

Applies to: SSEPD Staff	Information Gathering Plan for Common Network Asset Indices Methodology (CNAIM)	TG-PS-1001
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Information Gathering Plan

for

**Common Network Asset Indices Methodology
(CNAIM)**

Standard Licence Condition 51.12 - 16

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2 SUMMARY

- 2.1 This Information Gathering Plan (IGP) documents how Scottish and Southern Energy Power Distribution (SSEPD) will collect and apply the data needed to populate the Common Networks Asset Indices Methodology (CNAIM). It defines the work currently underway or planned to be undertaken and the enduring requirements for this as a business as usual activity. Process changes are being introduced to ensure current requirements are met and to enable future improvement of information, satisfying the ongoing requirement of the CNAIM as required under the Standard Licence condition 51.
- 2.2 The IGP identifies the data requirements of the existing Condition Based Risk Management (CBRM) system and those additional requirements to meet the obligations of the CNAIM modelling. It further identified the gaps which exist between the two modelling requirements, how these are being addressed and the timescale over which SSEPD plans to address and report on as part of the annual Secondary Deliverables mechanism reporting requirements.
- 2.3 Between the existing CBRM system and the CNAIM modelling SSEPD has identified 230 data point differences, the data gap and has categorised these into two groups:
- Those it has plans to address and collect, detailed in this IGP.
 - Those it proposes not to collect and the default modelling position being adopted.
- 2.4 The initial data alignment has taken place to ensure the volumes and minimum condition requirements were completed for 24 of the 25 asset classifications by the end of July 2016. Further improvements are planned through to 30 December 2016. This will be followed by steady increase in the scope of the data being collected, enabled by the changes to working practises within SSEPD's routine inspection processes. SSEPD will undertake a detailed assessment and update of the amended Network Asset Workbook (NAW) in the lead up to the required submission for the 30 December 2016. Annual improvements will be reported via the Secondary Deliverables mechanism thereafter.
- 2.5 Based on current maintenance inspection frequencies, 24 of the 25 of assets will be populated by the end of 2021. To fully populate the data on link boxes will take until 2024.

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- 2.6 This document will be updated for the NAW submission of 30 December 2016 to reflect any further changes, with a subsequent review in advance of the start of the next financial year, 31 March 2017. Thereafter, proportionate annual reviews of SSEPD's information gathering plan will reflect any updates and changes to the field data and CNAIM. This annual review requirement will be included in the SSEPD annual regulatory reporting plan.

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3 OBJECTIVES

The objectives of the IGP are:

- 3.1 To define SSEPD's current position and proposed position on data population of the Common Network Asset Indices Methodology (CNAIM) system to meet the requirements of Standard Licence condition 51.
- 3.2 To describe how SSEPD will meet or exceed the minimum data point requirements across the population of models required by CNAIM.
 - 3.2.1 For SSEPD's Southern Electric Power Distribution (Ofgem reference - SSES) This is up to 863 data points across 25 CNAIM models, and,
 - 3.2.2 For Scottish Hydro Electric Power Distribution (SSEH) which excludes Transmission 132kV asset categories. This is up to 591 data points across 17 CNAIM models.
- 3.3 To identify those data points which SSEPD does not consider are required to successfully populate and apply CNAIM. This is currently 98 data points.
- 3.4 To present a schedule of activities required to populate the models for CNAIM by 30 December 2016.
- 3.5 To develop and apply processes for the compilation and review of ongoing data gathering. To demonstrate how these support the submission of SSEPD's annual secondary deliverable outputs.
- 3.6 To develop then demonstrate a robust monitoring tool which assesses the completeness of CNAIM data and its use to continuously assess the progress being made.

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4 BACKGROUND

- 4.1 In 2015 having reviewed SSEPD's RII0-ED1 business plan, Ofgem concluded that the business had not sufficiently justified its Network Asset Indices Methodology. Standard Licence Condition 51(f) was 'switched on' requiring SSEPD to amend its existing methodology to align with best business practice and adopt a robust reporting solution. On this basis SSEPD decided to implement the EA Technology Limited (EATL) CBRM software product which was already being utilised by four of the six UK DNOs in various revisions.
- 4.2 The SSEPD's CBRM Project identified that verification of the asset data required to populate the new CBRM system would be necessary. SSEPD commissioned a dedicated project team, the Asset Data Project (ADP), to validate and cleanse the required network asset data by the end of July 2016.
- 4.3 Delivering ADP's objective ensured key requirements for CBRM would be met. Furthermore it facilitated interventions to tackle both the quality and consistency of the data for the key asset categories required for CNAIM within the CBRM system.
- 4.4 The details of the scope and delivery of the ADP has been discussed with Ofgem directly and is summarised later in this section. It was a limited term project focused on rectifying any identified data inconsistencies to cleanse these using agreed processes, populate data gaps and ensure that the enduring processes are robust and consistent. The ADP completed the main scope of its work by the end of July 2016. The results are now being deployed to populate key data to maximise the use of the models utilised in CNAIM.

CBRM within SSEPD

- 4.5 To prepare for the changes in RII0-ED1, Ofgem's intention to expand Network Risk to other asset categories and the need to improve SSEPD's Asset management capabilities, a project to introduce an automated and improved approach towards Network Risk was established in August 2014.
- 4.6 Since this project commenced, SSEPD has engaged EA Technology Limited (EATL), recognised as leaders in software development and application in this field. Its skills are being fully utilised by all the other Distribution Network Operators (DNOs) in the UK as well as many overseas organisations. It is able to facilitate the design and develop an all-encompassing solution to meet SSEPD's licence requirement for all the major identified asset groups reportable to the regulator for both SSEPD's Distribution licences (SHEPD & SEPD).
- 4.7 SSEPD deployed the CBRM software product from EATL on a release basis. The initial release went live in SSEPD's Distribution business on the 24 November 2015 covering

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all non-linear assets for SHEPD and SEPD licence areas. The next release covered all linear assets and went live on the 22 January 2016 at which time SSEPD achieved an automated CBRM system. This utilises automated processing and updates from SSEPD's present asset data within SSEPD's main core IT operating systems before presenting the results in a recognised Ofgem standard reporting format.

