NIA Project Registration and PEA Document

Date of Submission

Dec 2015

Project Reference Number

NIA_NGGD0068

Project Registration

Project Title

Network Outperformance Measure Risk Trading Methodology Stage 2

Project Reference Number

NIA_NGGD0068

Project Licensee(s)

Cadent

Project Start

December 2015

Project Duration

1 year and 4 months

Nominated Project Contact(s)

NGGD Project Manager – John Madden – Lead network, NGN Project Manager – Steve O'Connor, WWU Project Manager – Ian Dunstan, SGN Project Manager – Oliver Machan, SGN Technical Lead – Stephen Skipp

Project Budget

£406,287.00

Summary

The purpose of the project is to provide a new methodology for delivering the requirements for Ofgem reporting. The collaborative working across the GDNs will provide a consistent benchmark for reporting a complex solution in a pragmatic way. DNV GL and ICS will be looking to determine pioneering research into failure modes, probability of failure and consequence analysis using both GDN supplied failure, investment data and industrially published data to facilitate the development of the following Event Tree models:

- Offtake / PRS Regulator and Slamshut systems

- Offtake / PRS Filters Systems

- Offtake Odorisation Systems

- Offtake Metering Systems

- Risers

Ofgem's ambition is that all asset groups should be modelled at an asset level. A key part of the design phase will be to determine the optimum level of detail required for each Asset Group benefit/cost analysis is based current GDN data holdings and the cost/time needed for implementation.

It is recognised that GDNs may hold data at different levels of detail, but a consistent level of detail required for each Event Tree will be agreed by the SRWG. In principle analysis will be built up from asset-level data, where available, but the detail of reporting and analysis may be at an aggregated or population level.

Nominated Contact Email Address(es)

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Problem Being Solved

Following submission of the Gas Distribution Network's (GDN's) business plans, Ofgem recognised the significant work carried out by the GDNs to report asset health, probability of failure and deterioration.

However, it was recognised that the proposed framework did not provide consistent results between the GDNs and did not enable risk trading i.e. risk justification for the transfer of investment across asset groups.

Ofgem have an expectation that outputs are not only useful for comparing overall investment, in terms

of the change in risk value generated by investment-driven changes to overall asset populations (the

Asset Group or Sub-group), but to enable GDNs to target investment on specific assets based on the optimum risk reduction value.

As it was communicated that Ofgem were not satisfied with the proposal on the assessment of Asset Health and Criticality the GDNs prepared an alternative methodology for asset risk reporting and trading based on an Event Tree analysis approach. This approach will enable the benefits of expenditure across different gas distribution asset groups to be articulated on a consistent basis, compared and traded off.

Ofgem has provided initial comments that they favour this proposed approach, but there is still some uncertainty over the level of detail required to achieve Ofgem's requirement for the approach to deliver both output reporting and the optimised targeting of asset investment over the GD1 period.

To provide the consistency that the license condition requires, the Safety & Reliability Working Group (SRWG) have been working to derive a consistent methodology for each of the 19 agreed asset groups for reporting to Ofgem by Oct 2015. For these asset groups the SRWG have derived "simple" methodologies. For the more complex asset groups a more complex methodology is required and the SRWG have established that external consultation is required.

Method(s)

The proposed solution is to provide a consistent framework for reporting monitised risk removal utilising asset health data, probability of failure and deterioration rates data already developed by the GDNs. The project will seek assistance from an external service provider to liaise with the GDNs and work to create this consistent risk trading framework reportable to Ofgem. Although all asset groups within the GDNs will need to be scored on a monitised risk basis, this project will focus on the next set of 5 asset groups as a follow on from the proof-of-concept work done alongside Phase 1 and 2. Development timescales will be agreed for the remaining 9 asset groups upon receipt of Ofgem's response to the proposed methodology but this is not in the scope of this NIA project.

Phase 3 Application of the methodology to complex asset groups, including Risers (MOBs), Offtake/PRS Filters, Offtake/PRS Slam-shuts & Regulators, Offtake Odorisation, Offtake Meters. The development of these models is inherently more complicated than those covered in phase 2 due to an increased level of co-dependencies, redundancy considerations, and the volume of separate replacement and refurbishment interventions options.

As part of the development and application of the methodology, each of the proposed Event Trees for each Asset Group and Sub-asset Group need to be validated and approved. This will be delivered by:

- Confirming completeness and accuracy of Event Trees developed to date with GDN experts.

