Network Output Measures Health & Risk Reporting Methodology

IMPLEMENTATION PLAN PART 2

NATIONAL GRID GAS NETWORKS' DATA GATHERING AND INITIATIVE PLANS

Version *<1.0>*
<28/09/2015>

VERSION HISTORY

Version #	Implemented By	Revision Date	Approved By	Approval Date	Reason
1.0	D. Hunter	27/9/15	J. Madden	30/9/15	Final

Table of Contents

1 Part 2 – Network Deliverables

1.1 Overview

The NOMs Methodology, requires each individual GDN to provide input values that are reflective of their failure rates, asset deterioration (where failure data can demonstrate significant variance), and maintenance and intervention costs. This will ensure that the Monetised Risk value is reflective of the network assets and current maintenance regimes of each individual GDN. The GDN specific values will be defined within the Global Values table and each of the Data Reference Libraries applicable to individual Event Tree risk map.

Each GDN will be responsible for the capture and alignment of available data from their core systems to the format of the base data tables required to run the risk model. This will be completed as part of the implementation of the models for RRP reporting in July 2016 and further data refreshes will be completed on a material basis as detailed in section 6 of the methodology document.

Where there is insufficient data the criteria outlined in section 4.2 of the methodology document will be applied to identify whether pooled data is required. If this is the case then this data item would be considered to be a Global Value and would be managed and reviewed by the SRWG.

1.2 Performance Monitoring – All GDNs

The performance of implementing the risk models will be completed against the specific asset data reference libraries produced during the development of the individual risk models. GDNs will chart their data gaps and quality issues against each nodal value that is specific to the individual GDNs i.e. Probability of Failure (PoF), Probability of Consequence (PoC), internal financial costs.

Currently our data for mains and services is robust, however the data improvements outlined within this document will mainly involve data analysis to ensure consistent alignment of our terminology, definitions and allocation methods ensuring that the asset information can be applied correctly within the event tree risk models ensuring consistent outputs reported within RRP table 7.3.

The future data improvements or data gathering initiatives outlined within this document will be updated and communicated to Ofgem through an Annual Report. This will include updates covering:

- The current status of asset data applicable to the derivation of Monetised Risk
- The forecasted timescales for the completion of the Information Gathering Plan

The review process will take into account those factors where it is appropriate to make them consistent across all GDNs and additionally, GDN specific factors to be employed within the methodology (e.g. deterioration factors, Information Gathering Plans). Each nodal value will be set at an initial value for the GD1 period and will be updated depending on its materiality to the monetised risk value.

This review process will ensure that:

- Monetised Risk and the associated nodal value drivers are monitored and reviewed on a frequency dependant on materiality as defined in section 6 of the methodology document to verify that assumptions about the derived Monetised Risk remain valid
- Assumptions on which the risk assessment is based, including the external and internal context, remain valid
- Event Tree assessment techniques are being properly applied through a consistent application of the processes outlined within the "Network Output Measures Health & Risk Reporting Methodology & Framework" document
- Validation of results on Asset Health, Criticality and Monetised Risk outputs against expected values
- Innovation interventions are being correctly modelled

1.3 Gap Analysis (Distribution Mains) – National Grid (National Grid)

As per the NOMs Methodology Data Assessment section (4.2), the Mains Risk Map is accompanied with details of global values applied (see section 3.6.2 of NOMs Methodology) and a Data Reference Library (see section A2.5 of NOMs Methodology). The Data Reference Library details the inputs required. Gap analysis of National Grid data quality levels against these data reference libraries will ensure that National Grid work towards having the required asset, fault and financial data structure to enable consistent annual reporting of asset risk, health and criticality.

The risk map for Distribution Mains has been finalised and the specific data requirements are documented within the Mains Data Reference Library. In order to understand National Grid's current asset data position, a gap analysis has been completed to ensure that National Grid is able to meet the NOMs reporting requirements. This analysis is split into 2 main areas:

- Core Asset Data
- Top 6 Risk Drivers

1.3.1 Distribution Mains – Core Asset Data

Gap analysis has been undertaken for asset data that will be used in the determination of PoF values along with financial data for each anticipated asset cohort. These include:

- Location
- Diameter
- Length
- Material
- Failures

There are four key data categories that will impact the development and implementation of the risk model and these are (see Appendix A for description):

1. Asset Functional location data
2. Asset Health data
3. Failure data
4. Financial data

The tables on the following pages provides details on our current data gaps against these data areas that will be utilised for the production and future modification of the Event Tree Risk Maps developed under the NOMs methodology and states a timeframe for completion of data capture.

