Tower Lines)										Schedule	
EHV OHL Conductor (Tower Lines), 132kV OHL Conductor (Tower Lines)	Safety CoF	Location Safety Rating	Appendix D.2.2.2, Table 218	Yes	EAM	Based on ESQC span location risk	Inspection/maintenance record	Inspection Score	Ongoing routine inspection cycle	Captured during routine asset inspection/maintenance according to Inspection and Maintenance Frequency Schedule	
EHV OHL Conductor (Tower Lines), 132kV OHL Conductor (Tower Lines)	Network Performance CoF	Maximum Demand	Section 7.6.3.2, Eq. 40	Yes	PowerOn	Based on Maximum Demand, System association required to link assets between PowerOn and EAM	Network connectivity	Value in kVA	One off activity	Ad-hoc on-going network connectivity updates	

HI Asset Category	CNAIM Calculation Step	Data Required	CNAIM Document Reference	Data Collected	Data Source	Data used to provide CNAIM input	Data Type Used	Format of data	Existing data collection policy	Frequency of data collection	Comments
EHV OHL Conductor (Tower Lines), 132kV OHL Conductor (Tower Lines)	Network Performance CoF	Network Type	Section 7.6.3.2	Yes	PowerOn	Always secure since P2/6 compliant	N/A	N/A	One off activity	N/A	
EHV OHL Conductor (Tower Lines), 132kV OHL Conductor (Tower Lines)	Financial CoF	Access Financial Rating	Appendix D.1.2.2, Table 213	Yes	EAM	Based on ESQC span risk code	Inspection/maintenance record	Inspection Score	Ongoing routine inspection cycle	Captured during routine asset inspection/maintenance according to Inspection and Maintenance Frequency Schedule	

Table 11. OHL Fittings

HI Asset Category	CNAIM Calculation Step	Data Required	CNAIM Document Reference	Data Collected	Data Source	Data used to provide CNAIM input	Data Type Used	Format of data	Existing data collection policy	Frequency of data collection	Comments
EHV OHL Fittings, 132kV OHL Fittings	Location Factor	Distance From Coast	Appendix B.3.1, Table 22	Yes	EAM, Third Party Audits/reports	Calculated using Pythagorean theorem	Derived from Asset commissioning record	Value in meters	One off activity	Derived using third party data and asset location data captured at asset commission	
EHV OHL Fittings, 132kV OHL Fittings	Location Factor	Altitude	Appendix B.3.1, Table 23	Yes	EAM, Third Party Audits/reports	To be mapped using external data source	Derived from Asset commissioning record	Value in meters	One off activity	Derived using third party data and asset location data captured at asset commission	
EHV OHL Fittings, 132kV OHL Fittings	Location Factor	Corrosion Category	Appendix B.3.1, Table 24	Yes	EAM, Third Party Audits/reports	Calculated using corrosion rating from external data source and GIS data	Derived from Asset commissioning record	Rating	One off activity	Derived using third party data and asset location data captured at asset commission	
EHV OHL Fittings, 132kV OHL Fittings	Location Factor	Indoor/Outdoor	Sections 6.4.5 & 6.4.6	Yes	N/A	Default to outdoor as there is no indoor tower in UKPN	N/A	Text	One off activity	N/A	
EHV OHL Fittings, 132kV	Initial Health Score	Age	Section 6.1.6, Eq. 4	Yes	EAM	Based on fitting, insulator, circuit and	Asset commissioning record	Date	One off activity	Captured at asset commission or restringing	

HI Asset Category	CNAIM Calculation Step	Data Required	CNAIM Document Reference	Data Collected	Data Source	Data used to provide CNAIM input	Data Type Used	Format of data	Existing data collection policy	Frequency of data collection	Comments
OHL Fittings						tower commissioning dates					
EHV OHL Fittings, 132kV OHL Fittings	Observed Condition Modifier	Tower Fittings Condition	Appendix B.5.25, Table 119, Appendix B.5.26, Table 123	Yes	EAM	Based on tower fitting wear	Inspection/maintenance record	Inspection Score	Ongoing routine inspection cycle	Captured during routine asset inspection/maintenance according to Inspection and Maintenance Frequency Schedule	
EHV OHL Fittings, 132kV OHL Fittings	Observed Condition Modifier	Conductor Fittings Condition	Appendix B.5.25, Table 120, Appendix B.5.26, Table 124	Yes	EAM	Based on overall condition of fittings	Inspection/maintenance record	Inspection Score	Ongoing routine inspection cycle	Captured during routine asset inspection/maintenance according to Inspection and Maintenance Frequency Schedule	
EHV OHL Fittings, 132kV OHL Fittings	Observed Condition Modifier	Insulators - Electrical Condition	Appendix B.5.25, Table 121, Appendix	Yes	EAM	Based on insulator corrosion and flashover	Inspection/maintenance record	Inspection Score	Ongoing routine inspection cycle	Captured during routine asset inspection/maintenance according to Inspection and Maintenance Frequency	

HI Asset Category	CNAIM Calculation Step	Data Required	CNAIM Document Reference	Data Collected	Data Source	Data used to provide CNAIM input	Data Type Used	Format of data	Existing data collection policy	Frequency of data collection	Comments
			B.5.26, Table 125							Schedule	
EHV OHL Fittings, 132kV OHL Fittings	Observed Condition Modifier	Insulators - Mechanical Condition	Appendix B.5.25, Table 122, Appendix B.5.26, Table 126	Yes	EAM	Based on cracked, shattered, flashed over insulator records	Inspection/maintenance record	Inspection Score	Ongoing routine inspection cycle	Captured during routine asset inspection/maintenance according to Inspection and Maintenance Frequency Schedule	
EHV OHL Fittings, 132kV OHL Fittings	Measured Condition Modifier	Thermal Imaging	Appendix B.6.25, Table 188, Appendix B.6.26, Table 190	Yes	Third Party Audits/reports	Based on helicopter inspection records, data association required to link to EAM assets	Inspection/maintenance record	Inspection Score	Ongoing routine inspection cycle	Captured during helicopter patrol according to Inspection and Maintenance Frequency Schedule	

HI Asset Category	CNAIM Calculation Step	Data Required	CNAIM Document Reference	Data Collected	Data Source	Data used to provide CNAIM input	Data Type Used	Format of data	Existing data collection policy	Frequency of data collection	Comments
EHV OHL Fittings, 132kV OHL Fittings	Measured Condition Modifier	Ductor Test	Appendix B.6.25, Table 189, Appendix B.6.26, Table 191	Not Currently Collected	N/A	UK Power Networks currently do not perform ductor testing on tower fittings	N/A	N/A	Not Currently Collected	N/A	
EHV OHL Fittings, 132kV OHL Fittings	Reliability Modifier	Reliability Factor Input	Section 6.14	N/A	N/A	Not used for this asset category	N/A	N/A	N/A	N/A	
EHV OHL Fittings, 132kV OHL Fittings	Reliability Modifier	Reliability Collar Input	Section 6.14	N/A	N/A	Not used for this asset category	N/A	N/A	N/A	N/A	
EHV OHL Fittings, 132kV OHL Fittings	PoF	No Of Units	Section 6.1	Yes	EAM	Based on number of circuits per tower	Asset commissioning record	Set per circuit	One off activity	Captured at asset commission	

HI Asset Category	CNAIM Calculation Step	Data Required	CNAIM Document Reference	Data Collected	Data Source	Data used to provide CNAIM input	Data Type Used	Format of data	Existing data collection policy	Frequency of data collection	Comments
EHV OHL Fittings, 132kV OHL Fittings	Safety CoF	Type Safety Rating	Appendix D.2.2.2, Table 218	Yes	EAM	Based on ESQC equipment risk rating	Inspection/maintenance record	Inspection Score	Ongoing routine inspection cycle	Captured during routine asset inspection/maintenance according to Inspection and Maintenance Frequency Schedule	
EHV OHL Fittings, 132kV OHL Fittings	Safety CoF	Location Safety Rating	Appendix D.2.2.2, Table 218	Yes	EAM	Based on ESQC location risk	Inspection/maintenance record	Inspection Score	Ongoing routine inspection cycle	Captured during routine asset inspection/maintenance according to Inspection and Maintenance Frequency Schedule	
EHV OHL Fittings, 132kV OHL Fittings	Network Performance CoF	Maximum Demand	Section 7.6.3.2, Eq. 40	Yes	PowerOn	Based on Maximum Demand, System association required to link assets between PowerOn and EAM	Network connectivity	Value in kVA	One off activity	Ad-hoc on-going network connectivity updates	
EHV OHL Fittings, 132kV OHL	Network Performance CoF	Network Type	Section 7.6.3.2	Yes	PowerOn	Always secure since P2/6 compliant	N/A	N/A	One off activity	N/A	

HI Asset Category	CNAIM Calculation Step	Data Required	CNAIM Document Reference	Data Collected	Data Source	Data used to provide CNAIM input	Data Type Used	Format of data	Existing data collection policy	Frequency of data collection	Comments
Fittings											
EHV OHL Fittings, 132kV OHL Fittings	Financial CoF	Access Financial Rating	Appendix D.1.2.2, Table 213	Yes	EAM	Based on ESQC span risk code	Inspection/maintenance record	Inspection Score	Ongoing routine inspection cycle	Captured during routine asset inspection/maintenance according to Inspection and Maintenance Frequency Schedule	
EHV OHL Fittings, 132kV OHL Fittings	Financial CoF	Type Financial Rating	Appendix D.1.2.1, Table 212	Yes	EAM	Based on tower configuration	Asset commissioning record	Text	One off activity	Captured at asset commission	

Table 12. LV Switchgear and Other

HI Asset Category	CNAIM Calculation Step	Data Required	CNAIM Document Reference	Data Collected	Data Source	Data used to provide CNAIM input	Data Type Used	Format of data	Existing data collection policy	Frequency of data collection	Comments
LV Switchgear and Other	Location Factor	Distance From Coast	Appendix B.3.1, Table 22	Yes	EAM, Third Party Audits/reports	Calculated using Pythagorean theorem	Derived from Asset commissioning record	Value in meters	One off activity	Derived using third party data and asset location data captured at asset commission	