- 4.8 Future releases of CBRM are under review with plans to deliver further enhancements to the existing models as well as a potential major additional development. This will provide more detailed intervention modelling incorporating cost benefit analysis and optioneering. This will be reviewed in the next 12 months.

CBRM and CNAIM requirements

- 4.9 In parallel with this work for SSEPD's CBRM system is the requirement to introduce and implement CNAIM for the same group of assets which SSEPD has developed for SSEPD's CBRM solution.
- 4.10 The requirements for data in the CNAIM was reviewed during the development of the methodology and assumed that following the original submission in July 2015 that the main data requirements to be utilised within the models would not change significantly. The finalised version and requirements were not confirmed until the letter of direction from Ofgem issued on 1 February 2016.
- 4.11 Following further work undertaken by the DNO working group, some minor alterations are now proposed to the CNAIM as submitted and a consultation processes is to be undertaken in September 2016 to seek agreement and approval for these changes in line with the requirements of SLC 51 (I). SSEPD do not envisage any changes to the identified data requirements covered by this document as this time and are working on this basis within this IGP.
- 4.12 A full data analysis exercise was carried out within SSEPD during December 2015 and January 2016 to compare the final data specification documentation issued by EATL, appointed as the preferred vendor to supply the CNAIM system of models to all the UK DNOs, and that which was already being captured in the data specifications for SSEPD's own SSEPD CBRM system. This identified a number of additional data points for consideration against SSEPD's current processes and assessment of potential changes to working practices to collect this data.
- 4.13 In simple terms, SSEPD has identified the need to supplement the existing data requirements developed for CBRM with additional requirements for CNAIM. This forms the identified gap in data which this IGP addresses and the timescales in which this will be delivered. This is covered in greater detail in **Section 5.5** and outlined in **Table 1**.
- 4.14 This review compared the complete set of identified data points listing for CNAIM with those already available to CBRM to identify those data items which could be directly

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mapped over to meet the requirements. Subsequently further reviews have taken place to see what existing processes and procedures already capture any missing data points. These have been detailed in the IGP as within categories 2 and 3 within **Attachment 1a** of this IGP.

- 4.15 The new Asset Management team, in conjunction with the CBRM project team, has been reviewing how all the data points identified as categories 4 and 5 could be collected. Existing processes and procedures including collection systems were reviewed including how data will be stored and then passed over to the CNAIM.
- 4.16 Category 6 items have also been reviewed in this process with a view to identifying whether the changes required for 4 and 5 create the opportunity to commence collection of some category 6 data points. The decision to extend the collection period for category 6 items or not, is being evaluated on the basis of marginal value; the benefit the additional data has in the CNAIM models versus the cost of implementing the change to include them in the collection process. Part of the analysis in this process is to quantify the benefits by assessing if we have all the age based data input, we will simulate the inputs of category 6 data points and assess whether our current position is valid. SSEPD will confirm this position with our December 2016 revision of the IGP.
- 4.17 This is an ongoing process which has informed this updated version of the IGP with further movement in categorisation of the data points from the original version of this IGP. It will continue to be reviewed and will be reflected in future updates to this document.
- 4.18 An example of this was a review completed in anticipation of the requirements for CNAIM and the timing of winter inspections for 'Secondary Substation' inspections. SSEPD updated processes for these asset classifications, HV Switchgear, HV Transformers (GM) and LV Switchgear in November 2015 to include all the known additional data points which had been confirmed at this time to allow these to be collected by June 2016. A further review will be required before the next annual inspections commence in November 2016.
- 4.19 SSEPD has just completed a similar review of 'Primary Substation' inspection requirements and data processing. A pilot of a tablet based application to be used as the collection mechanism commenced in September 2016. This starts the process of collecting revised data for these asset groups to meet the additional needs of data by December 2016.
- 4.20 Further reviews are now under way for linear assets which are carried out and collected over a greater time period. Considerations need to include assessing whether there is any benefit / data gap which merit or need to be addressed. The effort involved in trying to accelerate this process could be very costly relative to the limited benefit an increase in data brings; the benefits need to be evaluated on this basis.

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- 4.21 Cable assets at the higher voltages have a more frequent inspection regime so again SSEPD plans to review these in line with the CNAIM requirements and to update the processes for a completion of data collection by December 2016.
- 4.22 Asset such as LV UGB and LV pillars, out-with a substation are currently under review; these are being planned on a similar timescale to that of the linear assets.

Information gathering requirements for CBRM

- 4.23 During the building of SSEPD's CBRM system it was well aware of the ongoing discussion and development of the CNAIM requirements. SSEPD ensured close alignment of the models being developed for both solutions. Although the specific detail of all the attributes and therefore data requirements were not known or finalised during the development of SSEPD's CBRM system, certain identified data requirements were incorporated in preparation for CNAIM.
- 4.24 For SSEPD's CBRM models, the level of condition and criticality data inputs focussed on the sources of data available as part of regular business processes. This ensured maximum use was being made of current processes rather than creating new requirements. Where SSEPD had identified a requirement for further data or detailed analysis, additional gathering exercises and changes to SSEPD's policy and procedures were implemented in order to commence the gathering process.
- 4.25 This work commenced following an extensive series of workshops. These were held with business specialists, policy representatives, asset managers, regulatory reporting, and maintenance and inspection staff. This ensured that all known and current data sources for condition and health assessment information were being considered and utilised. This approach allowed us to review the available data and assess its use or potential duplication as the models were developed.
- 4.26 The end result identified 1,089 data points across the 25 asset groups for use in SSEPD's CBRM models. More detail of how this then relates to the population of the CNAIM models is detailed in the next section of the IGP, section 5 Approach.
- 4.27 SSEPD will continue to make improvements in its inspection and data gathering processes targeting the improved quality of data. This will employ quality checks and data assurance procedures involving internal Audit teams as well as systematic external assurance to incorporate best practise from across the industry and other similar sectors.
- 4.28 SSEPD is in the process of securing a framework agreement for an enduring period. This builds upon the lessons learned through a number of independent quality assurance reviews which have recently been commissioned in relation to data activities. This will enable SSEPD to access the professional services of a recognised independent assurance organisation. Their task would include carrying out an annual

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review of the IGP progress, asset age profiles and, health and criticality indices all associated with the SSEPD's CBRM and CNAIM systems. This would be with a view to providing SSEPD reports on asset data assurance.

