NIA Project Registration and PEA Document

Date of Submission

May 2020

Project Reference Number

NIA_UKPN0058

Project Registration

Project Title

Line Search

Project Reference Number

NIA_UKPN0058

Project Licensee(s)

UK Power Networks

Project Start

May 2020

Project Duration

1 year and 3 months

Nominated Project Contact(s)

Ludivine Zanga

Project Budget

£209,000.00

Summary

Inaccurate underground infrastructure data are being sent out to thousands of users on a daily basis with no recommended avenue for improvement through the existing systems.

Line Search Before You Dig (LSBUD) was the first step trying to utilise survey feedback data to improve the data accuracy and much more.

Nominated Contact Email Address(es)

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Problem Being Solved

UK Power Networks provides network maps to a wide variety of third parties ('Users') working near its network on a daily basis. These include utilities, contractors, developers, the general public and landowners. There is always a risk that these parties may accidentally strike a buried cable. This endangers lives, incurs costs, causes disruption and can result in reputational damage to the instigator and the asset owner.

Occasionally the data recording the asset location is inaccurate. This introduces uncertainty, risk and additional cost into construction projects. It may also have a negative impact on the UK economy and society as a whole.

The root cause of the problem lies in the historical difficulties of capturing accurate asset locations in the days before technology made this a routine task.

Method(s)

Line search before you dig (LSBUD) is a free to use online search service that any individual can use to check their works against over 75 asset owners' utility assets. Every day LSBUD receive over 3,000 enquires from Users requesting UK Power Networks' network maps. The data generated by this activity will tell us Where, Who, When, and What has been done near our network. Gathering feedback from the Users could be utilised to improve the quality of asset data.

The Line Search project provides an avenue for improvement through two main methods:

1)   Capture user's feedback which will be visualised (on a GIS platform) and utilise the existing data captured by LSBUD in order to correlate to third party faults.

2)   Maximise the opportunity to get feedback on data quality through crowdsourced data return.

The Line Search project will allow utilities to:

1)   Undertake protection activities based on the knowledge of third party working.

2)   Relate to damages to understand what third parties have done before a utility strike leading to quicker fault location determination.

3)   Escalate certain works based on work type or proximity to more sensitive assets.

4)   Prioritise areas of the network with poor data quality and plan for corrective actions.

Scope

Data from third party users of UK Power Networks' maps will be embedded into UK Power Networks' GIS tool, the Geospatial Analytics Web Application (GSA). Additional feedback from the users will be captured and added to GSA.

The project will be delivered by the following phases:

1)   Discovery, including a workshop to stablish User personas, user stories, and prioritised features.

2)   Develop an API to make LSBUD data available to UK Power Networks.

3)   Development including GSA integration and a customer survey feedback gathering platform.

4)   End to end trial of the Line Search process on a selected part of the network.

5)   Assessment of feasibility of BaU integration including complete roll-out across UK Power Networks.

The project involves a project partner LSBUD which will provide location data of the Users on the network maps.

Objective(s)

The objectives are:

·   To make third party 'User' data available to UK Power Networks and visualise it in GSA.

·   To assess the feasibility of using this data to improve safety, improve data quality, fault location, third party damage prevention and cost recovery for a trial area which has vectorised data.

·   To determine the scale of 'User' feedback and feasibility of roll-out across UK Power Networks.
To understand the impact on 'User' relations.

Consumer Vulnerability Impact Assessment (RIIO-2 Projects Only)

n/a

Success Criteria

The project will be considered a success when:

·   The development of the GSA platform meets UK Power Networks' requirements and fulfils the project's objectives.

·   It has determined the feasibility of using crowdsourced data together with LSBUD data to improve legacy network GIS records.

·   The trials confirm the initial benefit assumptions were correct or the CBA will be revisited with actual costs to determine whether the Line Search project methods can be used as a BaU solution.

Project Partners and External Funding

The project will be carried out with support with support from LSBUD by contributing and sharing their data with UK Power Networks.

Potential for New Learning

The project is likely to demonstrate that integrating LSBUD data with customer feedback could be used as a reliable source of

improving network record data.

The CBA will confirm whether the benefits could be realised and Line Search could be used by utilities to help with issues related to legacy network records as well as tracking who was excavating in an area.