HI Asset Category	CNAIM Calculation Step	Data Required	CNAIM Document Reference	Data Collected	Data Source	Data used to provide CNAIM input	Data Type Used	Format of data	Existing data collection policy	Frequency of data collection	Comments
LV Switchgear and Other	Location Factor	Altitude	Appendix B.3.1, Table 23	Yes	EAM, Third Party Audits/reports	To be mapped using external data source	Derived from Asset commissioning record	Value in meters	One off activity	Derived using third party data and asset location data captured at asset commission	
LV Switchgear and Other	Location Factor	Corrosion Category	Appendix B.3.1, Table 24	Yes	EAM, Third Party Audits/reports	Calculated using corrosion rating from external data source and GIS data	Derived from Asset commissioning record	Rating	One off activity	Derived using third party data and asset location data captured at asset commission	
LV Switchgear and Other	Location Factor	Indoor/Outdoor	Sections 6.4.5 & 6.4.6	Yes	EAM	Based on asset situation	Asset commissioning record	Text	One off activity	Captured at asset commission or relocation	
LV Switchgear and Other	Initial Health Score	Age	Section 6.1.6, Eq. 4	Yes	EAM	Based on Year of Manufacture, Commission Year	Asset commissioning record	Date	One off activity	Captured at asset commission or relocation	
LV Switchgear and Other	Observed Condition Modifier	LV Pillar - Switchgear External Condition	Appendix B.5.5, Table 44	Yes	EAM	Based on external condition observed	Inspection/maintenance record	Inspection Score	Ongoing routine inspection	Captured during routine asset inspection/maintenance according to Inspection and	

HI Asset Category	CNAIM Calculation Step	Data Required	CNAIM Document Reference	Data Collected	Data Source	Data used to provide CNAIM input	Data Type Used	Format of data	Existing data collection policy	Frequency of data collection	Comments
									cycle	Maintenance Frequency Schedule	
LV Switchgear and Other	Observed Condition Modifier	LV Pillar - Compound Leaks	Appendix B.5.5, Table 45	Yes	EAM	Based on recorded leakage defects	Inspection/maintenance record	Inspection Score	Ongoing routine inspection cycle	Captured during routine asset inspection/maintenance according to Inspection and Maintenance Frequency Schedule	
LV Switchgear and Other	Observed Condition Modifier	LV Pillar - Internal Condition & Operation	Appendix B.5.5, Table 46	Yes	EAM	Based on overall condition observed	Inspection/maintenance record	Inspection Score	Ongoing routine inspection cycle	Captured during routine asset inspection/maintenance according to Inspection and Maintenance Frequency Schedule	
LV Switchgear and Other	Observed Condition Modifier	LV Pillar - Insulation Condition	Appendix B.5.5, Table 47	Yes	EAM	Based on recorded defects in the compound	Inspection/maintenance record	Inspection Score	Ongoing routine inspection cycle	Captured during routine asset inspection/maintenance according to Inspection and Maintenance Frequency Schedule	

HI Asset Category	CNAIM Calculation Step	Data Required	CNAIM Document Reference	Data Collected	Data Source	Data used to provide CNAIM input	Data Type Used	Format of data	Existing data collection policy	Frequency of data collection	Comments
LV Switchgear and Other	Observed Condition Modifier	LV Pillar - Signs of Heating	Appendix B.5.5, Table 48	Not Currently Collected	EAM	Data improvement action required	Inspection/maintenance record	N/A	N/A	Captured during routine asset inspection/maintenance according to Inspection and Maintenance Frequency Schedule	
LV Switchgear and Other	Observed Condition Modifier	LV Pillar - Phase Barriers	Appendix B.5.5, Table 49	Yes	EAM	Based on phase barrier frequency data	Inspection/maintenance record	Inspection Score	Ongoing routine inspection cycle	Captured during routine asset inspection/maintenance according to Inspection and Maintenance Frequency Schedule	
LV Switchgear and Other	Observed Condition Modifier	LV Board - Switchgear External Condition	Appendix B.5.4, Table 41	Yes	EAM	Based on external condition observed	Inspection/maintenance record	Inspection Score	Ongoing routine inspection cycle	Captured during routine asset inspection/maintenance according to Inspection and Maintenance Frequency Schedule	
LV Switchgear and Other	Observed Condition Modifier	LV Board - Compound Leaks	Appendix B.5.4, Table 42	Yes	EAM	Based on recorded leakage defects	Inspection/maintenance record	Inspection Score	Ongoing routine inspection cycle	Captured during routine asset inspection/maintenance according to Inspection and Maintenance Frequency	

HI Asset Category	CNAIM Calculation Step	Data Required	CNAIM Document Reference	Data Collected	Data Source	Data used to provide CNAIM input	Data Type Used	Format of data	Existing data collection policy	Frequency of data collection	Comments
										Schedule	
LV Switchgear and Other	Observed Condition Modifier	LV Board - Internal Condition & Operation	Appendix B.5.4, Table 43	Yes	EAM	Based on overall condition observed	Inspection/maintenance record	Inspection Score	Ongoing routine inspection cycle	Captured during routine asset inspection/maintenance according to Inspection and Maintenance Frequency Schedule	
LV Switchgear and Other	Observed Condition Modifier	LV Circuit Breaker - External Condition	Appendix B.5.3, Table 40	Yes	EAM	Based on external condition observed	Inspection/maintenance record	Inspection Score	Ongoing routine inspection cycle	Captured during routine asset inspection/maintenance according to Inspection and Maintenance Frequency Schedule	
LV Switchgear and Other	Measured Condition Modifier	LV Circuit Breaker - Operational Adequacy	Appendix B.6.3, Table 132	Yes	EAM	Based on recorded defects in the compound, operating mechanism, and condition of the operating	Inspection/maintenance record	Inspection Score	Ongoing routine inspection cycle	Captured during routine asset inspection/maintenance according to Inspection and Maintenance Frequency Schedule	

HI Asset Category	CNAIM Calculation Step	Data Required	CNAIM Document Reference	Data Collected	Data Source	Data used to provide CNAIM input	Data Type Used	Format of data	Existing data collection policy	Frequency of data collection	Comments
						mechanism					
LV Switchgear and Other	Measured Condition Modifier	LV Board - Operational Adequacy	Appendix B.6.4, Table 133	Yes	EAM	Based on recorded defects in the compound, operating mechanism, and condition of the fuse carrier	Inspection/maintenance record	Inspection Score	Ongoing routine inspection cycle	Captured during routine asset inspection/maintenance according to Inspection and Maintenance Frequency Schedule	
LV Switchgear and Other	Measured Condition Modifier	LV Pillar - Operational Adequacy	Appendix B.6.5, Table 135	Yes	EAM	Based on recorded defects in the compound, corrosion, and condition of the fuse carrier	Inspection/maintenance record	Inspection Score	Ongoing routine inspection cycle	Captured during routine asset inspection/maintenance according to Inspection and Maintenance Frequency Schedule	

HI Asset Category	CNAIM Calculation Step	Data Required	CNAIM Document Reference	Data Collected	Data Source	Data used to provide CNAIM input	Data Type Used	Format of data	Existing data collection policy	Frequency of data collection	Comments
LV Switchgear and Other	Measured Condition Modifier	LV Board - Security	Appendix B.6.4, Table 134	Yes	EAM	Based on operational safety of LV board	Inspection/maintenance record	Inspection Score	Ongoing routine inspection cycle	Captured during routine asset inspection/maintenance according to Inspection and Maintenance Frequency Schedule	
LV Switchgear and Other	Reliability Modifier	Reliability Factor Input	Section 6.14	Yes	Engineering Knowledge/Reports and EAM	Based on switchgear material type and number of ways	Derived from Asset commissioning record	Text	One off activity	Derived using third party data and asset location data captured at asset commission	
LV Switchgear and Other	Reliability Modifier	Reliability Collar Input	Section 6.14	Yes	Engineering Knowledge/Reports and EAM	Based on switchgear material type and number of ways	Derived from Asset commissioning record	Text	One off activity	Derived using third party data and asset location data captured at asset commission	
LV Switchgear and Other	PoF	No Of Units	Section 6.1	Yes	N/A	Always set to 1	N/A	per LV Switchgear	One off activity	N/A	
LV Switchgear and Other	Safety CoF	Type Safety Rating	Appendix D.2.2.2, Table 218	Yes	EAM	Based on ESQC equipment risk	Inspection/maintenance record	Inspection Score	Ongoing routine inspection cycle	Captured during routine asset inspection/maintenance according to Inspection and Maintenance Frequency	

HI Asset Category	CNAIM Calculation Step	Data Required	CNAIM Document Reference	Data Collected	Data Source	Data used to provide CNAIM input	Data Type Used	Format of data	Existing data collection policy	Frequency of data collection	Comments
										Schedule	
LV Switchgear and Other	Safety CoF	Location Safety Rating	Appendix D.2.2.2, Table 218	Yes	EAM	Based on ESQC location risk	Inspection/maintenance record	Inspection Score	Ongoing routine inspection cycle	Captured during routine asset inspection/maintenance according to Inspection and Maintenance Frequency Schedule	
LV Switchgear and Other	Network Performance CoF	Number of Connected Customers	Appendix D.4.2, Eq. 37	Yes	PowerOn	Based on number of connected MPANS and normal network running arrangement	Network connectivity	N/A	One off activity	Ad-hoc on-going network connectivity updates	
LV Switchgear and Other	Network Performance CoF	Customer Sensitivity Factor	Appendix D.4.2	Yes, but not currently mapped to the model.	PowerOn	Based on Vulnerable Customer record, system association required to link	Network connectivity	Sensitivity Flag	One off activity	Ad-hoc on-going network connectivity updates	CAT score will improve once mapping is developed.

