

NIA Project Registration and PEA Document

Date of Submission

Mar 2019

Project Reference Number

NIA_SGN0143

Project Registration

Project Title

Distribution Network Information Modelling – Stage 1

Project Reference Number

NIA_SGN0143

Project Licensee(s)

SGN

Project Start

March 2019

Project Duration

0 years and 4 months

Nominated Project Contact(s)

Oliver Machan, Innovation Project Manager

Project Budget

£23,331.00

Summary

Accurate records are crucial to the successful operation of our business. Our current representation of the distribution network pipeline infrastructure is an amalgamation of historical paper maps along with drawing consolidation where projects to either replace old mains or added new ones for reinforcement have been undertaken. This means absolute location of the pipes unknown, generally working to +/- 1m.

Nominated Contact Email Address(es)

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Problem Being Solved

Accurate records are crucial to the successful operation the GDN's. The current representation of the distribution network pipeline infrastructure is an amalgamation of historical paper maps along with drawing consolidation where projects to either replace old mains or added new ones for reinforcement have been undertaken. This means absolute location of the pipes unknown, generally working to +/- 1m.

Not knowing the exact location or size and material of the pipes can lead to inefficiencies and safety issues when carrying out works.

Within all GDNs, routine use of key holes to access the network internally along with new techniques and technologies provide an opportunity to rethink how, we interact with the distribution infrastructure and the what form our network data representation takes.

Method(s)

This first stage feasibility project will look to establish a sound cost benefit case for the new method. The approach to determining the potential business value of such data will be as follows:

- Agree the likely improvement in positional accuracy and other topological aspects of the network relative to existing data sources
- In collaboration with the different business areas, define and agree up to 6 business use cases based on existing Network operating

practice over a range of Output Measures.

- Gather cost data and current operating practice for agreed processes.
- Agree revised operating practice and basis for value quantification.
- Build present value model for each new process and examine sensitivity to model assumptions.
- Perform qualitative assessment of environmental and social benefits where possible (Financial and non-financial).
- Draft models and summary output issued.
- Review output and revise value models where necessary.
- Issue final report documenting model assumptions together with working models for Stage 2 use.
- This will mature the project from TRL2 to TRL3, providing the foundations to scope out a likely research and development exercise forming Stage 2.

Scope

The project will carry out a business value study to determine the potential benefit in being able to definitively locate and know the material makeup of the distribution networks and to derive a basic technology specification requirement.

Objective(s)

The objective is to determine the potential value in being able to definitively locate and know the material makeup of the distribution networks and to derive a basic technology specification requirement.

The first task of Stage 1 is to look for processes and operations in the business that would benefit financially from having accurate location (+/- 3cm) and material information. Although these are yet to be generated through a workshop exercise, initial thoughts are that a long list could include:

1. Customer Service – Connections
2. Safety – provision of asset location data to both SGN and 3rd party work forces
3. Emergency – Mains leakage (keyhole/core positioning)
4. Emergency - Managing water ingress (topographical)
5. Repair – Mains repair
6. Network Planning – Network reinforcement (capex) to maintain minimum pressures and 1-in-20 supply
7. Network Planning – Replacement (Repex) planning and delivery
8. Environment – Leakage management

By developing 6 value case propositions in Stage 1 will inform the value that could be released from having accurate information as well as defining a high-level scope of the technology types and specifications that we'd need to work to for the Stage 2 research and development exercise, likely to incorporate the concepts developed through Building Information Modelling (BIM), but utilising the inside of the pipes.

Consumer Vulnerability Impact Assessment (RIIO-2 Projects Only)

n/a

Success Criteria

Project will be deemed successful if the below has been delivered:

- Up to 6 business use cases based on existing SGN operating practice over a range of Output Measures defined and agreed
- Current operating practice revised processes for agreed functions documented for value quantification
- Draft value models and summary produced allowing quantification of reward/benefits
- Basic technology requirements for minimum specification outlined

Project Partners and External Funding

n/a

Potential for New Learning

This project is expected to provide all Network Licensees with a fundamental understanding of whether it is economically advantageous to introduce a Distribution Network Information Modelling system which is able to pinpoint the location and makeup of the underground network.

Scale of Project

The project is a desktop study that will consist of workshops with various departments throughout the business.

Technology Readiness at Start

Technology Readiness at End

TRL2 Invention and Research

TRL3 Proof of Concept

Geographical Area

Stage 1 will be undertaken at vendors offices with workshops carried out within SGN.

Revenue Allowed for the RII Settlement

n/a

Indicative Total NIA Project Expenditure

Total expenditure is £23,331, 90% of which (£20,998) will be recovered via NIA funding mechanism in line with the funding conditions.

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)

Stage 1 is low TRL and is to evaluate the savings that would be made with a DNIM system.

Please provide a calculation of the expected benefits the Solution

The next Stage of the project will provide likely method cost benefit analysis.

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

Method is replicable across all GDNs.

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

This project is to evaluate the savings that would be made with a DNIM system. Due to the low TRL, the costs of rolling out the method will be evaluated at a later 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

Method is replicable across all GDNs, as pinpointing location of assets would prove advantageous in network modelling, maintenance and operational activities

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 outcome of the project would affect all strategies, in particular reliability and maintenance.

- ☒ 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.

A review of the ENA portal has been made to ensure no duplication will occur as result of this project.

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

There is an opportunity to fuse existing technologies in a new novel way to achieve a currently unattainable cost beneficial outcome.

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

Development in this area is required to produce a system that can be funded under business as usual activities.

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

This NIA project has a low TRL and will involve building, configuring and developing an unproven system that can be used safely within the distribution system.

This project has been approved by a senior member of staff

☒ Yes