Where data quality levels are amber or green, data is of sufficient quality/quality to enable the consistent application of the methodology. Red indicates a significant gap which would prevent the application of the methodology

	Key: Red: Significant Gap Amber: Data gap - Assumptions Applied Green: Complete / Consistent	**Key: Red: End of RIIO GD1 Amber – Mid Point Green – July 2016**	
Data Type	**Data Quality Level**	**Indicative Delivery**	**Comment**
Asset Functional location data	Green	Green	Comparative data set
Asset health data	Green	Amber	Minor data issues in terms of quality of communication process with our delivery partners
Failure data	Green	Green	Strong failure capture processes.
Financial data	Green	Green	Good data available, further review and realignment required ensuring that current financial and asset allocation methodologies are appropriate.

Table 1 – Mains Core Asset Data Quality Position

1.3.2 Distribution Mains - Top 6 Risk Drivers

The current model was developed utilising Northern Gas Networks data, although a refresh and validation of this data is required for reporting in 2016, it is expected that there is unlikely to be a significant deviation to the mains cost drivers identified.

The approach is to look at the main 6 cost drivers, defined below, and provide a risk status for current data quality for each nodal value along each of the 6 branches on the risk map.

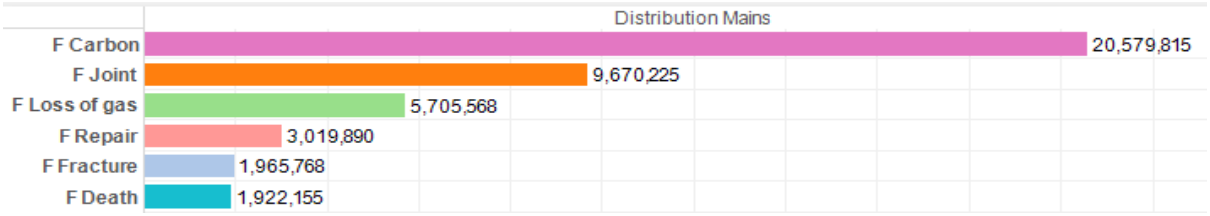

Fig 1. Top 6 Monetised Risk Drivers – Distribution Mains

Associated nodes for Mains	
F Carbon – Driver 1	**F Repair – Driver 4**
General Emissions	Corrosion Failure
Joint Failure	Interference Failure
Interference Failure	**F Fracture – Driver 5**
Corrosion Failure	Fracture Failure
Fracture Failure	**F Death – Driver 6**
F Joint – Driver 2	Corrosion Failure
Joint Failure	Death Major
F Loss of gas – Driver 3	Explosion
Corrosion Failure	Fracture Failure
Fracture Failure	Gas Escape
Gas Escape	Gas Ingress
General Emissions	Interference Failure
Interference Failure	Joint Failure
Joint Failure	
Loss of gas	

Table 2. Associated Nodes – Distribution Mains

Following the data gap analysis of the Distribution Mains risk models, table 3 has been populated detailing National Grid's current asset data position for each of the nodal values that form part of the calculation of the top 6 Monetised Risk drivers:

	Key: **Red: Significant Gap** **Amber: Data gap - Assumptions Applied** **Green: Complete / Consistent**	**Key:** **Red: End of RIIO GD1** **Amber – Mid Point** **Green – July 2016**	
Nodal for top 6 risk drivers	**Data Quality Level**	**Indicative Delivery**	**Comment**
Corrosion Failure	Green	Green	Comparative data set
Fracture Failure	Green	Green	Comparative data set