HI Asset Category	CNAIM Calculation Step	Data Required	CNAIM Document Reference	Data Collected	Data Source	Data used to provide CNAIM input	Data Type Used	Format of data	Existing data collection policy	Frequency of data collection	Comments
						assets between PowerOn and EAM					
LV Switchgear and Other	Network Performance CoF	KVA Band Per Customer	Appendix D.4.2, Table 226	Yes, but not currently mapped to the model.	PowerOn	Based on Maximum Demand, System association required to link assets between PowerOn and EAM	Network connectivity	Value in kVA	One off activity	Ad-hoc on-going network connectivity updates	CAT score will improve once mapping is developed.
LV Switchgear and Other	Financial CoF	Type Financial Rating	Appendix D.1.2.1, Table 212	Yes	N/A	Always "Non Asbestos clad", UK Power Networks does not use Asbestos clad on LV Switchgear	N/A	N/A	One off activity	N/A	

HI Asset Category	CNAIM Calculation Step	Data Required	CNAIM Document Reference	Data Collected	Data Source	Data used to provide CNAIM input	Data Type Used	Format of data	Existing data collection policy	Frequency of data collection	Comments
LV Switchgear and Other	Financial CoF	Access Financial Rating	Appendix D.1.2.2, Table 214	Yes	EAM	Based on ESQC risk code	Inspection/maintenance record	Inspection Score	Ongoing routine inspection cycle	Captured during routine asset inspection/maintenance according to Inspection and Maintenance Frequency Schedule	

Table 13. HV Switchgear (GM)

HI Asset Category	CNAIM Calculation Step	Data Required	CNAIM Document Reference	Data Collected	Data Source	Data used to provide CNAIM input	Data Type Used	Format of data	Existing data collection policy	Frequency of data collection	Comments
HV Switchgear (GM) - Primary, HV Switchgear (GM) - Distribution	Location Factor	Distance From Coast	Appendix B.3.1, Table 22	Yes	EAM, Third Party Audits/reports	Calculated using Pythagorean theorem	Derived from Asset commissioning record	Value in meters	One off activity	Derived using third party data and asset location data captured at asset commission	
HV Switchgear (GM) - Primary,	Location Factor	Altitude	Appendix B.3.1, Table 23	Yes	EAM, Third Party Audits/reports	To be mapped using external data	Derived from Asset commissioning record	Value in meters	One off activity	Derived using third party data and asset location data captured at asset commission	

HI Asset Category	CNAIM Calculation Step	Data Required	CNAIM Document Reference	Data Collected	Data Source	Data used to provide CNAIM input	Data Type Used	Format of data	Existing data collection policy	Frequency of data collection	Comments
HV Switchgear (GM) - Distribution						source					
HV Switchgear (GM) - Primary, HV Switchgear (GM) - Distribution	Location Factor	Corrosion Category	Appendix B.3.1, Table 24	Yes	EAM, Third Party Audits/reports	Calculated using corrosion rating from external data source and GIS data	Derived from Asset commissioning record	Rating	One off activity	Derived using third party data and asset location data captured at asset commission	
HV Switchgear (GM) - Primary, HV Switchgear (GM) - Distribution	Location Factor	Indoor/Outdoor	Sections 6.4.5 & 6.4.6	Yes	EAM	Based on asset situation	Asset commissioning record	Text	One off activity	Captured at asset commission or relocation	

HI Asset Category	CNAIM Calculation Step	Data Required	CNAIM Document Reference	Data Collected	Data Source	Data used to provide CNAIM input	Data Type Used	Format of data	Existing data collection policy	Frequency of data collection	Comments
HV Switchgear (GM) - Primary	Duty Factor	Switchgear - Number of Operations	Appendix B.4, Table 31	Yes	EAM	Based on asset's circuit breaker function	Inspection/maintenance record	Text	Ongoing routine inspection cycle	Captured during routine asset inspection/maintenance according to Inspection and Maintenance Frequency Schedule	
HV Switchgear (GM) - Primary, HV Switchgear (GM) - Distribution	Initial Health Score	Age	Section 6.1.6, Eq. 4	Yes	EAM	Based on Year of Manufacture, Commission Year	Asset commissioning record	Date	One off activity	Captured at asset commission or relocation	
HV Switchgear (GM) - Primary, HV Switchgear (GM) - Distribution	Observed Condition Modifier	Switchgear External Condition	Appendix B.5.6, Table 50, Appendix B.5.7, Table 55	Yes	EAM	Based on external or control boxes' data	Inspection/maintenance record	Inspection Score	Ongoing routine inspection cycle	Captured during routine asset inspection/maintenance according to Inspection and Maintenance Frequency Schedule	

HI Asset Category	CNAIM Calculation Step	Data Required	CNAIM Document Reference	Data Collected	Data Source	Data used to provide CNAIM input	Data Type Used	Format of data	Existing data collection policy	Frequency of data collection	Comments
HV Switchgear (GM) - Primary, HV Switchgear (GM) - Distribution	Observed Condition Modifier	Oil Leaks / Gas Pressure	Appendix B.5.6, Table 51, Appendix B.5.7, Table 56	Yes	EAM	Based on oil containment condition and recorded defects on gasket, oil leak, etc	Inspection/maintenance record	Inspection Score	Ongoing routine inspection cycle	Captured during routine asset inspection/maintenance according to Inspection and Maintenance Frequency Schedule	
HV Switchgear (GM) - Primary, HV Switchgear (GM) - Distribution	Observed Condition Modifier	Thermographic Assessment	Appendix B.5.6, Table 52, Appendix B.5.7, Table 57	Not Currently Collected	N/A	UK Power Networks currently do not collect thermographic information on HV Switchgear	N/A	N/A	N/A	N/A	
HV Switchgear (GM) - Primary, HV Switchgear (GM) -	Observed Condition Modifier	Switchgear Internal Condition & Operation	Appendix B.5.6, Table 53, Appendix B.5.7, Table 58	Yes	EAM	Based on condition such as how much light there are and it's shutters.	Inspection/maintenance record	Inspection Score	Ongoing routine inspection cycle	Captured during routine asset inspection/maintenance according to Inspection and Maintenance Frequency Schedule	

HI Asset Category	CNAIM Calculation Step	Data Required	CNAIM Document Reference	Data Collected	Data Source	Data used to provide CNAIM input	Data Type Used	Format of data	Existing data collection policy	Frequency of data collection	Comments
Distribution											
HV Switchgear (GM) - Primary, HV Switchgear (GM) - Distribution	Observed Condition Modifier	Indoor Environment	Appendix B.5.6, Table 54, Appendix B.5.7, Table 59	Yes	EAM	Based on cubicle and support structure, as well as their defects	Inspection/maintenance record	Inspection Score	Ongoing routine inspection cycle	Captured during routine asset inspection/maintenance according to Inspection and Maintenance Frequency Schedule	
HV Switchgear (GM) - Primary, HV Switchgear (GM) - Distribution	Measured Condition Modifier	Partial Discharge	Appendix B.6.6, Table 136, Appendix B.6.7, Table 142	Yes	EAM	Based on the recorded electrical discharge	Inspection/maintenance record	Inspection Score	Ongoing routine inspection cycle	Captured during routine asset inspection/maintenance according to Inspection and Maintenance Frequency Schedule	
HV Switchgear (GM) - Primary,	Measured Condition Modifier	Ductor Test	Appendix B.6.6, Table 137, Appendi	Yes	EAM	Based on a series of ductor readings	Inspection/maintenance record	Inspection Score	Ongoing routine inspection	Captured during routine asset inspection/maintenance according to Inspection and	

HI Asset Category	CNAIM Calculation Step	Data Required	CNAIM Document Reference	Data Collected	Data Source	Data used to provide CNAIM input	Data Type Used	Format of data	Existing data collection policy	Frequency of data collection	Comments
HV Switchgear (GM) - Distribution			x B.6.7, Table 143						cycle	Maintenance Frequency Schedule	
HV Switchgear (GM) - Primary	Measured Condition Modifier	IR Test	Appendix B.6.6, Table 138	Not Currently Collected	N/A	UK Power Networks currently do not perform IR testing on HV Switchgear	N/A	N/A	N/A	N/A	
HV Switchgear (GM) - Primary, HV Switchgear (GM) - Distribution	Measured Condition Modifier	Oil Tests	Appendix B.6.6, Table 139, Appendix B.6.7, Table 144	Yes	EAM	Based on a series of acidity, moisture, and breakdown conditions.	Inspection/maintenance record	Inspection Score	Ongoing routine inspection cycle	Captured during routine asset inspection/maintenance according to Inspection and Maintenance Frequency Schedule	
HV Switchgear (GM) - Primary, HV	Measured Condition Modifier	Temperature Readings	Appendix B.6.6, Table 140, Appendix B.6.7,	Yes	EAM	Based on blackened temperature strips	Inspection/maintenance record	Inspection Score	Ongoing routine inspection cycle	Captured during routine asset inspection/maintenance according to Inspection and Maintenance	

HI Asset Category	CNAIM Calculation Step	Data Required	CNAIM Document Reference	Data Collected	Data Source	Data used to provide CNAIM input	Data Type Used	Format of data	Existing data collection policy	Frequency of data collection	Comments
Switchgear (GM) - Distribution			Table 145							Frequency Schedule	
HV Switchgear (GM) - Primary, HV Switchgear (GM) - Distribution	Measured Condition Modifier	Trip Test	Appendix B.6.6, Table 141, Appendix B.6.7, Table 146	Yes	EAM	Based on asset's breaker trip data	Inspection/maintenance record	Inspection Score	Ongoing routine inspection cycle	Derived using third party data and asset location data captured at asset commission	
HV Switchgear (GM) - Primary, HV Switchgear (GM) - Distribution	Reliability Modifier	Reliability Factor Input	Section 6.14	Yes	Engineering Knowledge/Reports, EAM	Based on switchgear material type and number of ways	Derived from Asset commissioning record	Text	One off activity	Derived using third party data and asset location data captured at asset commission	
HV Switchgear (GM) -	Reliability Modifier	Reliability Collar Input	Section 6.14	Yes	Engineering Knowledge/Reports, EAM	Based on switchgear material type and	Derived from Asset commissioning record	Text	One off activity	Derived using third party data and asset location data captured at asset	