- 4.29 As SSEPD reviews and introduces additional data points to the models, not already captured or available for the models to use, it needs to determine whether each change has a material effect on its asset indices. It is SSEPD's intention to continue with clear and transparent reporting of material changes to its asset indices.
- 4.30 An example of this is where the introduction of missing age data produces a result which was previously not possible from the model. This will affect the asset volumes as well as the health indices distribution for the actual assets. Although SSEPD may have already held condition data for the asset, the model was not able to include the asset in the overall volumes as the initial calculation for the methodology was not possible where the fundamental asset age data was missing. The profile and distribution of assets within an asset category will change to reflect the introduction of additional assets. In the case of an additional condition data point becomes available, depending on the asset category, there will be far less impact on the volumes and the material change less significant.
- 4.31 Similarly, the introduction of several of the test result type data points can influence the model output significantly, in particular the effect of oil testing for a transformer where a significant level of specific chemicals being detected has a very high influencing factor on the condition of an asset. The introduction of additional or more frequent oil testing on transformers will make a material difference to the understanding of the risk of the asset.

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5 APPROACH

- 5.1 As noted above, all the data points which form the gap between the CBRM and CNAIM have been assessed and classified into one of six categories and summarised with regard to the approach to be taken in the list below.
- 5.2 SSEPD's proposed high level approach to information gathering for each data point category is as follows:
- 5.2.1 For data points in Category 1, which is data currently collected and is used in CBRM, SSEPD will continue to populate the CBRM database with monthly cleansed data updates from the ADP via primary system data imports until the main work completes by November 2016.
- 5.2.2 For data points in Category 2, which is data SSEPD currently has collected for other purposes but does not use, additional mapping from SSEPD's core data systems will be used to load as required into the CBRM database and verify its impact on the models.
- 5.2.3 For data points in Category 3, which is data SSEPD currently collects but does not have in a usable format, SSEPD will review the collection mechanism with business operations and convert to a usage format then load into the CBRM database and verify its impact on the models.
- 5.2.4 For data points in Category 4, which is data SSEPD currently does not collect, SSEPD will review the processes to introduce this to SSEPD's collection mechanisms, and will load into the CBRM database and verify its impact on the models.
- 5.2.5 For data points in Category 5, which is data SSEPD currently does not collect and is considered more difficult to gather, it may require significant changes to SSEPD's processes and procedures, and to be incorporated into SSEPD's routine inspection and maintenance schedule. SSEPD will then load changes into the CBRM database and verify its impact on the models.
- 5.2.6 For data points in Category 6, which is data SSEPD currently does not collect, there are currently no plans to progress the collection or assessment at this stage and no plans to load into the CBRM database.
- 5.3 For models which appear to take an extended period of time to be fully populated SSEPD will investigate options to improve this.
- 5.4 Details of data point categories 1 to 6 are provided in **Table 2**; see page 14, which also identifies the availability of the data. All 230 specific data items which fall into data

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categories 1 to 5 are identified with the specific data point information are provided in **Attachment 1a** and those identified as category 6 are provided in **Appendix 1b**.

- 5.5 **Table 1** below summarises the data points within CBRM already being collected or gathered by SSEPD. It also indicates the common data points, gap and difference between this and those required to fully populate the CNAIM models.

Table 1: Data point summary

Modelling system	No of Data Points	No of Common data points	Data points Gap	No of proposed not gathered	Balance to be collected	Data points for collection
CBRM	1,089	633				1,089
CNAIM	863	633	230	98	132	765

- 5.6 In terms of volumes of data points, the CNAIM modelling requires SSEPD to supply 863 data inputs compared to the 1,089 which SSEPD is utilising in the CBRM models however only 633 of these data points are common to both systems. A full list of these data points can be provided on request.
- 5.7 There are 230 additional items not currently being used in SSEPD's CBRM models which have been classified into the categories 2 to 6, with the existing 633 data points all being categorised as 1 - either needing no additional action for CNAIM or already forms part of SSEPD's ongoing CBRM data work.
- 5.8 Of the 230 additional items, SSEPD has identified 98 data points that it is not proposing to provide for at this stage and are therefore categorised as 6, leaving the balance of 132 data points being considered in this IGP.
- 5.9 The total number of data points for collection will therefore be 765. This is the combination of the 633 points common between SSEPD's CBRM and CNAIM, plus the identified balance to be collected of 132.
- 5.10 SSEPD's CBRM system has been specifically tailored and designed to maximise the use of existing asset data and condition points currently available to use from corporate asset management systems. The total number of common data points required in the CNAIM models and that of the CBRM system is 633, details of which is shown in **Table 1** above. The SSEPD's CBRM models utilise a further 456 points.
- 5.11 In general, these additional points provide SSEPD with a more granular view of the detailed condition of specific assets. This in turn allows it to consider many more forms of intervention. By definition the CNAIM is a 'common' set of data points to be utilised by all DNOs.

