Network Output Measures

Health and Risk Reporting Methodology Implementation Plan Part 2

SGN Data Gathering and Initiative Plans

Version 1.0
30th September 2015

SGN
Your gas. Our network.

Version History

Version	Author	Revision date	Approver	Approval date	Reason
1.0	Gary Kitching	30/09/15	Stephen Skipp	30/09/15	First draft

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. SGN specific values will be defined within the Global Values table and each of the data reference libraries applicable to individual Event Tree risk maps.

SGN is responsible for the capture and alignment of available data from our core systems to the format of the base data tables required to run the risk model.

1.2 Performance Monitoring – All GDNs

Implementation of the risk models requires the full population of the specific asset data reference libraries produced during the development of the methodology. Any gaps in data must be closed via appropriate data gathering plans. SGN will chart any data gaps and quality issues against each nodal value that is specific to our networks i.e. Probability of Failure (PoF), Probability of Consequence (PoC), internal financial costs.

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 Implementation Plan

The review process will take into account those factors where it is appropriate to make them consistent across all GDNs and additionally, SGN specific factors to be employed within the methodology (e.g. deterioration factors, Information Gathering Plans).

This review process will ensure that:

- Monetised Risk and the associated nodal value drivers are monitored and reviewed on a regular basis 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 Analysis 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 and Monetised Risk outputs against expected values
- Innovation interventions are being correctly modelled.

2 Gap Analysis (Distribution Mains)

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 SGN’s data quality levels against these data reference libraries will ensure that SGN will be able to collate 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 SGN's current asset data position, a gap analysis has been completed to ensure that SGN are able to meet the NOMs reporting requirements. This analysis is split into two main areas:

- Core Asset Data
- 'Top six' Risk Drivers

2.1 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 of our assessment of the 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 the Data Assessment Levels are amber or green, data is of sufficient quantity/quality to enable the consistent application of the methodology. Red indicates a significant gap which would prevent the application of the methodology.

The key for these assessments are as follows:

Data assessment level	Complete / consistent	Data gap – assumptions applied	Significant gap
Indicative delivery Data gathered by:	First reporting – July 2016	Mid point of GD1	End of GD1

Data Type	Data Assessment Level	Indicative Delivery	Comment
Asset Functional location data		N/A	Data is complete and consistent with all GDNs. Data is available via Maximo, GIS.
Asset health data		N/A	Data is complete and consistent with all GDNs. Data is available via Maximo, MRPS and Synergee Gas

Data Type	Data Assessment Level	Indicative Delivery	Comment
Failure data		N/A	Failure data, including causal effect, is captured via Maximo. PoF can be calculated by analysis of PON length.
Financial data			Unit costs for specific types of repairs are not currently captured and therefore not attributable to specific Failure Modes. Short term estimates will be supported by further analysis and data capture.

Table 1 – Core Mains asset data

2.2 Distribution Mains - Top 6 Risk Drivers

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.