HI Asset Category	CNAIM Calculation Step	Data Required	CNAIM Document Reference	Data Collected	Data Source	Data used to provide CNAIM input	Data Type Used	Format of data	Existing data collection policy	Frequency of data collection	Comments
Primary, HV Switchgear (GM) - Distribution						number of ways				commission	
HV Switchgear (GM) - Primary, HV Switchgear (GM) - Distribution	PoF	No Of Units	Section 6.1	Yes	N/A	Always set to 1	N/A	Per Switchgear	One off activity	N/A	
HV Switchgear (GM) - Primary, HV Switchgear (GM) - Distribution	Safety CoF	Type Safety Rating	Appendix D.2.2.2, Table 218	Yes	EAM	Based on ESQC equipment risk	Inspection/maintenance record	Inspection Score	Ongoing routine inspection cycle	Captured during routine asset inspection/maintenance according to Inspection and Maintenance Frequency Schedule	

HI Asset Category	CNAIM Calculation Step	Data Required	CNAIM Document Reference	Data Collected	Data Source	Data used to provide CNAIM input	Data Type Used	Format of data	Existing data collection policy	Frequency of data collection	Comments
HV Switchgear (GM) - Primary, HV Switchgear (GM) - Distribution	Environmental CoF	Location Safety Rating	Appendix D.2.2.2, Table 218	Yes	EAM	Based on ESQC location risk	Inspection/maintenance record	Inspection Score	Ongoing routine inspection cycle	Captured during routine asset inspection/maintenance according to Inspection and Maintenance Frequency Schedule	
HV Switchgear (GM) - Primary, HV Switchgear (GM) - Distribution	Environmental CoF	Type Environment Rating	Appendix D.3.2, Table 221	Yes	EAM	Based on the insulation used	Inspection/maintenance record	Inspection Score	Ongoing routine inspection cycle	Captured during routine asset inspection/maintenance according to Inspection and Maintenance Frequency Schedule	
HV Switchgear (GM) - Primary, HV Switchgear (GM) -	Environmental CoF	Proximity Rating	Appendix D.3.2, Table 223	Yes	EAM	Based on asset location record	Derived from Asset commissioning record	Text	One off activity	Derived using third party data and asset location data captured at asset commission	

HI Asset Category	CNAIM Calculation Step	Data Required	CNAIM Document Reference	Data Collected	Data Source	Data used to provide CNAIM input	Data Type Used	Format of data	Existing data collection policy	Frequency of data collection	Comments
Distribution											
HV Switchgear (GM) - Primary, HV Switchgear (GM) - Distribution	Network Performance CoF	Number of Connected Customers	Appendix D.4.2, Eq. 37	Yes	PowerOn	Based on number of connected MPANS and normal network running arrangement	Network connectivity	N/A	One off activity	Ad-hoc on-going network connectivity updates	
HV Switchgear (GM) - Primary, HV Switchgear (GM) - Distribution	Network Performance CoF	Customer Sensitivity Factor	Appendix D.4.2	Yes, but not currently mapped to the model.	PowerOn	Based on Vulnerable Customer record, system association required to link assets between PowerOn and EAM	Network connectivity	Sensitivity Flag	One off activity	Ad-hoc on-going network connectivity updates	CAT score will improve once mapping is developed.

HI Asset Category	CNAIM Calculation Step	Data Required	CNAIM Document Reference	Data Collected	Data Source	Data used to provide CNAIM input	Data Type Used	Format of data	Existing data collection policy	Frequency of data collection	Comments
HV Switchgear (GM) - Primary, HV Switchgear (GM) - Distribution	Network Performance CoF	KVA Band Per Customer	Appendix D.4.2, Table 226	Yes, but not currently mapped to the model.	PowerOn	Based on Maximum Demand, System association required to link assets between PowerOn and EAM	Network connectivity	Value in kVA	One off activity	Ad-hoc on-going network connectivity updates	CAT score will improve once mapping is developed.
HV Switchgear (GM) - Primary, HV Switchgear (GM) - Distribution	Financial CoF	Access Financial Rating	Appendix D.1.2.2, Table 214	Yes	EAM	Based on ESQC risk code	Inspection/maintenance record	Inspection Score	Ongoing routine inspection cycle	Captured during routine asset inspection/maintenance according to Inspection and Maintenance Frequency Schedule	
HV Switchgear (GM) - Primary, HV Switchgear (GM) -	Environmental CoF	Bunding	Appendix D.3.2, Table 223	Yes	EAM	Based on bunding data	Derived from Asset commissioning record	Flag	One off activity	Captured at asset commission or relocation	

HI Asset Category	CNAIM Calculation Step	Data Required	CNAIM Document Reference	Data Collected	Data Source	Data used to provide CNAIM input	Data Type Used	Format of data	Existing data collection policy	Frequency of data collection	Comments
Distribution											
HV Switchgear (GM) - Primary, HV Switchgear (GM) - Distribution	Normal Expected Life	Replaced Moving Portion	Appendix B.1, Table 20	Yes	EAM	Based on whether asset has been retrofitted	Derived from Asset commissioning record	Flag	One off activity	Captured at asset commission or relocation	

Table 14. EHV Switchgear and 132kV Circuit Breakers

HI Asset Category	CNAIM Calculation Step	Data Required	CNAIM Document Reference	Data Collected	Data Source	Data used to provide CNAIM input	Data Type Used	Format of data	Existing data collection policy	Frequency of data collection	Comments
EHV Switchgear (GM), 132kV CBs	Location Factor	Distance From Coast	Appendix B.3.1, Table 22	Yes	EAM, Third Party Audits/reports	Calculated using Pythagorean theorem	Derived from Asset commissioning record	Value in meters	One off activity	Derived using third party data and asset location data captured at asset commission	

HI Asset Category	CNAIM Calculation Step	Data Required	CNAIM Document Reference	Data Collected	Data Source	Data used to provide CNAIM input	Data Type Used	Format of data	Existing data collection policy	Frequency of data collection	Comments
EHV Switchgear (GM), 132kV CBs	Location Factor	Altitude	Appendix B.3.1, Table 23	Yes	EAM, Third Party Audits/reports	To be mapped using external data source	Derived from Asset commissioning record	Value in meters	One off activity	Derived using third party data and asset location data captured at asset commission	
EHV Switchgear (GM), 132kV CBs	Location Factor	Corrosion Category	Appendix B.3.1, Table 24	Yes	EAM, Third Party Audits/reports	Calculated using corrosion rating from external data source and GIS data	Derived from Asset commissioning record	Rating	One off activity	Derived using third party data and asset location data captured at asset commission	
EHV Switchgear (GM), 132kV CBs	Location Factor	Indoor/Outdoor	Sections 6.4.5 & 6.4.6	Yes	EAM	Based on asset situation	Asset commissioning record	Text	One off activity	Captured at asset commission or relocation	
EHV Switchgear (GM), 132kV CBs	Duty Factor	Switchgear - Number of Operations	Appendix B.4, Table 31	Yes	EAM	Based on asset's circuit breaker function	Asset commissioning record	Count	Ongoing routine inspection cycle	Captured at asset commission or relocation	
EHV Switchgear (GM), 132kV	Initial Health Score	Age	Section 6.1.6, Eq. 4	Yes	EAM	Based on Year of Manufacture, Commissio	Asset commissioning record	Date	One off activity	Captured at asset commission or relocation	

HI Asset Category	CNAIM Calculation Step	Data Required	CNAIM Document Reference	Data Collected	Data Source	Data used to provide CNAIM input	Data Type Used	Format of data	Existing data collection policy	Frequency of data collection	Comments
CBs						n Year					
EHV Switchgear (GM), 132kV CBs	Observed Condition Modifier	Switchgear External Condition	Appendix B.5.8, Table 60, Appendix B.5.9, Table 66	Yes	EAM	Based on external or control boxes' data	Inspection/maintenance record	Inspection Score	Ongoing routine inspection cycle	Captured during routine asset inspection/maintenance according to Inspection and Maintenance Frequency Schedule	
EHV Switchgear (GM), 132kV CBs	Observed Condition Modifier	Oil Leaks / Gas Pressure	Appendix B.5.8, Table 61, Appendix B.5.9, Table 67	Yes	EAM	Based on oil containment condition and recorded defects on gasket, oil leak, etc	Inspection/maintenance record	Inspection Score	Ongoing routine inspection cycle	Captured during routine asset inspection/maintenance according to Inspection and Maintenance Frequency Schedule	
EHV Switchgear (GM), 132kV CBs	Observed Condition Modifier	Thermographic Assessment	Appendix B.5.8, Table 62, Appendix B.5.9, Table 68	Not Currently Collected	N/A	UK Power Networks currently do not perform Thermographic assessment on 132&EHV switchgear	N/A	N/A	N/A	N/A	

HI Asset Category	CNAIM Calculation Step	Data Required	CNAIM Document Reference	Data Collected	Data Source	Data used to provide CNAIM input	Data Type Used	Format of data	Existing data collection policy	Frequency of data collection	Comments
EHV Switchgear (GM), 132kV CBs	Observed Condition Modifier	Switchgear Internal Condition & Operation	Appendix B.5.8, Table 63, Appendix B.5.9, Table 69	Yes	EAM	Based on condition such as how much light there are and it's shutters.	Inspection/maintenance record	Inspection Score	Ongoing routine inspection cycle	Captured during routine asset inspection/maintenance according to Inspection and Maintenance Frequency Schedule	
EHV Switchgear (GM), 132kV CBs	Observed Condition Modifier	Indoor Environment	Appendix B.5.8, Table 64, Appendix B.5.9, Table 70	Yes	EAM	Based on cubicle and support structure, as well as their defects	Inspection/maintenance record	Inspection Score	Ongoing routine inspection cycle	Captured during routine asset inspection/maintenance according to Inspection and Maintenance Frequency Schedule	
EHV Switchgear (GM), 132kV CBs	Observed Condition Modifier	Support Structures	Appendix B.5.8, Table 65, Appendix B.5.9, Table 71	Yes	EAM	Based on the support structure condition observed	Inspection/maintenance record	Inspection Score	Ongoing routine inspection cycle	Captured during routine asset inspection/maintenance according to Inspection and Maintenance Frequency Schedule	
EHV Switchgear (GM), 132kV CBs	Measured Condition Modifier	Partial Discharge	Appendix B.6.8, Table 147, Appendix B.6.9, Table	Yes	EAM	Based on the recorded electrical discharge	Inspection/maintenance record	Inspection Score	Ongoing routine inspection cycle	Captured during routine asset inspection/maintenance according to Inspection and Maintenance Frequency	