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- 5.12 An example of this may be where CNAIM only has a single condition data point for a specific asset component where SSEPD may be using four subcomponent data points providing a more granular lower level analysis of the asset. For CNAIM, SSEPD then combine these data points through the transformation interface required for CNAIM and end up with a single data point on condition.
- 5.13 Conversely SSEPD may not currently gather a data point listed in CNAIM which other DNOs consider to be a fair measure of an asset condition. SSEPD has assessed this condition point as an appropriate additional / alternative or new measure which SSEPD will now gather. These are then detailed in the IGP as new data points for CNAIM.
- 5.14 This substantiates the rationale for differences in SSEPD's data point volumes between the CBRM system and those that are proposed for CNAIM. **Table 3** details the additional points which SSEPD consider worthwhile or necessary to produce satisfactory results out of the CNAIM process but not essential for the CBRM modelling tool.
- 5.15 Category 6 data points are classified as such because SSEPD either already has sufficient data points to drive the model and produce satisfactory output from CNAIM or, that the testing is not current in policy to undertake routinely. Therefore, the data is not available to add into the model at this point in time. However these data points will be regularly reviewed to assess the impact of omitting this data point on the performance of the model. Appropriate action will be taken to address this should justification for additional data gathering emerge.
- 5.16 In the case of specific asset categories, including switchgear, CBs and transformers there are a number of data points associated with specific types of testing which SSEPD does not routinely undertake as part of existing procedures. This may be due to the type or age of assets or the requirement for an outage to carry out the test which may not be practical or cost effective for the added benefit this additional data may provide. Other DNOs may already have it include it within their process demonstrating the uniqueness of individual DNO policies and practice.

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Table 2: Data category classification

Data Category	Description	Action to Implement	Comments	Already Collected	Readily available	Currently used
1	Data is collected and used in the Asset Condition assessment process for CBRM.	No action required		Y	Y	Y
2	Data is collected but not currently used in the Asset Condition assessment process but can be utilised in CNAIM.	Review suitability of data sources and develop automated data mapping to accommodate in the CNAIM database sets.		Y	Y	N
3	Data is available but not in a format that can be automatically loaded without intervention.	Review what can be developed or changed in the short term to address this to a usable format.	Potential to reclassify some of these requirements as per category 5.	Y	N	N
4	Data is not currently collected but can be with minimal changes to processes.	Create a new data requirement in the Question sets, modify the data structures in SSEPD's systems to hold data then as category 2 above.	This will be reviewed at the appropriate level and then action to gather. It will take an inspection cycle to implement as it is not intended to facilitate special inspection regimes.	N	N	N
5	Data is not currently collected and will require changes to maintenance practice, data collection and all associated systems	Requires modification to current maintenance practice to permit data collection and either development as per category 3 or create new data retention systems.	This area of data collection is mainly associated with measured data requirements. These measurements are associated with the internal condition of an asset, requiring the modification of maintenance processes.	N Difficult data collection change	N	N
6	It is not intended to collect this data.	Either: a) The cost of data collection outweighs the benefit from use of the data or b) SSEPD does not intend to report against the CNAIM category in RIIO-ED1.		N/A or N No intention to collect currently	N	N

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Table 3: Data points by asset category

CNAIM Model	Asset Category	Total CNAIM Data Points	Data Points proposed not to gather
CM1	LV OHL Support	27	0
CM2	LV UG	22	0
CM3	LV Switchgear and Other	39	6
CM4	HV OHL Support - Poles	27	0
CM5	HV Switchgear (GM) - Primary	53	17
CM6	HV Distribution Switchgear	46	12
CM7	HV Distribution Transformers	38	3
CM8	EHV Poles	25	0
CM9	EHV OHL Fittings	31	1
CM10	EHV OHL Conductor (Tower Lines)	28	0
CM11	EHV OHL Support - Towers	29	0
CM12	EHV UG Cable (Gas)	22	0
CM13	EHV UG Cable (Non Pressurised)	18	0
CM14	EHV UG Cable (Oil)	24	0
CM15	Submarine Cables	40	6
CM16	EHV Switchgear (GM)	53	17
CM17	EHV Transformers	69	4
CM18*	132kV OHL Fittings	28	1
CM19*	132kV OHL Conductor (Tower Lines)	23	0
CM20*	132kV Tower	26	0
CM21*	132kV UG Cable (Gas)	25	3
CM22*	132kV UG Cable (Non Pressurised)	24	6
CM23*	132kV UG Cable (Oil)	26	3
CM24*	132kV Circuit Breakers	55	15
CM25*	132kV Transformer	65	4
	Totals	863	98
	SSEH* by Licence	591	66
	SSES by Licence	863	98

*These asset categories not applicable in Scotland as Transmission owned assets.

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5.17 As shown in **Table 1**, SSEPD has identified 230 additional data points for the CNAIM models compared to those utilised within SSEPD’s CBRM modelling solution. This plan describes the method by which SSEPD plan to address this gap separating them into two classifications:

- Those it has plans to address and collect, details in this IGP, categories 2 to 5.
- Those it considers as not being provided, with justification, and the default modelling position being adopted. These items will remain under review, category 6.

5.18 SSEPD considers category 6 items are those that are not currently collected through any existing processes or procedures nor would add any value to the outputs from the models. Therefore the decision to collect them has to identify the benefit of the data being supplied to the model and the effect of this additional data point will have on the specific asset group. This must be balanced with the cost of the change in systems to capture, as well as changes to processes and procedures, training to obtain consistency in evaluation and recording the data points. If all this effort is well justified then SSEPD will bring in the additional data point.

5.19 The majority of the areas classified as category 6 items, see **Attachment 1b**, not currently proposed for collection are data points which fall into 3 key subsets; Testing and test results; Internal examinations; or additional items already assessed by other collective means.

5.20 An example of the category 6 testing and test results includes the requirement for routine / regular outages. This puts customers at increase system security risk, increases operational costs without any track record yet established to justify the benefits of introducing this additional data.

5.21 **Table 2** contains a description and comments on each data category classification. As such a category 5 data point is where for SSEPD the *‘data is not currently collected and will require changes to maintenance practice, data collection and all associated systems’*. Some of these data points may appear ‘easy’ to collect, however, the required changes at this time may be complex, making it difficult to justify the increased cost in doing so until other drivers for the change are also incorporated e.g. procedural changes and collection methods within the asset management system during 2017/18.