Scale of Project

The project will be tested in a trial area in south London. The project size has been determined to ensure that the solution would be in an area with a vectorised network records and the anticipated feedback data is manageable, while providing sufficient evidence to be able to reassess the business case for roll-out.

Technology Readiness at Start

TRL4 Bench Scale Research

Technology Readiness at End

TRL8 Active Commissioning

Geographical Area

The project will apply to underground cables in a trial area in UK Power Networks' SPN network.

Revenue Allowed for the RIIO Settlement

No revenue has been allowed for this project in the RIIO-ED1 settlement.

Indicative Total NIA Project Expenditure

£181,100

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 key saving that could be achieved by deploying this solution is the reduced costs associated with underground cable damages. It is estimated that by using Line Search, UK Power Networks could increase the cost recovery by an additional 30% associated with third party cable strikes.

Also, Improving data quality by having better location of underground cable means less site surveys, smaller excavations, and quicker roadworks which lead to the following social benefits:

1-   Reduced traffic disruption.
2-   Reduced risk of injuries or fatalities due to cable strikes.
3-   Quicker maintenance activities.

Above social benefits have not yet been quantified.

Please provide a calculation of the expected benefits the Solution

The expected financial benefits for RIIO-ED1 are:

Base cost: £1,796k
Method cost: £1,824k
Method Benefits: £446k
NPV: Base Cost – (Method Cost – Benefits): £418k

The benefit shown is from 2021 to 2023 for demonstration project. It assumes half of the benefits expected during the first year while transitioning to BaU.

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

All of the other five DNO Groups in GB have underground cables on their electricity distribution networks. Hence the method proposed in this project will also apply to them. It is estimated that each DNO incurs similar cable damage costs to UK Power Networks provided each DNO Group has an already existing software tool to implement Line Search solution. UK Power Networks is utilising its existing Geospatial Analytics tool (GSA) to implement the solution.

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

This method could be applied to every DNO in GB at a similar method cost considering/assuming the following:
1.   Every DNO uses the same method by having an existing GIS tool similar to GSA which could be integrate third party data

2. Assuming similar internal costs (e.g. project management, underground cable recovery)
The cost of testing the conductors is similar to this project.

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 learning aims to provide the feasibility of bringing customer feedback and LSBUD data together and improve network records for any utility with underground linear assets. All GB utilities have similar underground assets therefore learning from UK Power Networks will be transferable to other DNOs or utilities. Other network licenses or utilities can use a similar solution for their underground infrastructure safety programmes to reduce utility strikes, reduce costly damages to assets, reduce traffic disruption and improve customers health and safety.

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

Not applicable.
☑ 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.

At present, there are no similar projects which are being undertaken by GB DNOs covered by the NIA.

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

Traditionally DNOs and utilities, in general, provide network data to the users without getting any feedback from them. However, no standard approach exists to provide a feedback or inform utilities about the quality of data or potential works planned near the network. This project provides an innovative approach to the issue of data quality and managing third party activities near the network. It demonstrated a robust methodology by gathering LSBUD data and combining them with crowdsourced surveys. It generates knowledge's that can be shared with other DNOs. The same methodology can be used to gain similar benefits. The main focus areas lie on customer safety, stakeholders engagement as well as communication and data. We believe that this has not been tried before because the LSBUD data on network requests has not always been available in a coordinated way.

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

The solutions being explored on the project are still at a low TRL level and there are several issues and risks to overcome before the solution can be deployed as part of business as usual activity.

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

The project can only be undertaken as an innovation project given the operational risks associated with the deployment of an unproven solution in network operations. The solution requires a network trial to prove its viability. As noted in the NIA guidance, certain projects are speculative in nature and yield uncertain commercial returns. This is the case with this project. There is a commercial risk that the solution trialed in the project is not adopted at the end of the project. This could be due to the fact that the solution has not reach the level of maturity required for business-as-usual application. If the project is successful, it will have proven a technical solution which will improve network performance. As this type of survey has not been used in the UK before, it is an unproven method therefore comes with risks. Specifically business risks needs to be assessed/monitored as these type of survey is unproven and there will be a significant expense to trial the responses and hence this cost is being requested through the NIA.

This project has been approved by a senior member of staff

☑ Yes