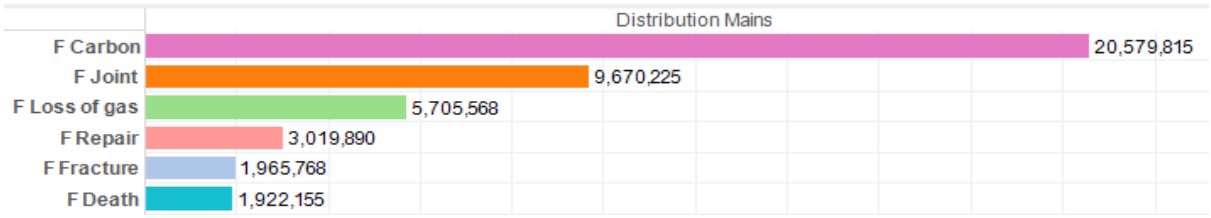

Fig 1. Top 6 Monetised Risk Drivers – Distribution Mains

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

	Joint Failure

Table 2. Associated Nodes – Distribution Mains

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

Nodal value	Data Assessment Level	Indicative Delivery	Comment
Corrosion Failure		N/A	Data captured from field systems and transferred into Maximo.
Fracture Failure		N/A	Data captured from field systems and transferred into Maximo. Failure rates are validated for use within MRPS
General Emissions		N/A	Data captured as part of LRMM and the associated assurance and governance processes
Interference Failure		N/A	Data captured from field systems and transferred into Maximo.
Joint Failure		N/A	Data captured from field systems and transferred into Maximo.
F Joint Failure (£)			Unit costs for a generic repair is captured, is available via BORIS and may be analysed by mains PON (material, diameter) Unit costs for specific types of repairs (i.e. by causal effect) are not currently captured and therefore not attributable to specific Failure Modes. Short term estimates will be supported by further analysis and data capture.
F Repair (£)			
F Fracture (£)			
F Loss of Gas (£)		N/A	Data captured as part of LRMM and the associated assurance and governance processes. Also published values for 'cost of carbon'
Loss of gas		N/A	
Capacity		N/A	'Capacity' derived from industry accepted network analysis model, Synergee Gas, which is regularly validated in accordance management procedures
Supply Interruptions		N/A	Data captured and is currently reported in accordance with RIIO Output

Nodal value	Data Assessment Level	Indicative Delivery	Comment
GIB_Joint		N/A	Data is captured and is currently reported to the industry's safety regulator
GIB_Interference		N/A	
GIB_Corrosion		N/A	
GIB_Fracture		N/A	

Table 3 – Mains and Services Nodal Value Data Quality Position

2.3 Data Improvement Initiative (Mains)

SGN is currently undertaking a number of detailed analyses of mains failure rates using Predictive Analytics techniques in order to develop our understanding of overall failure rates and possible causal effects. This work may allow the determination of deterioration rates with a greater degree of certainty.

SGN will undertake further analysis of the financial cost of repairs to improve the quality of our estimates for the cost of repair of fractures leaking joints and corrosion. It is anticipated that this work will be complete by the mid-point of GD1. However, it does not prevent initial reporting using generic costs for mains failure.

2.4 Implementation of Reporting (Mains)

Following the completion of the initial analysis, further processes are being developed to ensure the RRP submission for Monetised Risk for Distribution Mains 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 prior to submission of the methodology in September 2015, 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 2016 and completion of other RRP tables.*

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

Data Process & Collection – *October 2015 to May 2016*

- Finalisation of Mains and Services Excel Risk Model
- Training of appropriate personnel
- Data collection from defined sources & validation

Data Analysis – *March to July 2016*

- Perform data calculations
- Population of risk model base data table
- Population of intervention plans
- Run Mains 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 – *August to November 2016*

- Review population process and capture lessons learnt.
- Review and update Implementation Plan.

3 Gap Analysis (Services)

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 Reference Library (see section B2.5 of NOMs Methodology). The Data Reference Library details the inputs required. Gap analysis of SGN's data quality levels against these data reference libraries will ensure that SGN will be able to collate 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 SGN's current asset data position, a gap analyses have been completed to ensure that SGN is able to meet the NOMs reporting requirements. These analyses are split into two main areas:

- Core Asset Data
- 'Top six' Risk Drivers

3.1 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):

- Asset Functional location data
- Asset Health data
- Failure data
- 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 the Data Assessment Levels are amber or green, data is of sufficient quantity/quality to enable the consistent application of the methodology. Red indicates a significant gap which would prevent the application of the methodology.

Data Type	Data Assessment Level	Indicative Delivery	Comment
Asset Functional location data			Location data is available within the asset repository, Maximo.
Asset health data			Further analysis is required to identify the material for services where the asset record is incomplete.
Failure data		N/A	Data is recorded via field systems and transferred into Maximo.
Financial data			Unit costs for specific types of repairs are not currently captured and therefore not attributable to specific Failure Modes. Short term estimates will be supported by further analysis and data capture.

Table 4 – Core Services asset data

3.2 Services - Top 6 Risk Drivers

The approach is to look at the main six 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.