5.22 Below are a number of specific examples to illustrate the rationale for this treatment of category 5 data points:

5.22.1 One example is the external condition assessment, e.g. kiosk condition. These have been classified as a category 5 as they are not currently data points which are collected individually but assessed within the inspection process collectively as auxiliary or ancillary equipment associated with the main asset. As such the question SSEPD will consider over time is whether SSEPD should map into the CNAIM the existing ‘collective’ data point, what effect

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that has on the model and the weighting within the factors being applied by the CNAIM calibration. SSEPD will also investigate breaking these down into the individual components and introducing all the change required to do so for a justifiable cost.

- 5.22.2 A further example is where SSEPD currently does not collect what may appear to be obvious data points. In such instances there are other more appropriate indicators of the specific asset condition which are better indicators of the condition of the asset rather than a generic assessment of the 'indoor environment' which we have currently classified as category 6. With 132kV CBs specifically, SSEPD has very few assets in an indoor environment and the actual condition of the equipment, its pipe work, cabinets etc. are better indicators of the effect of the asset environment than a general measure where the 'indoor environment' is not a relevant measure of the asset condition.
- 5.22.3 For this reason SSEPD has chosen not to add an additional data collection point or change processes, procedures, forms and corporate systems at this time. The benefit from all this additional work for the few assets impacted does not merit the cost or effort of doing so. The effect in the model of not supplying this specific data point in this way is currently minimal when other associated health indicators can drive the model and achieve the same result. This position is similar for the HV Switchgear (GM) – Primary, and EHV Circuit Breakers on the same basis although the volumes are higher. SSEPD will continue to monitor this and reassess its position as it learns from the use of CNAIM.
- 5.22.4 SSEPD has proposed an option to include a mapping for the 'Indoor environment' to an existing 'Local environment' data point available in the CBRM models for these asset categories. This is a 'by exception only' reporting field to identify if there is any specific issue on site which is causing accelerated deterioration to an asset's condition which supplements the above data points, for example in a quarry. This is not populated for all assets and only for severe exceptional cases.
- 5.22.5 Operational adequacy, SSEPD has several other data points which relate to the operational measurements of the LV Switchgear. Again the need to add this additional field was considered unnecessary where the other data points were already being collected and provided a reliable measure feeding into the modelling to achieve the same result.
- 5.23 There is no requirement on the DNOs under CNAIM to provide all the data points for all the models. This has informed the approach described above.
- 5.24 SSEPD has exercised its judgement on the merits of various data points and currently indicated 98 data points for which SSEPD has no plans to gather. However as SSEPD loads data into the CNAIM models and understand the performance of the models through comparison with the CRBM models SSEPD may choose to include some of these 98 data points in due course. Hence

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this would form part of the ongoing review of internal processes, procedures and form the basis of an update to the IGP in due course.

- 5.25 It is SSEPD understanding that under the requirements of the CNAIM, the DNOs are required to confirm their ability to implement a CNAIM solution and to populate it as required. This includes the option to utilise 'default' values where the DNO does not currently have the required information, has no plans to gather the information or currently cannot justify the additional cost or resource to merit the gathering or collection of this data. SSEPD intends to populate 765 data points of the 863 available which it believes is the appropriate number at this point in time and meets the requirements of CNAIM.
- 5.26 SSEPD proposes to address the 98 items identified in **Table 3** by utilising the default setting within the set calibration of the models. These specific items are listed in **Attachment 1b** under category 6.
- 5.27 SSEPD's target is to achieve the delivery of the 132 required additional data points in a staged process of delivery and improvement with key milestones achieved at the end of July 2016 and December 2017. Progress will be reported thereafter in the annual Secondary deliverables reporting mechanism as required and detailed with Standard Licence Condition 51.
- 5.28 Initial activities are being completed as part of SSEPD's current CBRM data collection requirements and SSEPD's specially commissioned Asset Data Project (ADP). SSEPD's approach to data improvement for all the populated data points for the CNAIM proposal, 863, is setup with a reporting mechanism and analysis tool in place to monitor the population of the data and its progress to completeness. SSEPD will review the data improvements and population on a monthly basis. A high level output of this can be seen as an example in **Appendix 2**.
- 5.29 SSEPD's current view on the timescales for full population of each model, beyond age data which is forecast to be populated by December 2016, is shown in **Table 4** and is considered to follow a linear progression. This is on the basis that work to collect the additional data is either in place and underway as part of the specific ADP activity or it is being incorporated into revised business processes and procedures to be collected during the routine inspection and maintenance processes in due course as per the SSEPD agreed intervals.
- 5.30 On this basis, SSEPD expects to have full population of all SSEPD's data to populate the CNAIM models complete by July 2021. One exception is the Network's LV underground equipment which is on a longer inspection regime. Although this work has already commenced, it is not scheduled to be completed until 2024 and will be reported in the July 2024 Secondary Deliverables reporting pack. The high level plan for this is shown in **Appendix 1** and its delivery is detailed further in the next section of the IGP. If this timescale is identified as too long, SSEPD would review its inspection frequencies to improve this.