	Key: Red: Significant Gap Amber: Data gap - Assumptions Applied Green: Complete / Consistent	Key: Red: End of RIIO GD1 Amber – Mid Point Green – July 2016	
Nodal for top 6 risk drivers	**Data Quality Level**	**Indicative Delivery**	**Comment**
General Emissions	Green	Green	Comparative data set, leakage model currently under review
Interference Failure	Green	Green	Comparative data set
F Joint Failure	Green	Green	Comparative data set, however further cost analysis / improved cost structure of financial models required
Joint Failure	Green	Green	Comparative data set
F Repair	Green	Green	Comparative data set, however further cost analysis / improved cost structure of financial models required
F Fracture	Amber	Amber	Improved cost structure of financial models required
F Loss of Gas	Green	Green	Comparative data set
Loss of gas	Green	Green	Derived for industry study – Ofgem approved industry model utilised ensuring consistency
Capacity	Amber	Amber	Specific capacity issues not fully understood as reactive remediation activity. Improved LP network modelling
Supply Interruptions	Green	Green	Supply interruptions events capture but are of low frequency leading to low granularity of root cause analysis.
GIB_Joint	Amber	Green	Comparative data set, but some inconsistent terminology understanding
GIB_Interferance	Amber	Green	Comparative data set, but some inconsistent terminology understanding
GIB_Corrosion	Amber	Green	Comparative data set, but some inconsistent terminology understanding
GIB_Fracture	Amber	Green	Comparative data set, but some inconsistent terminology understanding

Table 3 – Mains Nodal Value Data Quality Position

1.4 Data Improvement Initiative (Mains)

National Grid's core Distribution Mains asset data, both within SAP and GIS, is robust and of good quality, with well-established processes as part of the ongoing REPEX programme. Further improvements have been progressed, such as the use of Measurement Technicians to ensure data accuracy and the move to enable the capture of field data electronically.

Ongoing areas for data improvements within our current data strategy for mains and services will improve on the communication with our delivery partners to ensure that data is received in a timely manner and is of the appropriate quality.

Additionally there is an ongoing data assurance process to identify issues relating to data assurance and consistency between our core systems (SAP and ESRI). This strategy will ensure continuous improvement of the end to end process of data provisioning and assurance from our IS departments and delivery partners.

Financial alignment to this data strategy will progress to allow further improvements in the reporting accuracy of a monetised risk value. These strategies will ensure that National Grid core data is consistent collected and recorded throughout the year reducing the RRP data validation requirements completed at the end of the financial year for RRP reporting.

1.5 Implementation of Reporting (Mains)

Following the completion of the gas analysis, further processes are being developed to ensure Distribution Mains RRP is completed for July 2016 for table 7.3 "Asset Health and Criticality Data". All of the model's data variables and parameters required have been mapped against data sources. Where a full dry-run of the model isn't possible in the timeframe, a high-level validation exercise will be undertaken to ensure the table 7.3 RRP process (data collection) can commence soon after 15/16 year-end. Please note: Data collection and analysis is dependent on data capture post-March 2015 and completion of other RRP tables.

The following tasks will be completed (timescales are indicative):

Data Process & Collection – Oct 2015 to May 2016
Finalisation of Mains and Services Excel Risk Model
Training of appropriate personnel
Data collection from defined sources & validation

Data Analysis – Mar to Jul 2016
Perform data calculations
Population of risk model base data table
Population of intervention plans
Run Mains & Services Risk Model
Model validation incl. comparison of scenarios to business plan
Populate 2015/16 RRP
Re-state 2013, 2017 and 2021 with-without intervention

Review – Aug to Nov 2016
Review population process and capture lessons learnt.
Review and update Implementation Plan.

1.6 Gap Analysis (Services) – National Grid

As per the NOMs Methodology Data Assessment section (4.2), the Service Risk Map is accompanied with details of global values applied (see section 3.6.2 of NOMs Methodology) and a data Rreference Library (see section B2.5 of NOMs Methodology). The data reference Library details the inputs required. Gap analysis of National Grid's data quality levels against these data reference libraries will ensure that National Grid work towards having the required asset, fault and financial data structure to enable consistent annual reporting of asset risk, health and criticality.

The risk map for Services has been finalised and the specific data requirements are documented within the Services Data Reference Library. In order to understand National Grid's current asset data position, a gap analysis has been completed to ensure that National Grid is able to meet the NOMs reporting requirements. This analysis is split into 2 main areas:

- Core Asset Data
- Top 6 Risk Drivers

1.6.1 Services - Core Asset Data

Gap analysis has been undertaken for asset data that will be used in the determination of PoF values along with financial data for each anticipated asset cohort. These include:

- Location
- Diameter
- Material
- Failures
- Criticality/Customer

There are four key data categories that will impact the development and implementation of the risk model and these are (see Appendix A for description):

5. Asset Functional location data
6. Asset Health data
7. Failure data
8. Financial data

The tables on the following pages provides details on our current data gaps against these data areas that will be utilised for the production and future modification of the Event Tree Risk Maps developed under the NOMs methodology and states a timeframe for completion of data capture.