- Confirming which Asset Sub-groups need to be included to enable a useful list of "trade-offs" to be produced for comparison in the 'Evaluate Costs and Benefits of Intervention' stage. This may include the development and finalization of individual risk maps for any subgroups that will be required to differentiate failure/deterioration rates and investment costs. An example of how Asset Groups could be disaggregated include:

        a. Material

        b. Pressure Tier

        c. Function/purpose

d. Geography / Network

e. Asset Health category

To support the overall development, on-going maintenance and liaison with all stakeholders, it is proposed that a series of libraries be developed. Develop a Data Requirements Specification (DRS) for each Event Tree, identifying potential data sources for asset volumes, intervention types, failure probabilities and failure consequences.

The development of these risk models will enable the GDN's to demonstrate network risk removal as a result of the investment strategies outlined in their Final Proposals and how risk trading can be applied across asset groups.

Scope

The purpose of the project is to provide a new methodology for delivering the requirements for Ofgem reporting. The collaborative working across the GDNs will provide a consistent benchmark for reporting a complex solution in a pragmatic way. DNV GL and ICS will be looking to determine pioneering research into failure modes, probability of failure and consequence analysis using both GDN supplied failure, investment data and industrially published data to facilitate the development of the following Event Tree models:

- Offtake / PRS Regulator and Slamshut systems
- Offtake / PRS Filters Systems
- Offtake Odorisation Systems
- Offtake Metering Systems
- Risers

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Objective(s)

The objective of this projects is to:

- Develop Event Tree models to enable quantification of monitised risk for the 5 proposed risk models listed above covering reportable asset groups.
- Provide a solution that must be readily accessible and easily incorporated into the asset management working activities of the GDNs.

Consumer Vulnerability Impact Assessment (RIIO-2 Projects Only)

n/a

Success Criteria

Throughout the project there will be frequent meetings held by the SRWG and with the external company to update on project progress and keep within key milestones. Each stage will have its own deliverables and targets which the project will measure against the original scope. The project seeks to deliver:

- Demonstrable models for deriving monitised risk for each of the 5 asset groups
- Provide a solution that meets the needs of Ofgem namely
- Assets Groups are modeled at an optimum level
- Will enable risk trading and demonstrate this through multiple investment scenarios
- Integration of the models into the businesses of the GDNs
- Provide final project report detailing:
- How the model have been developed and agreed including data sources and assumptions
- Cost benefit of investment for each asset group through monitised risk analysis

Risk trading approach and the outputs of risk trading principles

Project Partners and External Funding

n/a

Potential for New Learning

n/a

Scale of Project

The proposal will be one key stage following completion of Phase 1 & 2:

- Phase 3 – Offtake / PRS Regulator and Slamshut systems, Filter systems, Offtake Odorisation systems, Offtake Metering systems and Risers (MOBs)

Technology Readiness at Start

TRL6 Large Scale

Technology Readiness at End

TRL7 Inactive Commissioning

Geographical Area

GB All GDN's

Revenue Allowed for the RIIO Settlement

Each of the GDNs will have varying levels of allowed revenue in each asset class that the project covers.

Indicative Total NIA Project Expenditure

The expected total cost is £406,286.64 90% of which is allowable NIA expenditure.

The expected external cost is £305,020.00

25% Internal cost is £101,266.64

The costs are being shared proportionally amongst the 4 GDNs on a 4:2:1:1 basis as shown below:

	Ext	Int	Total
NGG	£152,510.00	£50,633.32	£203,143.32
SGN	£76,255.00	£25,316.66	£101,571.66
NGN	£38,127.50	£12,658.33	£50,785.83
WWU	£38,127.50	£12,658.33	£50,785.83
Total	£305,020.00	£101,266.64	£406,286.64

Project Eligibility Assessment Part 1

There are slightly differing requirements for RIIO-1 and RIIO-2 NIA projects. This is noted in each case, with the requirement numbers listed for both where they differ (shown as RIIO-2 / RIIO-1).

Requirement 1

Facilitate the energy system transition and/or benefit consumers in vulnerable situations (Please complete sections 3.1.1 and 3.1.2 for RIIO-2 projects only)

Please answer **at least one** of the following:

How the Project has the potential to facilitate the energy system transition:

n/a

How the Project has potential to benefit consumer in vulnerable situations:

n/a

Requirement 2 / 2b

Has the potential to deliver net benefits to consumers

Project must have the potential to deliver a Solution that delivers a net benefit to consumers of the Gas Transporter and/or Electricity Transmission or Electricity Distribution licensee, as the context requires. This could include delivering a Solution at a lower cost than the most efficient Method currently in use on the GB Gas Transportation System, the Gas Transporter's and/or Electricity Transmission or Electricity Distribution licensee's network, or wider benefits, such as social or environmental.

Please provide an estimate of the saving if the Problem is solved (RIIO-1 projects only)

Enable the benefits of expenditure across different asset health investment categories to be articulated and compared on a consistent basis that will be required for annual Regulatory Reporting, the development of GD2 business plans and evidencing the value in possible risk trading scenarios that are required due to improved asset health data position.