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Table 4: Planned completion dates for CNAIM models by asset category

Model	Asset Category	Inspection Frequency	Planned Completion date
CM1	LV OHL Support	4 Years	July 2021
CM2	LV UGB	8 Years	July 2024
CM3	LV Switchgear and Other	Annually	December 2017
CM4	HV OHL Support - Poles	4 Years	July 2021
CM5	HV Switchgear (GM) - Primary	Quarterly	December 2017
CM6	HV Switchgear (GM) – Distribution	Annually	December 2017
CM7	HV Transformers (GM)	Annually	December 2017
CM8	EHV OHL Support - Poles	4 Years	July 2021
CM9	EHV OHL Fittings	4 Years	July 2021
CM10	EHV OHL Conductor (Tower Lines)	4 Years	July 2021
CM11	EHV OHL Support - Towers	4 Years	July 2021
CM12	EHV UG Cable (Gas)	Quarterly	December 2017
CM13	EHV UG Cable (Non Pressurised)	Not Inspected	December 2017
CM14	EHV UG Cable (Oil)	Quarterly	December 2017
CM15	Submarine Cables	Annually	December 2017
CM16	EHV Switchgear (GM)	Quarterly	December 2017
CM17	EHV Transformers	Quarterly	December 2017
CM18	132kV OHL Fittings	2 Yearly	July 2019
CM19	132kV OHL Conductor (Tower Lines)	2 Yearly	July 2019
CM20	132kV OHL Support - Tower	2 Yearly	July 2019
CM21	132kV UG Cable (Gas)	Quarterly	December 2017
CM22	132kV UG Cable (Non Pressurised)	Not Inspected	December 2017
CM23	132kV UG Cable (Oil)	Quarterly	December 2017
CM24	132kV CBs	Quarterly	December 2017
CM25	132kV Transformer	Quarterly	December 2017

5.31 SSEPD's projected full implementation timescales are based on its experience of managing network assets and SSEPD believes these are appropriate for each asset category. Historically these periods have changed over time when asset designs change, manufacturer's specifications changes and understanding of the needs of the assets from operational experience dictates. SSEPD recognises that many of the timescales are initially set on recommendations from the manufacturers, or by mandatory or statutory requirements. However, if after a period of time and programme of regular inspections SSEPD believe it is

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more cost effective to vary the periods then internal review procedures allow a suitable rigor to be applied and new intervals agreed.

5.32 Many of the lengthy periods are also associated with a measure of the risk, the volume of the assets and the resource and costs associated with any increase in the frequency to the additional value this adds. In many cases the frequency of inspection may be further extended if the current frequency identifies no change in the condition historically over the current periods and no longer merits the current frequency. SSEPD considers current inspection periods are appropriate and will be in alignment with the industry. SSEPD accepts there may be different drivers within each DNO to manage their own frequencies in line with their own asset management policies.

5.33 Planned progress to achieving completeness for the data points is outlined in **Table 4** for each of the asset categories. The majority of these are scheduled to be completed by July 2019. Of the remaining assets which include the list below, SSEPD expect to be 100% complete by the end of RIIO-ED1 with the single exception being LV UG which will be 87.5% complete.

- LV UG
- LV OHL Support
- HV OHL Supports – Poles
- EHV Poles
- EHV OHL Fittings
- EHV OHL Conductor (Tower Lines)
- EHV OHL Support – Towers

5.34 The forecast 87.5% data gathering progress for LV UG at the end of 2024 reflects attainment of seven out of an eight year inspection cycle.

5.35 SSEPD forecasts all data points will have been subject to at least one inspection cycle by July 2024.

5.36 The data to allow the modelling of the LV UG assets is currently being identified and until this is concluded the model will not be able to provide an output. SSEPD understands this is likely to be an issue across a number of DNOs. Due to the high volume of assets SSEPD has forecast an extended routine inspection programme to revisit all assets in this category.

5.37 The key issue relates to the installation date of LV UGBs where this has not been historically recorded in linear asset source data. SSEPD is considering referencing the connecting cable installation date to establish a quality assured process to ascertain the probable installation

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date by associated cable. This data will be extrapolated in late autumn 2016 which will provide a set of initial data allowing an output to be produced from the model.

- 5.38 As more detail is gathered and established through the routine 8 year inspection cycle this extrapolated data will be replaced with more accurately recorded data.

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6 PLAN

6.1 In readiness for a new asset management system and to ensure CBRM's integrity, a programme was established in November 2015 to validate and cleanse asset data for the SSEPD businesses. A key output from one team is to review the asset data required to populate the RRP Volume (V1) tables for the two distribution companies and this work completed in July 2016 under the direction of ADP. Work has also commenced on validating the relevant asset types contained in the two asset registers used within SSEPD, namely PLACAR for non-linear assets (substation plant) and GIS for linear assets (cables and overhead lines).

Condition Assessment Review

6.2 As part of the process to introduce the CBRM methodology within SSEPD, a full assessment of the current data available and utilised within the business was carried out; see **Section 4** of this plan. Where asset data was available this was utilised to drive the necessary condition data inputs to the models. However, many additional data points were identified and an assessment of the benefits of this information being fed into the models was completed.

6.3 Where added value was identified, either for the immediate use in the CBRM models being designed or to provide the additional data required for the future enhancements to the system a review was carried out and work processes changed. This led to inspection and maintenance procedure changes within SSEPD and to commence additional data gathering. As mentioned previously in this plan, this has been further reviewed in relation to CNAIM. This work was prioritised against the effects on modelling where default criteria and parameters may be applied.

6.4 This has identified data in some areas where data needs to be collected to improve the accuracy of the CNAIM. The recommendations of this review have informed this IGP.

Asset Data Project Team

6.5 As mentioned above, the ADP team has reviewed validated and cleansed the asset data required to populate the CBRM system. The team consisted of data analysts, business subject matter experts and IT staff.

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6.6 In addition, the Asset Data Management team reviewed its processes for updating SSEPD’s asset registers. An external third party was contracted to provide an independent assurance review using its data quality expertise and knowledge for the validation and cleanse work and for the high level design of SSEPD’s proposed Work and Asset Management system.

Phases of work

6.7 The project team has analysed all available asset data information and is utilising existing maintenance and inspection staff to support the data validation process where site visits are required. SSEPD continues to be in close contact with Ofgem, informing them of the progress of the ADP and across all work-streams of SSEPD’s DPCR5 programme, providing regular updates on SSEPD’s findings and progress.