Where data Assessment levels are amber or green, data is of sufficient quality/quality to enable the consistent application of the methodology. Red indicates a significant gap which would prevent the application of the methodology.

	Key: Red: Significant Gap Amber: Data gap - Assumptions Applied Green: Complete / Consistent	Key: Red: End of RIIO GD1 Amber – Mid Point Green – July 2016	
Data Type	**Data Quality Level**	**Indicative Delivery**	**Comment**
Asset Functional location data	Amber	Amber	Application of the previous accepted service asset data within the national leakage model. As National Grid Repex programme progresses, and as services are replaced, or transferred, new asset data is being captured within core systems.
Asset health data	N/A	N/A	Asset Health is inferred by the failure data
Failure data	Amber	Green	Robust Data, some further data analysis required to align with risk model
Financial data	Amber	Amber	Cost allocation improvements required. Data recording processes altered to align with risk model requirements. Further data analysis to understand if cost allocation improvements can be implemented for <63mm services.

Table 4 – Services Core Asset Data Quality Position

1.6.2 Services - Top 6 Risk Drivers

The current model was developed utilising National Gas Networks data, although a refresh and validation of this data is required for reporting in 2016, it is expected that there is unlikely to be a significant deviation to the mains cost drivers identified.

The approach is to look at the main 6 cost drivers, defined below, and provide a risk status for current data quality for each nodal value along each of the 6 branches on the risk map.

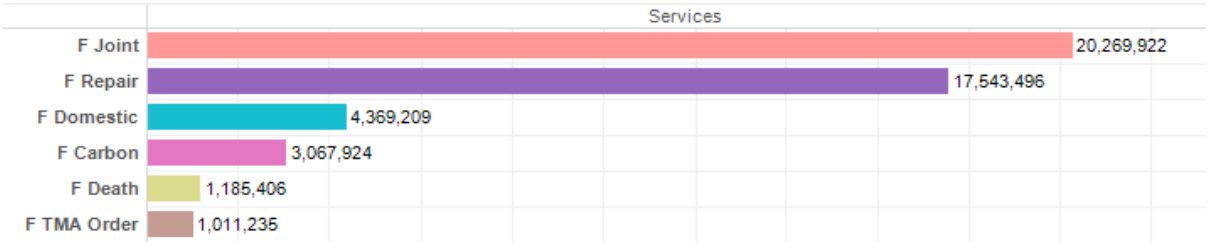

Fig 2. Top 6 Monetised Risk Drivers – Services

Associated nodes for Services	
F Joint – Driver 1	**F Carbon – Driver 4**
Joint Failure	General Emissions
F Repair – Driver 2	Joint Failure
Corrosion Failure	Interference Failure
Interference Failure	Corrosion Failure
F Domestic – Driver 3	Fracture Failure
Joint Failure	**F Death – Driver 5**
Interference Failure	Joint Failure
Corrosion Failure	Interference Failure
Fracture Failure	Corrosion Failure
Capacity	Fracture Failure
Gas Escape	GIB_Joint
Supply interruptions	GIB_Interferance
Props Domestic	GIB_Corrosion
	GIB_Fracture

Table 5. Associated Nodes – Services

Following the data gap analysis of the Services risk models, table 6 has been populated detailing NG's current asset data position for each of the nodal values that form part of the calculation of the top 6 Monetised Risk drivers:

	Key: **Red: Significant Gap** **Amber: Data gap - Assumptions Applied** **Green: Complete / Consistent**	**Key:** **Red: End of RIIO GD1** **Amber – Mid Point** **Green – July 2016**	
Nodal for top 6 risk drivers	**Data Quality Level**	**Indicative Delivery**	**Comment**
Corrosion Failure	Amber	Green	Review of data collection required
Fracture Failure	Green	Green	Comparative data set – but low numbers of failure
General Emissions	Green	Green	Comparative data set
Interference Failure	Green	Green	Comparative data set
F Joint Failure	Amber	Green	Restricted historical data set, improved cost structure or further cost analysis of financial models required
Joint Failure	Amber	Green	Restricted historical data set

