NIA Project Registration and PEA Document

Date of Submission

Mar 2017

Project Reference Number

NIA_NGN_202

Project Registration

Project Title

MRPS Digital Map-Based Data Capture and Mobile GIS

Project Reference Number

NIA_NGN_202

Project Licensee(s)

Northern Gas Networks

Project Start

April 2017

Project Duration

0 years and 8 months

Nominated Project Contact(s)

Brendan Kitson

Project Budget

£68,000.00

Summary

This is a three stage project, looking to investigate existing processes and technology within NGN, and develop a smart and accurate prototoype system and process, to imrpove the effciency and quality of field date capture, to enable the seamless transfer of field data directly back into existing business processes and main asset repositories, reducing the need for human intervention and pre and post processing of data.

- Stage 1 will undertake a design requirements investigation

- Stage 2 will develop the application and design test requirements

- Stage 3 will undertake live field trials using the prototype application

Third Party Collaborators

OPEX

Mobile GIS Servic

Nominated Contact Email Address(es)

innovation@northerngas.co.uk

Problem Being Solved

The Mains Replacement Priority Scheme (MRPS) risk prioritises Cast Iron (CI) gas mains within the UK allowing scheduling of their replacement as part of the gas mains replacement programme (GMRP). As part of this process, the Networks undertake on-site surveys using operatives to collect various data about their assets and surrounding features.

MRPS surveys currently relies on identifying proximity zones using existing network records such as GIS and as-laid drawings. On-site

surveys are then undertaken by a competent operative, making note of all required data on a paper record or fillable electronic forms. Records are sent back to the network, feeding in to the MRPS replacement programme.

MRPS surveys are process/assumption heavy and require substantial pre and post processing of collected data. Northern Gas Networks (NGN) have produced internally a proof of concept 'app' that could be used to ease the input required on site for the operative. This app has proved a valuable tool to NGN surveyor operatives.

There is a current innovation project to automate the survey results direct into the MRPS system – This is due for completion in February to coincide with full roll out of the electronic solution for data capture

This innovation aims to accelerate the capability of site-centric mapping applications to deliver smart, verifiable and risk-based measurement tools that are both easy to use and cost-effective, whilst delivering significant business value and ROI.

Other identified applications for improved measurement technology include capture of exposed pipeline crossings, as-laid surveys, and DR4 surveys. These applications are not included in this proposal, however this development will allow other survey types to be added in the future.

Method(s)

The technology would be deployed via the existing myWork as an app on a smartphone or tablet, already in use by the survey operatives. . Ordnance Survey digital maps and existing network information, such as gas mains and associated MRPS polygon zones, will be downloaded onto the tablet and displayed in real-time.

The operator will open the app, choose which survey is being undertaken, complete all required measurements and observations and submit. The data captured will automatically populate the existing MRPS data capture form (may need some modification)(digital) and send directly through the MRPS system

Further survey types and functions may be added to the app and accessed from a common interface.

Scope

This is a three stage project, looking to investigate existing processes and technology within NGN, and develop a smart and accurate prototyope system and process, to imrpove the effciency and quality of field date capture, to enable the seamless transfer of field data directly back into existing business processes and main asset repositories, reducing the need for human intervention and pre and post processing of data.

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Objective(s)

Stage 1

- Undertake detailed liaison with MRPS office and field surveying staff at NGN
- Validate proposal and produce high-level design of software requirements and user-interface for proposed solution
- Detailed report of requirements and proposed solution for review and approval by NGN

MGISS will initially undertake detailed network liaison with NGN to evaluate product viability within a number of asset survey methods, smart GIS and spatial analysis within MRPS, and site-based scenarios.

This will determine specific requirements and the level of additional advanced spatial analysis, mobile application development and integration required.

Stage 2

- Develop desktop/web-based geo-processing and GIS analysis tools
- Develop mobile GIS OSMM map-based application for MRPS
- Deliver a minimum viable product (MVP)

Determine a series of test sites where extensive benchmark testing can be undertaken based on a series of typical real-world scenarios. E.g. urban and rural sites, and testing under a full range of environmental and operational conditions

Stage 3

- Test MVP against current process
- Report on any amendments/additions to MVP for further development
- Report on viability and potential ROI

Consumer Vulnerability Impact Assessment (RIIO-2 Projects Only)

n/a

Success Criteria

A successful project will deliver a prototype field based automated survey data gathering tool.

NGN will have defined and proved an efficient and optimal survey method using a combination of smart GIS, mobile workflows and field mapping application for smartphone and tablet platforms, which can be deployed across a wide range of operational tasks, delivering verifiable, accurate, repeatable and risk-reducing functionality.

Ease of use will be the primary operational aim, enabling any field operative to deploy and save time on-site, and eliminate site re-visits.

Develop a MVP for MRPS and associated field survey data capture, GIS asset data processing and integration into NGN business processes

Report a to CBA for future development

Data will be accurately positioned to within predefined tolerances for accuracy

Data will transferred directly into asset repositories

User Acceptance testing will provide positive feedback for further development

Project Partners and External Funding

This project is complete funded by NIA OPEX.

- Northern Gas Networks
- MGISS

Potential for New Learning

Future wider application for:

- Integration of laser rangefinder and possible areas of further use to allow for data be accuratelypositioned in the field within given tolerances which can deliver accurate data be transferred to main Network Systems without manual intervention
- Inclusion of additional surveying activities to be encompassed via the use of this technology, with some level of modification to widen the scope.

Scale of Project

The project will be undertaken by NGN DLO surveyors managed by the NGN survey team, working in the Northern Gas Networks region.

The project would include desktop research, a review of scope, design and development followed by fieldtrials. Upon completion of these activities a technical report will be produced.

Technology Readiness at Start   Technology Readiness at End

| TRL4 Bench Scale Research | | TRL6 Large Scale |

Geographical Area

Northern Gas Networks region.

Revenue Allowed for the RIIO Settlement

N/A

Indicative Total NIA Project Expenditure

NGN External expenditure - £68,000

NGN Internal expenditure - £17,000

Total NGN expenditure - £85,000

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)

There are a number of qualative benefits that this proposal offers, a primary benefit is the ability to send accurate digital data to a field based engineer and allow electronic transfer back into work management systems to enable timely reporting.

The process is automated that also has spin off benefits. The transfer of data to allow quality assurance via in-built validation that enables real time audit and the potential for the use of that data for operational progress reports, and management information. Also removing the need for existing Labour intensive administrative tasks.

Please provide a calculation of the expected benefits the Solution

Current cost:

The automatic transfer of data mechanism will remove the need for the resource cost of an administrative
role.

- Administration role (time and 23,000 sheets of paper and printer ink) - £35,000 p.a.
- Reduction in travel cost - £280 p.a. (2000 x £0.14/mile)
- Reduction in travel hourly cost (survey manager) - £2000 (80 hours x £25/hr)

Cost saving - £37,280

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

£37,280 x 8 GDN's = £298,240 per annum

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

This will be subject to each individual network licensee's strategy.

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 digital survey system could be used by all network licensees, as all licensees are required to undertake risk prioritisation 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 use of digital transfer of mapping data to and from site removes the need for back office support functions to undertake administrative tasks. This enhances the user experience, ensures greater data accuracy and removes the likelihood for human error. The removal of the requirement for administrative work allows for greater impact and efficiency.

☑ 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 thorough check of the ENA Smarter Networks Portal

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