Figure 1: Data cleanse framework



6.8 The existing SSEPD data capture and reporting processes for populating SSEPD’s key asset data systems, PLACAR and GIS, have been audited. This has resulted in revised and improved processes introduced to ensure robust data processing is in place to maintain, enhance and provide consistency in the management of this data information going forward and throughout the duration of RIIO-ED1.

6.9 Additional processes have also been incorporated into this to reflect the additional requirements of the CNAIM data in line with the approach outlined in **Section 5** of this IGP.

6.10 A series of staff briefing sessions within the new regional structures were completed in early 2016. Staff now responsible for asset management including project delivery and asset maintenance and inspections, understand the critical importance of asset data accuracy and reporting requirements. This will support an enduring culture of continuous accurate asset management system maintenance within the new regional structures.

6.11 The SSEPD’s Data Assurance Manager is a member of the project steering group and has issued the team with a data assurance requirements document which explains what is required in terms of data assurance from the project.

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- 6.12 Following data validation / cleanse, members of the project team will then be responsible for the successful delivery of the asset management system as an integrated system to replace PLACAR and GIS for the SSEPD businesses.
- 6.13 It is currently intended to commence with the implementation of the asset management system replacement for the SSEPD's asset register(s) in the coming financial year 2016/17. Implementation would be undertaken through a number of releases, with the release to SEPD and SHEPD in the following year, 2017/18. In addition, it is proposed to upgrade the SSEPD's GIS system in the coming year as a key enabler for the Network integrated systems architecture.
- 6.14 The introduction of the new work and asset management system will produce some material change to the data being provided to CNAIM. During the design of the system, SSEPD plans to incorporate a number of procedural changes to facilitate recording of maintenance test results allowing SSEPD to further address some of the data points currently classified as category 6 in this IGP.
- 6.15 SSEPD does not anticipate any volume changes with the introduction of the new system. However, the impact of introducing test results will potentially drive a change in health indices to reflect the condition of these assets more accurately. When these changes are made and the data is introduced into the CNAIM models, SSEPD will assess the impact and document the changes and resulting impact on health indices in its annual submission.

Outcome of Phases of Work

- 6.16 As part of the Asset Data Project the following areas of work have commenced with the early items already completed. These support the integrity of CBRM and CNAIM with internal processes and form the main activity to address the requirements of this IGP:
- 6.16.1 An initial asset data review was completed in early December 2015 which has led to a prioritised plan for data validation and cleansing of assets to be identified for CBRM and CNAIM.
- 6.16.2 Data collection for non-linear assets, using existing maintenance and inspection teams, started in early December 2015. These provided checks on any non-matching data identified by the validation and cleanse exercise for non-linear assets associated with certain asset categories e.g. plant associated with primary substations.
- 6.16.3 Phase 2 of the data collection of linear and non-linear assets along with the final data validation and cleanse exercise was completed by 30 June 2016.

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6.17 With the adoption of the CBRM system by SSEPD, the further work being undertaken on the addition of CNAIM modelling data requirements and continuous improvement in Condition Assessment and Data Collection processes, SSEPD believes it has sufficiently justified its Network Asset Indices Methodology. This also demonstrates its ability to report on its Network Asset Secondary Deliverables. Although these works prepare SSEPD for RIIO-ED1's Network Asset Indices needs, SSEPD believes this to be the start of SSEPD's desire to continuously improve.

Timescales for data collections

6.18 The mechanisms for asset data collection and quality improvement noted above will address priority data collection and improvements. However, other aspects indicated as category 5 or 6 in **Attachment 1a and 1b** will take longer to complete where they do not merit the additional effort and cost associated with a special collecting regime.

6.19 On this basis, it should be noted that the required additional data collection will align with current maintenance and inspection policy and data will be collected during these periods, potentially 4 years for linear assets and 2 years for fixed assets, with the exception of the LV underground equipment which is on an 8 year period, as indicated in **Table 4** above.

6.20 Where a new policy or procedure is required these will be reviewed and assessed in due course. An example of this would be one of the 98 data points currently not proposed for collection, the thermographic assessment of HV Switchgear (GM) – Primary. If it were introduced under a revised policy, as has recently been for 132kV CBs, then it would be assessed for the introduction for EHV Switchgear (GM) and HV Switchgear (GM) – Distribution at the same time.

6.21 **Appendix 2** contains an example of SSEPD's data quality and percentage completion reporting tool which is being utilised to monitor the completeness of all the required CNAIM data points included in the data categories 1 to 6 referenced in **Attachment 1a and 1b**. SSEPD monitors and reports month on month the movement in completeness and have specific rules sets to monitor the required quality for data improvement.

6.22 Below each of the main asset category headers, the report can be opened up to see the specific data points and the current status as well as any differences in the values being received versus those required for the CNAIM agreed rule set. It should be noted percentages can decrease as new data point sets are added to the overall requirement.

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- 6.23 The development of this tool is now complete and this revised tool now covers all data points as defined in **Attachment 1a** categories 1 to 5 and therefore is a complete indicator including all CoF, PoF and information only data points.
- 6.24 SSEPD propose to provide regular quarterly updated reports to Ofgem using this tool to indicate progress with data completeness in line with this IGP over the remainder of the RIIO-ED1 period.
- 6.25 The finalised tool presents percentage completeness of data in a field to meet the CNAIM requirements and to ensure the minimum data necessary to produce a result from CNAIM is available and monitored.
- 6.26 In doing this it also carries out a minimum level quality check on the validity of the content of the actual data points; however the tool may be further developed once SSEPD identifies if there is any additional requirement to be monitored.

Review process

- 6.27 As noted above SSEPD is in regular contact with Ofgem to update it on progress across SSEPD's Data / DPCR5 Programme.
- 6.28 SSEPD's provision of progress reports and sharing of updated asset information will continue. SSEPD would propose to incorporate updates on the progress of this IGP as appropriate over the coming 6-9 months and then on an annual basis thereafter as part of the annual submission commentary to reflect where material differences are identified due to the completion of asset data collection in line with **Table 4** above.