HI Asset Category	CNAIM Calculation Step	Data Required	CNAIM Document Reference	Data Collected	Data Source	Data used to provide CNAIM input	Data Type Used	Format of data	Existing data collection policy	Frequency of data collection	Comments
			153							Schedule	
EHV Switchgear (GM), 132kV CBs	Measured Condition Modifier	Ductor Test	Appendix B.6.8, Table 148, Appendix B.6.9, Table 154	Yes	EAM	Based on a series of ductor readings	Inspection/maintenance record	Inspection Score	Ongoing routine inspection cycle	Captured during routine asset inspection/maintenance according to Inspection and Maintenance Frequency Schedule	
EHV Switchgear (GM), 132kV CBs	Measured Condition Modifier	IR Test	Appendix B.6.8, Table 149, Appendix B.6.9, Table 155	Not Currently Collected	EAM	UK Power Networks currently do not perform IR assessment on 132&EHV switchgear	N/A	N/A	N/A	N/A	
EHV Switchgear (GM), 132kV CBs	Measured Condition Modifier	Oil Tests / Gas Tests	Appendix B.6.8, Table 150, Appendix B.6.9, Table 156	Yes	EAM	Based on oil containment condition and recorded gasket, oil leak and other types of defects	Inspection/maintenance record	Inspection Score	Ongoing routine inspection cycle	Captured during routine asset inspection/maintenance according to Inspection and Maintenance Frequency Schedule	

HI Asset Category	CNAIM Calculation Step	Data Required	CNAIM Document Reference	Data Collected	Data Source	Data used to provide CNAIM input	Data Type Used	Format of data	Existing data collection policy	Frequency of data collection	Comments
EHV Switchgear (GM), 132kV CBs	Measured Condition Modifier	Temperature Readings	Appendix B.6.8, Table 151, Appendix B.6.9, Table 157	Yes	EAM	Based on blackened temperature strips	Inspection/maintenance record	Inspection Score	Ongoing routine inspection cycle	Captured during routine asset inspection/maintenance according to Inspection and Maintenance Frequency Schedule	
EHV Switchgear (GM), 132kV CBs	Measured Condition Modifier	Trip Test	Appendix B.6.8, Table 152, Appendix B.6.9, Table 158	Yes	EAM	Based on asset's breaker trip data	Inspection/maintenance record	Inspection Score	Ongoing routine inspection cycle	Captured during routine asset inspection/maintenance according to Inspection and Maintenance Frequency Schedule	
EHV Switchgear (GM), 132kV CBs	Reliability Modifier	Reliability Factor Input	Section 6.14	Yes	EAM	Based on switchgear material type and number of ways	Derived from Asset commissioning record	Text	One off activity	Derived using third party data and asset location data captured at asset commission	
EHV Switchgear (GM), 132kV CBs	Reliability Modifier	Reliability Collar Input	Section 6.14	Yes	EAM	Based on switchgear material type and number of ways	Derived from Asset commissioning record	Text	One off activity	Derived using third party data and asset location data captured at asset commission	

HI Asset Category	CNAIM Calculation Step	Data Required	CNAIM Document Reference	Data Collected	Data Source	Data used to provide CNAIM input	Data Type Used	Format of data	Existing data collection policy	Frequency of data collection	Comments
EHV Switchgear (GM), 132kV CBs	PoF	No Of Units	Section 6.1	Yes	N/A	Always set to 1	N/A	Per switchgear/circuit breaker	One off activity	N/A	
EHV Switchgear (GM), 132kV CBs	Safety CoF	Type Safety Rating	Appendix D.2.2.2, Table 218	Yes	EAM	Based on ESQC equipment risk	Inspection/maintenance record	Inspection Score	Ongoing routine inspection cycle	Captured during routine asset inspection/maintenance according to Inspection and Maintenance Frequency Schedule	
EHV Switchgear (GM), 132kV CBs	Safety CoF	Location Safety Rating	Appendix D.2.2.2, Table 218	Yes	EAM	Based on ESQC location risk	Inspection/maintenance record	Inspection Score	Ongoing routine inspection cycle	Captured during routine asset inspection/maintenance according to Inspection and Maintenance Frequency Schedule	
EHV Switchgear (GM), 132kV CBs	Environmental CoF	Type Environment Rating	Appendix D.3.2, Table 221	Yes	EAM	Based on the insulation used	Inspection/maintenance record	Inspection Score	Ongoing routine inspection cycle	Captured during routine asset inspection/maintenance according to Inspection and Maintenance Frequency Schedule	

HI Asset Category	CNAIM Calculation Step	Data Required	CNAIM Document Reference	Data Collected	Data Source	Data used to provide CNAIM input	Data Type Used	Format of data	Existing data collection policy	Frequency of data collection	Comments
EHV Switchgear (GM), 132kV CBs	Environmental CoF	Proximity Rating	Appendix D.3.2, Table 223	Yes	EAM	Based on asset location record	Derived from Asset commissioning record	Value in meters	One off activity	Derived using third party data and asset location data captured at asset commission	
EHV Switchgear (GM), 132kV CBs	Network Performance CoF	Maximum Demand	Appendix D.4.2, Eq. 37	Yes	PowerOn	Based on Maximum Demand, System association required to link assets between PowerOn and EAM	Network connectivity	Value in kVA	One off activity	Ad-hoc on-going network connectivity updates	
EHV Switchgear (GM), 132kV CBs	Network Performance CoF	Network Type	Appendix D.4.2	Yes	PowerOn	Always "Secure" since P2/6 compliant	N/A	N/A	One off activity	N/A	
EHV Switchgear (GM), 132kV CBs	Financial CoF	Access Financial Rating	Appendix D.1.2.2, Table 214	Yes	EAM	Based on ESQC risk code	Inspection/maintenance record	Inspection Score	Ongoing routine inspection cycle	Captured during routine asset inspection/maintenance according to Inspection and Maintenance Frequency Schedule	

HI Asset Category	CNAIM Calculation Step	Data Required	CNAIM Document Reference	Data Collected	Data Source	Data used to provide CNAIM input	Data Type Used	Format of data	Existing data collection policy	Frequency of data collection	Comments
EHV Switchgear (GM), 132kV CBs	Environmental CoF	Bunding	Appendix D.3.2, Table 223	Yes	EAM	Based on bunding data	Derived from Asset commissioning record	Flag	One off activity	Captured at asset commission or relocation	
EHV Switchgear (GM)	Normal Expected Life	Replaced Moving Portion	Appendix B.1, Table 20	Yes	EAM	Based on retrofit condition data	Derived from Asset commissioning record	Flag	Ongoing routine inspection cycle	Captured at asset commission or relocation	
132kV CBs	Observed Condition Modifier	Air Systems	Appendix B.5.9, Table 72	Yes, but not currently mapped to the model.	EAM	Further investigation required to establish data mapping rules	Inspection/maintenance record	Inspection Score	Ongoing routine inspection cycle	Captured during routine asset inspection/maintenance according to Inspection and Maintenance Frequency Schedule	CAT score will improve once mapping is developed

Table 15. HV Transformer (GM)

HI Asset Category	CNAIM Calculation Step	Data Required	CNAIM Document Reference	Data Collected	Data Source	Data used to provide CNAIM input	Data Type Used	Format of data	Existing data collection policy	Frequency of data collection	Comments

HI Asset Category	CNAIM Calculation Step	Data Required	CNAIM Document Reference	Data Collected	Data Source	Data used to provide CNAIM input	Data Type Used	Format of data	Existing data collection policy	Frequency of data collection	Comments
HV Transformer (GM)	Location Factor	Distance From Coast	Appendix B.3.1, Table 22	Yes	EAM, Third Party Audits/reports	Calculated using Pythagorean theorem	Derived from Asset commissioning record	Value in meters	One off activity	Derived using third party data and asset location data captured at asset commission	
HV Transformer (GM)	Location Factor	Altitude	Appendix B.3.1, Table 23	Yes	EAM, Third Party Audits/reports	To be mapped using external data source	Derived from Asset commissioning record	Value in meters	One off activity	Derived using third party data and asset location data captured at asset commission	
HV Transformer (GM)	Location Factor	Corrosion Category	Appendix B.3.1, Table 24	Yes	EAM, Third Party Audits/reports	Calculated using corrosion rating from external data source and GIS data	Derived from Asset commissioning record	Rating	One off activity	Derived using third party data and asset location data captured at asset commission	
HV Transformer (GM)	Location Factor	Indoor/Outdoor	Sections 6.4.5 & 6.4.6	Yes	EAM	Based on asset situation	Asset commissioning record	Text	One off activity	Captured at asset commission or relocation	
HV Transformer (GM)	Duty Factor	% Utilisation	Appendix B.4, Table 32	Yes	PowerOn	Based on average load on transformer. Association between PowerOn	Derived from telemetric data from control system	Value in kVA	One off activity	Real-time telemetric data	

HI Asset Category	CNAIM Calculation Step	Data Required	CNAIM Document Reference	Data Collected	Data Source	Data used to provide CNAIM input	Data Type Used	Format of data	Existing data collection policy	Frequency of data collection	Comments
						and EAM is required					
HV Transformer (GM)	Initial Health Score	Age	Section 6.1.6, Eq. 4	Yes	EAM	Based on Year of Manufacture, Commission Year	Asset commissioning record	Date	One off activity	Captured at asset commission or relocation	
HV Transformer (GM)	Observed Condition Modifier	Transformer External Condition	Appendix B.5.10, Table 73	Yes	EAM	Based on asset external condition	Inspection/maintenance record	Inspection Score	Ongoing routine inspection cycle	Captured during routine asset inspection/maintenance according to Inspection and Maintenance Frequency Schedule	
HV Transformer (GM)	Measured Condition Modifier	Partial Discharge	Appendix B.6.10, Table 159	Yes	EAM	Based on latest condition and defect records	Inspection/maintenance record	Inspection Score	Ongoing routine inspection cycle	Captured during routine asset inspection/maintenance according to Inspection and Maintenance Frequency Schedule	