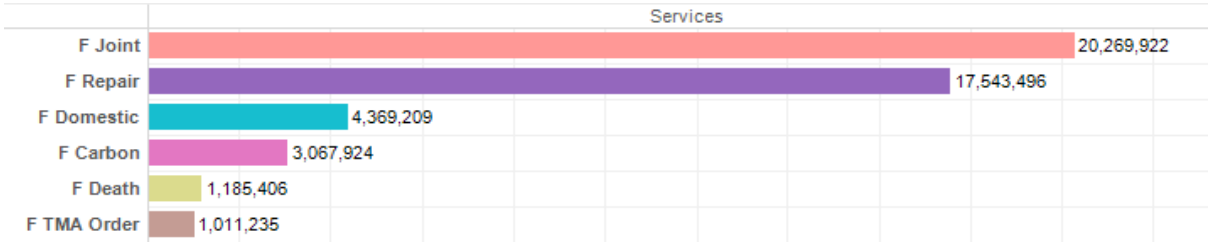

Fig 2. Top 6 Monetised Risk Drivers – Services

Associated nodes for Services	
F Joint – Driver 1	Joint Failure
F Repair – Driver 2	Corrosion Failure
	Interference Failure
F Domestic – Driver 3	Joint Failure
	Interference Failure
	Corrosion Failure
	Fracture Failure
	Capacity
	Gas Escape
	Supply interruptions
	Props Domestic
F Carbon – Driver 4	General Emissions
	Joint Failure
	Interference Failure

	Corrosion Failure
	Fracture Failure
F Death – Driver 5	Joint Failure
	Interference Failure
	Corrosion Failure
	Fracture Failure
	GIB_Joint
	GIB_Interferance
	GIB_Corrosion
	GIB_Fracture

Table 5 - Associated Nodes – Services

Following the data gap analysis of the Services risk models, table 4, has been populated detailing SGN's current asset data position for each of the nodal values that form part of the calculation of the top 6 Monetised Risk drivers:

Nodal for top 6 risk drivers	Data Assessment Level	Indicative Delivery	Comment
Corrosion Failure		N/A	Data captured from field systems and transferred into Maximo.
Fracture Failure		N/A	Data captured from field systems and transferred into Maximo. Failure rates are validated for use within MRPS
General Emissions		N/A	Data captured as part of LRMM and the associated assurance and governance processes
Interference Failure		N/A	Data captured from field systems and transferred into Maximo.
Joint Failure		N/A	Data captured from field systems and transferred into Maximo.
F Joint Failure (£)			Unit costs for a generic repair is captured, is available via BORIS and may be analysed by mains PON (material, diameter) Unit costs for specific types of repairs (i.e. by causal effect) are not currently captured and therefore not attributable to specific Failure Modes. Short term estimates will be supported by further analysis and data capture.
F Repair (£)			
F Fracture (£)			
F Loss of Gas (£)		N/A	Data captured as part of LRMM and the associated assurance and governance processes. Also published values for 'cost of carbon'
Loss of gas		N/A	

Nodal for top 6 risk drivers	Data Assessment Level	Indicative Delivery	Comment
Capacity		N/A	'Capacity' details derviced from statistics for 'poor pressure' and other diagnostic events.
Supply Interruptions		N/A	Data captured and is currently reported in accordance with RIIO Output
GIB_Joint		N/A	Data is captured and is currently reported to the industry's safety regulator
GIB_Interferance		N/A	
GIB_Corrosion		N/A	
GIB_Fracture		N/A	

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

3.3 Data Improvement Initiatives (Services)

Further work is required to predict the material for services where that information was not transferred or captured in legacy systems.

Further analysis is required to identify the cost of repair for specific Failure Modes. In the meantime, reporting will be on the basis of available financial data.

SGN continues to undertake the innovative analysis of service failures to identify 'hot spots' down to second generation postcode level (i.e. BR5 2xx).. In doing so, this may support an improvement in the quality of reporting against PoF.

3.4 Implementation of Reporting (Services)

Following the completion of the initial analysis, further processes are being developed to ensure the RRP submission for Monetised Risk for Services 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 prior to submission of the methodology in September 2015, 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 2016 and completion of other RRP tables.*

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

Data Process & Collection – *October 2015 to May 2016*

- Finalisation of Mains and Services Excel Risk Model
- Training of appropriate personnel
- Data collection from defined sources & validation

Data Analysis – *March to July 2016*

- Perform data calculations
- Population of risk model base data table
- Population of intervention plans
- Run Services Risk Model
- Model validation incl. comparison of scenarios to business plan
- Populate 2015/16 RRP
- Re-state 2013 and 2021 with-without intervention

Review – *August to November 2016*

- Review population process and capture lessons learnt.
- Review and update Implementation Plan.

4 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 IDs • 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