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

Nov 2017

Project Reference Number

NIA_NGN_221

Project Registration

Project Title

Data and Schematics Improvement

Project Reference Number

NIA_NGN_221

Project Licensee(s)

Northern Gas Networks

Project Start

December 2017

Project Duration

0 years and 6 months

Nominated Project Contact(s)

Pete Crosier

Project Budget

£48,000.00

Summary

Northern Gas Networks (NGN) engineers use schematics to quickly get an overview of asset locations and sequences when responding to incidents. Schematics are a simplified view of the gas distribution network similar to a London Underground Map.

Historically, at NGN, Schematics are printed on paper and manually created in a CAD system, using an old GIS data extract, for reference. Over time the CAD and GIS systems have become out of sync with data updates being applied in one system and not in the other.

This is causing an operational risk to NGN as field engineers are making decisions based on schematics, which are potentially missing key information. Also, there is no uniform design for schematics; they can vary across operational areas, making them difficult to understand if you're not unfamiliar with a particular area.

Producing a new set of schematics is a labour intensive process and may lead to further data errors.

Third Party Collaborators

1Spatial

Nominated Contact Email Address(es)

innovation@northerngas.co.uk

Problem Being Solved

Northern Gas Networks (NGN) engineers use schematics to quickly get an overview of asset locations and sequences when responding to incidents. Schematics are a simplified view of the gas distribution network similar to a London Underground Map.

Historically, at NGN, Schematics are printed on paper and manually created in a CAD system, using an old GIS data extract, for reference. Over time the CAD and GIS systems have become out of sync with data updates being applied in one system and not in the other.

This is causing an operational risk to NGN as field engineers are making decisions based on schematics, which are potentially missing key information. Also, there is no uniform design for schematics; they can vary across operational areas, making them difficult to understand if you're not unfamiliar with a particular area.

Producing a new set of schematics is a labour intensive process and may lead to further data errors.

Method(s)

NGN would like to generate accurate Schematics from a single source of accurate data. This process should be repeatable and take into account changes in asset records.

This proposal, working with 1Spatial as project partner would recommend, creating schematics from NGN's GIS database and automating the production process, reducing the need for manual working and giving NGN the ability to update schematics when changes are made to GIS asset records. This will minimize the risk of data being out of date or missing from schematics.

Before the schematics production process can be automated we'd first also recommend that GIS data is accurate and complete otherwise key elements will not appear on the schematic output or be misrepresented.

1Spatial will use a specialist rules engine to first automatically assess and then improve asset data quality. The same rules engine can then also be used to create the schematic.

Workshops will take place on NGN premises and bring together key stakeholders in the business. Packages of work will be defined prioritised and used to create a backlog of work. The backlog tasks will be assigned to two sprints

The following sequential steps will be carried out by 1Statial and the project team:

In order for 1Spatial to provide an accurate cost for steps 5-8, steps 1-4 must be first be completed.
This proposal forms the basis for completing tasks 1 to 4 only.

1. Assess where there is missing inaccurate data in GIS that would affect the ability to generate schematics automatically
2. Recommend improvements to the quality of data in GIS that would enable the ability to generate schematics automatically
3. Agree the common standard for what needs to be shown on the schematics and how it should be displayed (features, labelling, symbology, colouring etc..)
4. Agree a schematics production process (generation frequency and method, handling incremental, manual editing method, publication and usage)
5. Apply data updates of cleaned data to GIS
6. Recommend how we make this process repeatable
7. Implement and automated process for schematics production using GIS data
8. Remove the need for paper copies by having the schematics digitally available

During each sprint, the project team will work through the assigned tasks, test outcomes and make measurable improvements. When we have made the required changes and tested the results, we present these back to stakeholders in a Retrospective.

Through the Retrospective, we learn from our experiences and agree actions to make sure we continuously improve for the next iteration. The entire process will be a collaborative effort between NGN subject matter experts and 1Spatial.

Scope

The Workshops will take place and bring together key stakeholders in the business.

Packages of work will be defined prioritised and used to create a backlog of work. The backlog tasks will be assigned to two sprints. During each sprint, we'll work through the assigned tasks, test outcomes and make measurable improvements.

When the required changes have been completed and the results validated, this will be presented back to stakeholders in a Retrospective. Gain feedback and agree actions to make sure we continuously improve for the next iteration. The entire process will be a collaborative effort between NGN subject matter experts and 1Spatial.

Methodologies for agile data consultancy will be followed to ensure collaboration, eliminate errors and maximize outputs.

Objective(s)

The project objectives are to understand and record:

1. What accurate data should look like
2. What is missing from GIS data to make it accurate
3. What a standard schematic should look like
4. What the process flows for creating a schematic should be

Consumer Vulnerability Impact Assessment (RIIO-2 Projects Only)

n/a

Success Criteria

- Data quality and validation report
- Measurable “first pass” improvement in data quality
- Documented set data rules for improving data quality
- Recommendations for future data enhancement
- Schematics template agreed with NGN
- Schematics production workflow document
- Costed schematics production recommendations and options report

Project Partners and External Funding

This project is completely funded by NIA.
Northern Gas Networks
1Spatial

Potential for New Learning

The learning that can be derived from the development of a GIS-based solution to address majority of schematic issues is in the form of technology driven evidenced based data anaylsis, followed up with full desktop analysis of MP schemes delivered since 2013.

It is hoped that the research will provide a good overview of the modern technology that could be applied to this situation

Scale of Project

The project will identify suitable solutions through a feasibility study, where a solutions will be made to enable progression to a potential phase 2 of the project.

Technology Readiness at Start

TRL2 Invention and Research

Technology Readiness at End

TRL3 Proof of Concept

Geographical Area

NGN’s Network

Revenue Allowed for the RIIO Settlement

N/A

Indicative Total NIA Project Expenditure

NGN External expenditure £36,000

NGN Internal cost £12,000

Total expenditure £48,000

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)

The results of this feasibility study will provide options to enable future projects to engineer solutions and therefore will be primarily qualitative. Financial benefits will only being calculable on delivery of the full solution and on completion of all phases of the project.

Please provide a calculation of the expected benefits the Solution

This phase of the project will not fix all the data issues reported during the above process we will however, look to make some measurable improvement, give an understanding of the scale of the problem highlight and make recommendations for areas of improvement.

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

The operation is carried out by all Licensees, therefore the learning and implementation could be undertaken by all.

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

Unable to evaluate until after the project is completed.

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 solution from the this phase of the project will provide learning for all Network Licensees in relation to mapping data and the use of technology systems.

All network licensees will be able to learn from the developments of this project.

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 addressed from this phase of the project is the ability to minimize operational risk to NGN as field engineers are making decisions based on schematics, which are potentially missing key information.

Also, there is no uniform design for schematics; they can vary across operational areas, making them difficult to understand if you're not unfamiliar with a particular area.

☑ 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

This project is innovative and has not been tried previously following recent advancements in digital mapping technology.

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

We recognize the need to build upon and improve our current method of recording and managing MP schematics and associated date. This feasibility study is low level TRL and the outcomes are uncertain and clarity is needed to evaluate future potential hence the reason we are investing in this project through the NIA mechanism.

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

At NGN we currently use a manual transfer of data for recording of MP schematics, this technique has not changed in a number of years and whist proving effective, albeit with error management required, there are areas where improvement may be possible from a safety and customer perspective to enable change from current practice. The uncertainty of this research is appropriate for NIA funding due to the fact that commercially the current products and techniques as sufficient. However the application through the use of the current method presents safety and efficiency risk and given the advancement in current technologies may be improved.

This project has been approved by a senior member of staff

☑ Yes