HI Asset Category	CNAIM Calculation Step	Data Required	CNAIM Document Reference	Data Collected	Data Source	Data used to provide CNAIM input	Data Type Used	Format of data	Existing data collection policy	Frequency of data collection	Comments
HV Transformer (GM)	Measured Condition Modifier	Oil Acidity	Appendix B.6.10, Table 160	Yes	N/A	Based on latest oil sample results	Inspection/maintenance record	Oil Samping Results	Ongoing routine inspection cycle	Captured during routine asset inspection/maintenance according to Inspection and Maintenance Frequency Schedule	
HV Transformer (GM)	Measured Condition Modifier	Temperature Readings	Appendix B.6.10, Table 161	Yes	EAM	Based on temperature reading taken during asset inspection	Inspection/maintenance record	Oil Samping Results	Ongoing routine inspection cycle	Captured during routine asset inspection/maintenance according to Inspection and Maintenance Frequency Schedule	
HV Transformer (GM)	Reliability Modifier	Reliability Factor Input	Section 6.14	N/A	N/A	Not used for this asset category	N/A	N/A	N/A	N/A	
HV Transformer (GM)	Reliability Modifier	Reliability Collar Input	Section 6.14	N/A	N/A	Not used for this asset category	N/A	N/A	N/A	N/A	
HV Transformer (GM)	PoF	No Of Units	Section 6.1	Yes	N/A	Always set as '1'	N/A	Per Transformer	N/A	N/A	
HV Transformer (GM)	Safety CoF	Type Safety Rating	Appendix D.2.2.2, Table	Yes	EAM	Based on ESQC equipment risk	Inspection/maintenance record	Inspection Score	Ongoing routine inspecti	Captured during routine asset inspection/maintenance according to	

HI Asset Category	CNAIM Calculation Step	Data Required	CNAIM Document Reference	Data Collected	Data Source	Data used to provide CNAIM input	Data Type Used	Format of data	Existing data collection policy	Frequency of data collection	Comments
			218						on cycle	Inspection and Maintenance Frequency Schedule	
HV Transformer (GM)	Safety CoF	Location Safety Rating	Appendix D.2.2.2, Table 218	Yes	EAM	Based on ESQC location risk	Inspection/maintenance record	Inspection Score	Ongoing routine inspection cycle	Captured during routine asset inspection/maintenance according to Inspection and Maintenance Frequency Schedule	
HV Transformer (GM)	Environmental CoF	Size Environment Rating	Appendix D.3.2, Table 222	Yes	EAM	Based on transformer rating	Asset commissioning record	Value in kVA	One off activity	Captured during asset commission	
HV Transformer (GM)	Environmental CoF	Proximity Rating	Appendix D.3.2, Table 223	Yes	EAM, Third Party Audits/reports	Derived from external GIS data source using asset GIS	Asset location record	Value in meters	One off activity	Captured during asset commission	
HV Transformer (GM)	Environmental CoF	Bunding	Appendix D.3.2, Table 223	Yes	EAM	Always "Not Bunded" as UK Power Networks does not bund HV	N/A	Flag	One off activity	N/A	

HI Asset Category	CNAIM Calculation Step	Data Required	CNAIM Document Reference	Data Collected	Data Source	Data used to provide CNAIM input	Data Type Used	Format of data	Existing data collection policy	Frequency of data collection	Comments
						Transformers					
HV Transformer (GM)	Network Performance CoF	Number of Connected Customers	Appendix D.4.2, Eq. 37	Yes	PowerOn	Based on number of connected MPANS and normal network running arrangement	Network connectivity	N/A	One off activity	Ad-hoc on-going network connectivity updates	
HV Transformer (GM)	Network Performance CoF	Customer Sensitivity Factor	Appendix D.4.2	Yes, but not currently mapped to the model.	PowerOn	Based on Vulnerable Customer record, system association required to link assets between PowerOn and EAM	Network connectivity	Sensitivity Flag	N/A	Ad-hoc on-going network connectivity updates	CAT score will improve once mapping is developed

HI Asset Category	CNAIM Calculation Step	Data Required	CNAIM Document Reference	Data Collected	Data Source	Data used to provide CNAIM input	Data Type Used	Format of data	Existing data collection policy	Frequency of data collection	Comments
HV Transformer (GM)	Network Performance CoF	KVA Band Per Customer	Appendix D.4.2, Table 226	Yes, but not currently mapped to the model.	PowerOn	Based on Maximum Demand, System association required to link assets between PowerOn and EAM	Network connectivity	Value in kVA	N/A	Ad-hoc on-going network connectivity updates	CAT score will improve once mapping is developed
HV Transformer (GM)	Financial CoF	Type Financial Rating	Appendix D.1.2.1, Table 212	Yes	EAM	Based on transformer rating	Asset commissioning record	Value in kVA	One off activity	Captured during asset commission	
HV Transformer (GM)	Financial CoF	Access Financial Rating	Appendix D.1.2.2, Table 214	Yes	EAM	Based on ESQC location risk code	Inspection/maintenance record	Inspection Score	Ongoing routine inspection cycle	Captured during routine asset inspection/maintenance according to Inspection and Maintenance Frequency Schedule	

Table 16. EHV and 132kV Transformers

HI Asset Category	CNAIM Calculation Step	Data Required	CNAIM Document Reference	Data Collected	Data Source	Data used to provide CNAIM input	Data Type Used	Format of data	Existing data collection policy	Frequency of data collection	Comments

HI Asset Category	CNAIM Calculation Step	Data Required	CNAIM Document Reference	Data Collected	Data Source	Data used to provide CNAIM input	Data Type Used	Format of data	Existing data collection policy	Frequency of data collection	Comments
EHV Transformer, 132kV Transformer	Location Factor	Distance From Coast	Appendix B.3.1, Table 22	Yes	EAM, Third Party Audits/reports	Calculated using Pythagorean theorem	Derived from Asset commissioning record	Value in meters	One off activity	Derived using third party data and asset location data captured at asset commission	
EHV Transformer, 132kV Transformer	Location Factor	Altitude	Appendix B.3.1, Table 23	Yes	EAM, Third Party Audits/reports	To be mapped using external data source	Derived from Asset commissioning record	Value in meters	One off activity	Derived using third party data and asset location data captured at asset commission	
EHV Transformer, 132kV Transformer	Location Factor	Corrosion Category	Appendix B.3.1, Table 24	Yes	EAM, Third Party Audits/reports	Calculated using corrosion rating from external data source and GIS data	Derived from Asset commissioning record	Rating	One off activity	Derived using third party data and asset location data captured at asset commission	
EHV Transformer, 132kV Transformer	Location Factor	Indoor/Outdoor	Sections 6.4.5 & 6.4.6	Yes	EAM	Based on asset situation	Asset commissioning record	Text	One off activity	Captured at asset commission or relocation	
EHV Transformer, 132kV Transformer	Duty Factor	% Utilisation	Appendix B.4, Table 33	Yes	PowerOn	Based on average load on transformer. Associatio	Derived from telemetric data from control system	Value in kVA	One off activity	Real-time telemetric data	

HI Asset Category	CNAIM Calculation Step	Data Required	CNAIM Document Reference	Data Collected	Data Source	Data used to provide CNAIM input	Data Type Used	Format of data	Existing data collection policy	Frequency of data collection	Comments
						n between PowerOn and EAM is required					
EHV Transformer, 132kV Transformer	Duty Factor	Avg. Number Taps per Day	Appendix B.4, Table 33	Yes	EAM	Based on tapchanger count recorded during routine inspection	Inspection/maintenance record	Count	Ongoing routine inspection cycle	Captured during routine asset inspection/maintenance according to Inspection and Maintenance Frequency Schedule	
EHV Transformer, 132kV Transformer	Initial Health Score	Transformer - Expected Life Sub-division	Appendix B.1	Yes	EAM	Based on Year of Manufacture, Commission Year	Asset commissioning record	Date	One off activity	Captured at asset commission or relocation	
EHV Transformer, 132kV Transformer	Initial Health Score	Transformer - Age	Section 6.1.6, Eq. 4	Yes	EAM	Based on Year of Manufacture, Commission Year	Asset commissioning record	Date	One off activity	Captured at asset commission or relocation	
EHV Transformer, 132kV Transformer	Initial Health Score	Tapchanger - Age	Section 6.1.6, Eq. 4	Yes	EAM	Based on tapchanger Year of Manufacture, Commissi	Asset commissioning record	Date	One off activity	Captured at asset commission or relocation	

HI Asset Category	CNAIM Calculation Step	Data Required	CNAIM Document Reference	Data Collected	Data Source	Data used to provide CNAIM input	Data Type Used	Format of data	Existing data collection policy	Frequency of data collection	Comments
						on Year					
EHV Transformer, 132kV Transformer	Observed Condition Modifier	Main Tank Condition	Appendix B.5.11, Table 74	Yes	EAM	Based on asset condition of transformer main tank	Inspection/maintenance record	Inspection Score	Ongoing routine inspection cycle	Captured during routine asset inspection/maintenance according to Inspection and Maintenance Frequency Schedule	
EHV Transformer, 132kV Transformer	Observed Condition Modifier	Coolers / Radiator Condition	Appendix B.5.11, Table 75	Yes	EAM	Based on transformer cooler inspection record	Inspection/maintenance record	Inspection Score	Ongoing routine inspection cycle	Captured during routine asset inspection/maintenance according to Inspection and Maintenance Frequency Schedule	
EHV Transformer, 132kV Transformer	Observed Condition Modifier	Bushings Condition	Appendix B.5.11, Table 76	Yes	EAM	Based on asset bushing condition	Inspection/maintenance record	Inspection Score	Ongoing routine inspection cycle	Captured during routine asset inspection/maintenance according to Inspection and Maintenance Frequency Schedule	