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7 APPENDICES

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Appendix 1 – Data population project plan

ID	Model Ref	Asset Category	Inspection Frequency	Planned Completion Date	2016	2017	2018	2019	2020	2021	2022	2023	2024				
					Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	
1		Information Gathering Plan															
2		Asset Age Profile (Excl. Linkboxes)	n/a	December 2016													
3	CM1	LV OHL Support	4 Years	July 2021													
4	CM2	LV UG	8 Years	July 2024													
5	CM3	LV Switchgear and Other	Annually	December 2017													
6	CM4	HV OHL Support - Poles	4 Years	July 2021													
7	CM5	HV Switchgear (GM) - Primary	Quarterly	December 2017													
8	CM6	HV Distribution Switchgear	Annually	December 2017													
9	CM7	HV Distribution Transformers	Annually	December 2017													
10	CM8	EHV Poles	4 Years	July 2021													
11	CM9	EHV OHL Fittings	4 Years	July 2021													
12	CM10	EHV OHL Conductor (Tower Lines)	4 Years	July 2021													
13	CM11	EHV OHL Support - Towers	4 Years	July 2021													
14	CM12	EHV UG Cable (Gas)	Quarterly	December 2017													
15	CM13	EHV UG Cable (Non Pressurised)	Not Inspected	December 2017													
16	CM14	EHV UG Cable (Oil)	Quarterly	December 2017													
17	CM15	Submarine Cables	Annually	December 2017													
18	CM16	EHV Switchgear (GM)	Quarterly	December 2017													
19	CM17	EHV Transformers	Quarterly	December 2017													
20	CM18	132kV OHL Fittings	2 Yearly	July 2019													
21	CM19	132kV OHL Conductor (Tower Lines)	2 Yearly	July 2019													
22	CM20	132kV Tower	2 Yearly	July 2019													
23	CM21	132kV UG Cable (Gas)	Quarterly	December 2017													
24	CM22	132kV UG Cable (Non Pressurised)	Not Inspected	December 2017													
25	CM23	132kV UG Cable (Oil)	Quarterly	December 2017													
26	CM24	132kV Circuit Breakers	Quarterly	December 2017													
27	CM25	132kV Transformer	Quarterly	December 2017													

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Appendix 2 – Data collection and improvement tracker

As part of SSEPD’s monthly review and progress tracker it will review the data point completeness for all data points associated with the requirements of CNAIM.

Table 5 below shows an example of how the high level asset categories can be cross referenced to the previous review period to monitor progress. As SSEPD adds more data points to the collection system there may be an indicated reduction in percentage completeness until these new data points are populated.

Table 5: Example data point monitor summary report

CBRM – Asset Category	Completeness % of Checks	
	Example week 1	Example week 2
11kV Primary S/S CB	72.7%	64.6%
132kV CBs South	73.6%	61.5%
132kV Transformers South	88.1%	85.7%
Circuit	51.2%	37.1%
EHV Circuit Breakers	40.8%	33.6%
EHV Poles	66.5%	65.8%
EHV Solid Cable	5.5%	23.2%
EHV Transformer	72.5%	73.2%
Fluid Filled Cable	56.6%	59.7%
Gas Filled Cable	59.0%	60.2%
HV Poles	64.1%	60.9%
HV Switchgear	60.7%	55.2%
HV Transformer	77.0%	76.2%
LV Poles	54.5%	56.2%
LV Switchgear	85.7%	84.9%
Steel Towers	50.4%	57.9%
Submarine Cable	73.6%	73.6%

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Table 6 illustrates the level of granularity available in the data monitoring tool for each data point. The example shown is for HV Transformer (GM) in SHEPD licence area.

Table 6: Data point monitor – hierarchy for CNAIM only fields

CBRM – Asset Category	Completeness % of Checks example week 2
HV Transformer	76.2%
HV_TX_Adhoc	66.7%
HV_TX_Adhoc_Site	0.0%
HV_TX_Condition	100.0%
HV_TX_Defects	100.0%
HV_TX_Interventions	0.0%
HV_TX_North	81.2%
Asset Category	100.0%
Situation	98.8%
Plant Code	100.0%
Serial No	99.9%
Substation code	99.8%
Year of Manufacture	99.3%
Transformer ID	100.0%
Primary Voltage	100.0%
Rating	99.7%
Transformer Name	99.6%
MDI Blue Phase	92.3%
MDI Multiplier	88.2%
MDI Red Phase	92.3%
MDI Yellow Phase	92.3%
Reliability Collar	0.0%
Reliability Factor	0.0%
KVA Band Per Customer	0.0%
HV_TX_Site	67.4%
HV_TX_SOP	0.0%
HV_TX_South	80.2%
HV_TX_Tests	100.0%

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Appendix 3 – Licence condition requirements for IGP

The requirement of the Common Network Asset Indices Methodology (CNAIM) is stated under Standard Licence Condition 51.12 to 51.16 as detailed in the extract below.

Condition 51. Network Asset Indices Methodology

Part E: Information Gathering Plan

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.

51.13 The licensee may apply to the Authority for a derogation from the requirements of paragraph 51.12 if it considers that it already collects sufficient information in respect of its own Network Asset Indices Methodology to allow implementation 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.

51.15 The Authority, after reviewing the Information Gathering Plan submitted to it, and having consulted the licensee and any other interested parties that the Authority considers it appropriate to consult, may:

- (a) approve the plan without modification if satisfied that it will enable the licensee to report accurately on its progress against its Network Asset Secondary Deliverables; or*
- (b) direct the licensee to modify the Information Gathering Plan, in such manner, to such extent, and with effect from such date as may be specified in the direction, so that it will, in the Authority’s opinion, having considered any representations received, enable the licensee to so report.*

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.

This requirement to submit an Information Gathering Plan (IGP) commenced on 1 February 2016 following the issue of direction from Ofgem for a submission within a 12 week period. The original document was submitted on 25 April 2016.