Notes on Completion: Please refer to the appropriate NIA Governance Document to assist in the completion of this form. The full completed submission should not exceed 6 pages in total.

NIA Project Registration and PEA Document

Date of Submission

Feb 2016

Project Reference Number

NIA_NGN_157

Project Registration

Project Title

Analytical Approaches to Asset Management

Project Reference Number

NIA_NGN_157

Project Licensee(s)

Northern Gas Networks

Project Start

February 2016

Project Duration

0 years and 6 months

Nominated Project Contact(s)

Gareth Mills (Project Lead) & Tony Pearson (Project Manager)

Project Budget

£293,040.00

Summary

The scope of the project is to use the skills, experience, approaches, methodologies and advanced modelling techniques from an alternative high performing area of asset management (KPMG / McLaren) working with NGN to examine the areas of challenge and opportunity outlined in the “Problem” section above for potential benefits. In this project we are investigating approaches from outside of the gas industry to determine whether or not these are not only transferable but will help us address some gas industry challenges. Note that this list may not be exhaustive and will be further refined and defined in the early stages of the project.

Third Party Collaborators

KPMG

McLaren Alliance

Nominated Contact Email Address(es)

innovation@northerngas.co.uk

Problem Being Solved

Our current approaches do not sufficiently address certain areas of network management requirements, risks and uncertainties, for example:-

- Uncertainties around point demand forecasts and how these may be addressed
- Optimisation of asset investment decisions based on asset health is primarily based on subjective rather than data driven insight.
- Knowledge mostly resides in the minds of the experienced asset planners, a demographic who are nearing retirement. How could this risk be addressed?
- Untested failure curves for assets that cannot be allowed to fail.

- Could the broader impact of variable pressure management in the network on investment decisions be more clearly defined?
- Are there alternative methods for managing infrequent high-demand scenarios?

Method(s)

The methods to be used are developed around themes that underpin high performance in Formula 1.

- Insights from simulation: Constrained budgets and limited testing time have made modelling and simulation critical to Formula 1 success.
- Winning culture: Winning performance is delivered by highly motivated individuals working together towards common goals.
- Planning to win: Augmented decision support through visualisation and prescriptive analytics.
- Rigorous execution: Execution against robust plans is critical: everyone knows what is required of them and planning has considered individuals' capabilities.

These elements are all interlinked, however, they are grouped into four themes. These themes are used as lenses to explore hypotheses and concepts. This focused attention enables exploration of "art of the possible" for hypotheses and concepts before pulling them all together to develop an integrated concept, value case and implementation plan.

In order to co-ordinate the activities in each of the themes there will be a mission control. Mission control will have accountability for the development of the concept(s). The key role of mission control is to balance delivery risk with ambition.

Scope

The scope of the project is to use the skills, experience, approaches, methodologies and advanced modelling techniques from an alternative high performing area of asset management (KPMG / McLaren) working with NGN to examine the areas of challenge and opportunity outlined in the "Problem" section above for potential benefits. In this project we are investigating approaches from outside of the gas industry to determine whether or not these are not only transferable but will help us address some gas industry challenges. Note that this list may not be exhaustive and will be further refined and defined in the early stages of the project.

Objective(s)

The challenges that have been identified are long standing, complex and industry wide. Therefore the first phase of this project will be focused on understanding the 'art of the possible' i.e. what would the concept of a solution look like.

The combined NGN / alliance team will have unique insights into the specifics of the challenge (NGN) and the latest thinking in the application of analytics (alliance). At the end of this phase, the combined team will be able to share insight into whether an opportunity exists, and if so, an indication of the size of the prize, route map and risks.

- The outputs from this phase will capture findings, insights and opportunities from collaborative workshops, interviews and innovation stimulation events. These will be used to generate and refine hypotheses. The most viable hypotheses will undergo further investigation, from which a holistic description will be developed that covers key elements of the operating model. Where appropriate a visual representation of the concept will also be created.
- The feasibility of these concepts will also be detailed, and will include operating model impacts, risks and a value case (financial and non-financial value).
- A high level implementation plan will show what key activities are required to further develop and deliver each viable concept

Consumer Vulnerability Impact Assessment (RIIO-2 Projects Only)

n/a

Success Criteria

- Capture findings, insights and opportunities from collaborative workshops, interviews and innovation stimulation events
- Generate and refine hypotheses and investigate the most viable ones further
- Where appropriate develop a visual representation of the concept(s)
- Develop feasibilities of these concepts, including risks and costs.
- NGN will have learnt new ways of thinking (methods etc.) and working to approach complex challenges
- NGN will be able to make an informed decision to proceed with developing and implementing new tool(s) and / or process(es) based on a robust business case supporting viable hypotheses

Project Partners and External Funding

n/a

Potential for New Learning

n/a

Scale of Project

12 week project focused on optimizing asset investment and management decisions applicable to asset types and processes within NGN.

Technology Readiness at Start

TRL4 Bench Scale Research

Technology Readiness at End

TRL6 Large Scale

Geographical Area

NGN-wide

Revenue Allowed for the RIIO Settlement

None

Indicative Total NIA Project Expenditure

External £220,000

Internal £73,040

Total £293,040

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)

This is a piece of research whose outputs would include an estimate of the potential benefits which could be delivered by future development and deployment

Please provide a calculation of the expected benefits the Solution

Not applicable for research project

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

Applicable across all network Licensees

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

Since the reasearch is about exploring the opportunities this novel analytical approach could offer to networks, the costs of rolling out the method cannot be estimated at this stage.

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

- The challenge is to identify how advanced analytical modelling techniques across a range of asset types and operational challenges typical across all networks can be used to deliver performance outcomes and better manage risk and uncertainty in asset investment and management.
- The challenges faced by NGN in this area are industry-wide, therefore any methods, insight and learning from developing better analytical modelling techniques is likely to be applicable for other Network Licensees.

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

- The challenge is to identify how advanced analytical modelling techniques across a range of asset types and operational challenges typical across all networks can be used to deliver performance outcomes and better manage risk and uncertainty in asset investment and management.

☑ 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