HI Asset Category	CNAIM Calculation Step	Data Required	CNAIM Document Reference	Data Collected	Data Source	Data used to provide CNAIM input	Data Type Used	Format of data	Existing data collection policy	Frequency of data collection	Comments
EHV Transformer, 132kV Transformer	Observed Condition Modifier	Kiosk Condition	Appendix B.5.11, Table 77	Not Currently Collected	N/A	UK Power Networks currently do not collect kiosk condition	N/A	N/A	N/A	N/A	
EHV Transformer, 132kV Transformer	Observed Condition Modifier	Cable Boxes Condition	Appendix B.5.11, Table 78	Yes	EAM	Based on asset cable box condition	Inspection/maintenance record	Inspection Score	Ongoing routine inspection cycle	Captured during routine asset inspection/maintenance according to Inspection and Maintenance Frequency Schedule	
EHV Transformer, 132kV Transformer	Observed Condition Modifier	Tapchanger External Condition	Appendix B.5.12, Table 79	Yes	EAM	Based on tapchanger condition	Inspection/maintenance record	Inspection Score	Ongoing routine inspection cycle	Captured during routine asset inspection/maintenance according to Inspection and Maintenance Frequency Schedule	
EHV Transformer, 132kV Transformer	Observed Condition Modifier	Internal Condition	Appendix B.5.12, Table 80	Yes	EAM	Bassed on asset and oil related condition details	Inspection/maintenance record	Inspection Score	Ongoing routine inspection cycle	Captured during routine asset inspection/maintenance according to Inspection and Maintenance Frequency Schedule	

HI Asset Category	CNAIM Calculation Step	Data Required	CNAIM Document Reference	Data Collected	Data Source	Data used to provide CNAIM input	Data Type Used	Format of data	Existing data collection policy	Frequency of data collection	Comments
EHV Transformer, 132kV Transformer	Observed Condition Modifier	Drive Mechanism Condition	Appendix B.5.12, Table 81	Yes	EAM	Bassed on asset and mechanical condition	Inspection/maintenance record	Inspection Score	Ongoing routine inspection cycle	Captured during routine asset inspection/maintenance according to Inspection and Maintenance Frequency Schedule	
EHV Transformer, 132kV Transformer	Observed Condition Modifier	Condition of Selector & Divertor Contacts	Appendix B.5.12, Table 82	Yes	EAM	Based on flex conditions	Inspection/maintenance record	Inspection Score	Ongoing routine inspection cycle	Captured during routine asset inspection/maintenance according to Inspection and Maintenance Frequency Schedule	
EHV Transformer, 132kV Transformer	Observed Condition Modifier	Condition of Selector & Divertor Braids	Appendix B.5.12, Table 83	Yes	EAM	Based on contact conditions	Inspection/maintenance record	Inspection Score	Ongoing routine inspection cycle	Captured during routine asset inspection/maintenance according to Inspection and Maintenance Frequency Schedule	
EHV Transformer, 132kV Transformer	Measured Condition Modifier	Main Transformer Partial Discharge	Appendix B.6.11, Table 162	Yes	EAM	Based on latest condition and defect records	Inspection/maintenance record	Inspection Score	Ongoing routine inspection cycle	Captured during routine asset inspection/maintenance according to Inspection and Maintenance Frequency	

HI Asset Category	CNAIM Calculation Step	Data Required	CNAIM Document Reference	Data Collected	Data Source	Data used to provide CNAIM input	Data Type Used	Format of data	Existing data collection policy	Frequency of data collection	Comments
										Schedule	
EHV Transformer, 132kV Transformer	Measured Condition Modifier	Temperature Readings	Appendix B.6.11, Table 163	Yes	EAM	Based on winding temperature captured during asset inspection	Inspection/maintenance record	Inspection Score	Ongoing routine inspection cycle	Captured during routine asset inspection/maintenance according to Inspection and Maintenance Frequency Schedule	
EHV Transformer, 132kV Transformer	Measured Condition Modifier	Tapchanger Partial Discharge	Appendix B.6.12, Table 164	Yes	EAM	Based on latest condition and defect tapchanger records	Inspection/maintenance record	Inspection Score	Ongoing routine inspection cycle	Captured during routine asset inspection/maintenance according to Inspection and Maintenance Frequency Schedule	
EHV Transformer, 132kV Transformer	Oil Test Modifier	Transformer - Test Date	Section 6.11	Yes	EAM	Based on transformer inspection date	Inspection/maintenance record	Oil Samping Results	Ongoing routine inspection cycle	Captured during routine asset inspection/maintenance according to Inspection and Maintenance Frequency Schedule	

HI Asset Category	CNAIM Calculation Step	Data Required	CNAIM Document Reference	Data Collected	Data Source	Data used to provide CNAIM input	Data Type Used	Format of data	Existing data collection policy	Frequency of data collection	Comments
EHV Transformer, 132kV Transformer	Oil Test Modifier	Transformer - Oil Moisture	Section 6.11, Eq. 20	Yes	EAM	Based on transformer oil sampling test results	Inspection/maintenance record	Oil Samping Results	Ongoing routine inspection cycle	Captured during routine asset inspection/maintenance according to Inspection and Maintenance Frequency Schedule	
EHV Transformer, 132kV Transformer	Oil Test Modifier	Transformer - Oil Acidity	Section 6.11, Eq. 20	Yes	EAM	Based on transformer oil sampling test results	Inspection/maintenance record	Oil Samping Results	Ongoing routine inspection cycle	Captured during routine asset inspection/maintenance according to Inspection and Maintenance Frequency Schedule	
EHV Transformer, 132kV Transformer	Oil Test Modifier	Transformer - Oil Breakdown	Section 6.11, Eq. 20	Yes	EAM	Based on transformer oil sampling test results	Inspection/maintenance record	Oil Samping Results	Ongoing routine inspection cycle	Captured during routine asset inspection/maintenance according to Inspection and Maintenance Frequency Schedule	
EHV Transformer, 132kV Transformer	Oil Test Modifier	Tapchanger - Test Date	Section 6.11	Yes	EAM	Based on transformer oil sampling test results	Inspection/maintenance record	Oil Samping Results	Ongoing routine inspection cycle	Captured during routine asset inspection/maintenance according to Inspection and Maintenance Frequency	

HI Asset Category	CNAIM Calculation Step	Data Required	CNAIM Document Reference	Data Collected	Data Source	Data used to provide CNAIM input	Data Type Used	Format of data	Existing data collection policy	Frequency of data collection	Comments
										Schedule	
EHV Transformer, 132kV Transformer	Oil Test Modifier	Tapchanger - Oil Moisture	Section 6.11, Eq. 20	Yes	EAM	Based on transformer oil sampling test results	Inspection/maintenance record	Oil Samping Results	Ongoing routine inspection cycle	Captured during routine asset inspection/maintenance according to Inspection and Maintenance Frequency Schedule	
EHV Transformer, 132kV Transformer	Oil Test Modifier	Tapchanger - Oil Acidity	Section 6.11, Eq. 20	Yes	EAM	Based on transformer oil sampling test results	Inspection/maintenance record	Oil Samping Results	Ongoing routine inspection cycle	Captured during routine asset inspection/maintenance according to Inspection and Maintenance Frequency Schedule	
EHV Transformer, 132kV Transformer	Oil Test Modifier	Tapchanger - Oil Breakdown	Section 6.11, Eq. 20	Yes	EAM	Based on transformer oil sampling test results	Inspection/maintenance record	Oil Samping Results	Ongoing routine inspection cycle	Captured during routine asset inspection/maintenance according to Inspection and Maintenance Frequency Schedule	

HI Asset Category	CNAIM Calculation Step	Data Required	CNAIM Document Reference	Data Collected	Data Source	Data used to provide CNAIM input	Data Type Used	Format of data	Existing data collection policy	Frequency of data collection	Comments
EHV Transformer, 132kV Transformer	FFA Test Modifier	FFA Test Date	Section 6.13	Yes	EAM	Based on transformer oil sampling test results	Inspection/maintenance record	Oil Samping Results	Ongoing routine inspection cycle	Captured during routine asset inspection/maintenance according to Inspection and Maintenance Frequency Schedule	
EHV Transformer, 132kV Transformer	FFA Test Modifier	FFA PPM	Section 6.13, Eq. 24	Yes	EAM	Based on transformer oil sampling test results	Inspection/maintenance record	Oil Samping Results	Ongoing routine inspection cycle	Captured during routine asset inspection/maintenance according to Inspection and Maintenance Frequency Schedule	
EHV Transformer, 132kV Transformer	Reliability Modifier	Reliability Factor Input	Section 6.14	N/A	N/A	Not used for this asset category	N/A	N/A	N/A	N/A	
EHV Transformer, 132kV Transformer	Reliability Modifier	Reliability Collar Input	Section 6.14	N/A	N/A	Not used for this asset category	N/A	N/A	N/A	N/A	
EHV Transformer, 132kV Transformer	PoF	No Of Units	Section 6.1	Yes	N/A	Set as 1	N/A	Per Transformer	One off activity	N/A	

HI Asset Category	CNAIM Calculation Step	Data Required	CNAIM Document Reference	Data Collected	Data Source	Data used to provide CNAIM input	Data Type Used	Format of data	Existing data collection policy	Frequency of data collection	Comments
EHV Transformer, 132kV Transformer	DGA Test Modifier	Oil Sample Date	Section 6.12	Yes	EAM	Based on transformer oil sampling test results	Inspection/maintenance record	Oil Sampling Results	Ongoing routine inspection cycle	Captured during routine asset inspection/maintenance according to Inspection and Maintenance Frequency Schedule	
EHV Transformer, 132kV Transformer	DGA Test Modifier	Hydrogen (H2) - ppm	Section 6.13, Eqns. 21, 22 & 23	Yes	EAM	Based on transformer oil sampling test results	Inspection/maintenance record	Oil Sampling Results	Ongoing routine inspection cycle	Captured during routine asset inspection/maintenance according to Inspection and Maintenance Frequency Schedule	
EHV Transformer, 132kV Transformer	DGA Test Modifier	Acetylene (C2H2) - ppm	Section 6.13, Eqns. 21, 22 & 23	Yes	EAM	Based on transformer oil sampling test results	Inspection/maintenance record	Oil Sampling Results	Ongoing routine inspection cycle	Captured during routine asset inspection/maintenance according to Inspection and Maintenance Frequency Schedule	
EHV Transformer, 132kV Transformer	DGA Test Modifier	Ethylene (C2H4) - ppm	Section 6.13, Eqns. 21, 22 & 23	Yes	EAM	Based on transformer oil sampling test results	Inspection/maintenance record	Oil Sampling Results	Ongoing routine inspection cycle	Captured during routine asset inspection/maintenance according to Inspection and Maintenance Frequency	