	Key: Red: Significant Gap Amber: Data gap - Assumptions Applied Green: Complete / Consistent	Key: Red: End of RIIO GD1 Amber – Mid Point Green – July 2016	
Nodal for top 6 risk drivers	**Data Quality Level**	**Indicative Delivery**	**Comment**
F Repair	Amber	Green	Restricted historical data set, improved cost structure in financial models required
F Fracture	Amber	Green	Restricted historical data set, improved cost structure in financial models required
F Loss of Gas	Green	Green	Comparative data set
Loss of gas	Amber	Green	Data set inconsistent through networks – future alignment required through system change
Capacity	Amber	Amber	Data set inconsistent through networks – future alignment required through substantial system changes
Supply Interruptions	Green	Green	Comparative data set
GIB_Joint	Amber	Green	Comparative data set , however further improvements required to link to mains and service records and apply to model at a granular level
GIB_Interferance	Amber	Green	Comparative data set , however further improvements required to link to mains and service records and apply to model at a granular level
GIB_Corrosion	Amber	Green	Comparative data set , however further improvements required to link to mains and service records and apply to model at a granular level
GIB_Fracture	Amber	Green	Comparative data set , however further improvements required to link to mains and service records and apply to model at a granular level

Table 6 –Services Nodal Value Data Quality Position (including GDN-Specific Global Values)

1.7 Data Improvement Initiative (Services)

Currently National Grid have c10.9 million services with no individual asset records for services <63mm recorded in SAP or ESRI. As National Grid Repex programme progresses, and as services are replaced, or transferred, new asset data is being captured within core systems.

Future data initiatives will involve the improvement of service records and are reflective of the actual services associated to the parent main.

National Grid is currently undertaking predictive analytics studies to support the proactive replacement of services before they fail (hotspot analysis). The outputs from this may enable data improvements in the PoF and deterioration calculations within the risk model.

GDNs will continue to review potential data sources and systems will continue to improve the allocation methodology and for that utilised within the appendices of the Network Output Measures Health & Risk Reporting Methodology & Framework document

1.8 Implementation of Reporting (Services)

Following the completion of the gas analysis, further processes are being developed to ensure RRP reporting of services in table 7.3 is completed for July 2016. All of the model's data variables and parameters required have been mapped against data sources. Where a full dry-run of the model isn't possible in the timeframe, a high-level validation exercise will be undertaken to ensure the RRP process (data collection) can commence soon after 15/16 year-end. Please note: Data collection and analysis is dependent on data capture post-March 2015 and completion of other RRP tables.

The following tasks will be completed (timescales are indicative):

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Model validation incl. comparison of scenarios to business plan
Populate 2015/16 RRP table 7.3
Re-state 2013, 2017 and 2021 with-without intervention

Review – Aug to Nov 2016
Review population process and capture lessons learnt.
Review and update Implementation Plan.

1.9 Other Asset Groups

Gap analysis will be undertaken as and when Event Trees are developed, in line with the primary assets identified within Table 1 of the Implementation Plan Part 1.

When initial Event Trees are drafted, an interim analysis is undertaken to ensure that the Event Tree is fit for purpose and that current and future data requirements can be, or will be, met.

When Event Trees are finalised and approved, a full analysis is undertaken to identify data sources, data gaps, processes and the data improvements required to enable the use of this methodology for Regulatory Reporting in 2016 and beyond.

The completed Gap Analysis for each Asset Group will be published and updated within the body of this document (Implementation Plan – Part 2).

APPENDIX A: KEY TERMS

The following table provides definitions and explanations for terms and acronyms relevant to the content presented within this document.

Term	Definition
Asset Functional location data	This is the asset base data of individual asset records from the core SAP system and may include the following attributes: • Asset classifications • Asset ID's • Asset Location • Asset operational status • Asset Configuration
Asset Health data	This includes all asset health related data such as, but not limited to: • Asset design specification • Asset Age • Observed Condition • Duty • Capacity • Location & Environmental health factors
Failure data	This includes all functional failure data collected through the core system and the PSSR fault recording process
Financial data	This includes all financial data held in the core systems that will be utilised within the risk models