Through risk trading between these investment categories will allow the GDNs to insure that asset risk removal is prioritised in a manner that is accepted by stakeholders, ensuring they continue to get best value from the investment GDNs make in the gas distribution network and provides transparency and scrutiny by stakeholders consistently across all GDNs.

Ensure that GDN licence conditions are fulfilled, specifically to enable the evaluation the Network Risk Measure relating to the overall level of risk to the reliability of the network and the interdependence between assets (as per licence condition 4G.5), plus take account of trade-offs between asset categories and the difference between the risk profile of the relevant assets with and without intervention (as per licence condition 4H.5).

Enable the trade-off across investment categories by normalising risk across asset groups and will allow investment to target assets that pose the highest monetised risk relating to security of supply, process safety, public injury and environmental factors. Data gathered relating to these factors, enables the development, comparison and prioritisation of investment plans. If successful, reports will be produced to show the discounted costs and benefits associated with different intervention regimes for each of the 5 Groups. This will provide understanding on the impact of investment decisions on reducing the overall risk of a gas network.

Please provide a calculation of the expected benefits the Solution

Provide value for our customers and stakeholders by ensuring smarter spending is achieved ultimately resulting in a reduction of capital expenditure per unit risk removal in GD2. The proposed models including Phase 1 & 2 of this project cover approximately 95% of our total Asset Health investment categories, which amounts to a Capex spend of circa £1b across all 4 GDNs over the 8-year. RIIO-GD1. It is envisaged that this will enable a reduction in spend of approximately 0.2% for RIIO-GD2, which could result in benefits of around £2m across all 4 GDNs if the maximum benefits are delivered.

Please provide an estimate of how replicable the Method is across GB

The purpose of the project is to provide a new methodology for delivering the requirements for Ofgem reporting. The project is in collaboration with all of the GDNs.

Please provide an outline of the costs of rolling out the Method across GB.

There are no foreseen costs of rolling this method out across GB.

Requirement 3 / 1

Involve Research, Development or Demonstration

A RIIO-1 NIA Project must have the potential to have a Direct Impact on a Network Licensee's network or the operations of the System Operator and involve the Research, Development, or Demonstration of at least one of the following (please tick which applies):

☐ A specific piece of new (i.e. unproven in GB, or where a method has been trialled outside GB the Network Licensee must justify repeating it as part of a project) equipment (including control and communications system software).

☑ A specific novel arrangement or application of existing licensee equipment (including control and/or communications systems and/or software)

☐ A specific novel operational practice directly related to the operation of the Network Licensees system

☐ A specific novel commercial arrangement

RIIO-2 Projects

☐ A specific piece of new equipment (including monitoring, control and communications systems and software)

☐ A specific piece of new technology (including analysis and modelling systems or software), in relation to which the Method is unproven

☐ A new methodology (including the identification of specific new procedures or techniques used to identify, select, process, and analyse information)

☐ A specific novel arrangement or application of existing gas transportation, electricity transmission or electricity distribution equipment, technology or methodology

☐ A specific novel operational practice directly related to the operation of the GB Gas Transportation System, electricity transmission or electricity distribution

☐ A specific novel commercial arrangement

Specific Requirements 4 / 2a

Please explain how the learning that will be generated could be used by the relevant Network Licensees

All GDNs will be able to use the learning generated as the outcomes will be related to each individual and the Event Tree analysis models implemented from this project will be the same. As a result, this will be easily adopted into the individual GDN businesses

Or, please describe what specific challenge identified in the Network Licensee's innovation strategy that is being addressed by the project (RIIO-1 only)

n/a

☑ Has the Potential to Develop Learning That Can be Applied by all Relevant Network Licensees

Is the default IPR position being applied?

☑ Yes

Project Eligibility Assessment Part 2

Not lead to unnecessary duplication

A Project must not lead to unnecessary duplication of any other Project, including but not limited to IFI, LCNF, NIA, NIC or SIF projects already registered, being carried out or completed.

Please demonstrate below that no unnecessary duplication will occur as a result of the Project.

n/a

If applicable, justify why you are undertaking a Project similar to those being carried out by any other Network Licensees.

n/a

Additional Governance And Document Upload

Please identify why the project is innovative and has not been tried before

n/a

Relevant Foreground IPR

n/a

Data Access Details

n/a

Please identify why the Network Licensees will not fund the project as apart of it's business and usual activities

n/a

Please identify why the project can only be undertaken with the support of the NIA, including reference to the specific risks(e.g. commercial, technical, operational or regulatory) associated with the project

n/a

This project has been approved by a senior member of staff

☑ Yes