HI Asset Category	CNAIM Calculation Step	Data Required	CNAIM Document Reference	Data Collected	Data Source	Data used to provide CNAIM input	Data Type Used	Format of data	Existing data collection policy	Frequency of data collection	Comments
										Schedule	
EHV Transformer, 132kV Transformer	DGA Test Modifier	Methane (CH4) - ppm	Section 6.13, Eqns. 21, 22 & 23	Yes	EAM	Based on transformer oil sampling test results	Inspection/maintenance record	Oil Sampling Results	Ongoing routine inspection cycle	Captured during routine asset inspection/maintenance according to Inspection and Maintenance Frequency Schedule	
EHV Transformer, 132kV Transformer	DGA Test Modifier	Ethane (C2H6) - ppm	Section 6.13, Eqns. 21, 22 & 23	Yes	EAM	Based on transformer oil sampling test results	Inspection/maintenance record	Oil Sampling Results	Ongoing routine inspection cycle	Captured during routine asset inspection/maintenance according to Inspection and Maintenance Frequency Schedule	
EHV Transformer, 132kV Transformer	Safety CoF	Type Safety Rating	Appendix D.2.2.2, Table 218	Yes	EAM	Based on ESQC equipment risk	Inspection/maintenance record	Inspection Score	Ongoing routine inspection cycle	Captured during routine asset inspection/maintenance according to Inspection and Maintenance Frequency Schedule	

HI Asset Category	CNAIM Calculation Step	Data Required	CNAIM Document Reference	Data Collected	Data Source	Data used to provide CNAIM input	Data Type Used	Format of data	Existing data collection policy	Frequency of data collection	Comments
EHV Transformer, 132kV Transformer	Safety CoF	Location Safety Rating	Appendix D.2.2.2, Table 218	Yes	EAM	Based on ESQC location risk	Inspection/maintenance record	Inspection Score	Ongoing routine inspection cycle	Captured during routine asset inspection/maintenance according to Inspection and Maintenance Frequency Schedule	
EHV Transformer, 132kV Transformer	Environmental CoF	Size Environment Rating	Appendix D.3.2, Table 222	Yes	EAM	Based on Transformer voltage and rating	Asset commissioning record	Value in kV and MVA	One off activity	Captured at asset commission	
EHV Transformer, 132kV Transformer	Environmental CoF	Proximity Rating	Appendix D.3.2, Table 223	Yes	EAM, Third Party Audits/reports	Derived from external GIS data source using asset GIS	Asset location record	Value in meters	One off activity	Captured at asset commission or relocation	
EHV Transformer, 132kV Transformer	Environmental CoF	Bunding	Appendix D.3.2, Table 223	Yes	EAM	Based on associated bunding asset	Derived from Asset commissioning record	Flag	One off activity	Captured at asset commission or relocation	
EHV Transformer, 132kV Transformer	Network Performance CoF	Maximum Demand	Appendix D.4.2, Eq. 37	Yes	PowerOn	Based on Maximum Demand, System association required	Network connectivity	Value in kVA	One off activity	Ad-hoc on-going network connectivity updates	

HI Asset Category	CNAIM Calculation Step	Data Required	CNAIM Document Reference	Data Collected	Data Source	Data used to provide CNAIM input	Data Type Used	Format of data	Existing data collection policy	Frequency of data collection	Comments
						to link assets between PowerOn and EAM					
EHV Transformer, 132kV Transformer	Network Performance CoF	Network Type	Appendix D.4.2	Yes	PowerOn	Always "Secure" since P2/6 compliant	N/A	N/A	One off activity	N/A	
EHV Transformer, 132kV Transformer	Financial CoF	Type Financial Rating	Appendix D.1.2.1, Table 212	Yes	EAM	Based on transformer rating	Asset commissioning record	Value in kVA	One off activity	Captured at asset commission	
EHV Transformer, 132kV Transformer	Financial CoF	Access Financial Rating	Appendix D.1.2.2, Table 214	Yes	EAM	Based on ESQC location risk code	Inspection/maintenance record	Inspection Score	Ongoing routine inspection cycle	Captured during routine asset inspection/maintenance according to Inspection and Maintenance Frequency Schedule	

Table 17. UG Cable (Gas and Oil)

HI Asset Category	CNAIM Calculation Step	Data Required	CNAIM Document Reference	Data Collected	Data Source	Data used to provide CNAIM input	Data Type Used	Format of data	Existing data collection policy	Frequency of data collection	Comments

HI Asset Category	CNAIM Calculation Step	Data Required	CNAIM Document Reference	Data Collected	Data Source	Data used to provide CNAIM input	Data Type Used	Format of data	Existing data collection policy	Frequency of data collection	Comments
EHV UG Cable (Gas), EHV UG Cable (Oil), 132kV UG Cable (Gas), 132kV UG Cable (Oil)	Duty Factor	% Utilisation	Appendix B.4, Table 30	Yes, but not currently mapped to the model.	PowerOn	Based on average asset load	Real-time telemetric data	Values in kVA	One off activity	Real-time telemetric data	
EHV UG Cable (Gas), EHV UG Cable (Oil), 132kV UG Cable (Gas), 132kV UG Cable (Oil)	Duty Factor	Operating Voltage / Design Voltage	Appendix B.4, Table 30	Yes	EAM	Based on operating voltage and designed voltage	Derived from Asset commissioning record	Values in Volt	One off activity	Captured at asset commission	
EHV UG Cable (Gas), EHV UG Cable (Oil), 132kV UG Cable (Gas), 132kV UG Cable (Oil)	Initial Health Score	Expected Life Sub-division	Appendix B.1	Yes	EAM	Based on sheath and core material type	Derived from Asset commissioning record	Text	One off activity	Captured at asset commission or relocation	
EHV UG Cable (Gas), EHV UG Cable (Oil), 132kV UG Cable (Gas), 132kV UG	Initial Health Score	Age	Section 6.1.6, Eq. 4	Yes	EAM	Based on Year of Manufacture, Commission Year	Derived from Asset commissioning record	Date	One off activity	Captured at asset commission or relocation	

HI Asset Category	CNAIM Calculation Step	Data Required	CNAIM Document Reference	Data Collected	Data Source	Data used to provide CNAIM input	Data Type Used	Format of data	Existing data collection policy	Frequency of data collection	Comments
Cable (Oil)											
EHV UG Cable (Gas), EHV UG Cable (Oil), 132kV UG Cable (Gas), 132kV UG Cable (Oil)	Measured Condition Modifier	Leakage	Appendix B.6.16, Table 172	Yes	EAM	Based on average oil topup visits	Inspection/maintenance record	Value in Litres	Ongoing routine inspection cycle	Captured during routine asset inspection/maintenance according to Inspection and Maintenance Frequency Schedule	
EHV UG Cable (Gas), EHV UG Cable (Oil), 132kV UG Cable (Gas), 132kV UG Cable (Oil)	Reliability Modifier	Reliability Factor Input	Section 6.14	Yes	EAM	Based on number of joints, cable type (Mollerhoj) and cable length	Derived from Asset commissioning record	Count, Type, Value in meters	One off activity	Captured at asset commission or relocation	
EHV UG Cable (Gas), EHV UG Cable (Oil), 132kV UG Cable (Gas), 132kV UG Cable (Oil)	Reliability Modifier	Reliability Collar Input	Section 6.14	N/A	N/A	Not used for this asset category	N/A	N/A	N/A	N/A	

HI Asset Category	CNAIM Calculation Step	Data Required	CNAIM Document Reference	Data Collected	Data Source	Data used to provide CNAIM input	Data Type Used	Format of data	Existing data collection policy	Frequency of data collection	Comments
EHV UG Cable (Gas), EHV UG Cable (Oil), 132kV UG Cable (Gas), 132kV UG Cable (Oil)	PoF	No Of Units	Section 6.1	Yes	EAM	Based on cable section length	Derived from Asset commissioning record	Value in meters	One off activity	Captured at asset commission	
EHV UG Cable (Gas), EHV UG Cable (Oil), 132kV UG Cable (Gas), 132kV UG Cable (Oil)	Safety CoF	Location Safety Rating	Appendix D.2.2.2, Table 218	Yes	EAM	Based on asset's situation	Derived from Asset commissioning record	Inspection Score	One off activity	Captured at asset commission or relocation	
EHV UG Cable (Oil), 132kV UG Cable (Oil)	Environmental CoF	Proximity Rating	Appendix D.3.2, Table 223	Yes	EAM	Based on asset location record	Derived from Asset commissioning record	Value in meters	One off activity	Derived using third party data and asset location data captured at asset commission	
EHV UG Cable (Gas), EHV UG Cable (Oil), 132kV UG Cable (Gas), 132kV UG Cable (Oil)	Network Performance CoF	Maximum Demand	Appendix D.4.2, Eq. 37	Yes	PowerOn	Based on Maximum Demand, System association required to link assets between PowerOn and EAM	Network connectivity	Value in kVA	One off activity	Ad-hoc on-going network connectivity updates	

HI Asset Category	CNAIM Calculation Step	Data Required	CNAIM Document Reference	Data Collected	Data Source	Data used to provide CNAIM input	Data Type Used	Format of data	Existing data collection policy	Frequency of data collection	Comments
EHV UG Cable (Gas), EHV UG Cable (Oil), 132kV UG Cable (Gas), 132kV UG Cable (Oil)	Network Performance CoF	Network Type	Appendix D.4.2	Yes	PowerOn	Always "Secure" since P2/6 compliant	N/A	N/A	One off activity	N/A	

8 Appendix B – Inspection and Maintenance Frequency Schedule

Confidential.

9 Appendix C – SKM asset condition audit report

Confidential.