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

Jan 2016

Project Reference Number

NIA_UKPN0016

Project Registration

Project Title

RoadMender reinstatement trial

Project Reference Number

NIA_UKPN0016

Project Licensee(s)

UK Power Networks

Project Start

January 2016

Project Duration

2 years and 0 months

Nominated Project Contact(s)

Ian Cooper (ian.cooper@ukpowernetworks.co.uk), Paul Dooley (paul.dooley@ukpowernetworks.co.uk)

Project Budget

£493,106.00

Summary

The project aims to demonstrate alternative reinstatement technique to the traditional method so as to reduce process cycle time, waste and cost, whilst improving quality of reinstatement and customer satisfaction, within the three UK Power Networks DNO areas.

The project will:

- Prove the consistency of material type mixes against the appropriate BS EN standard
- Ensure that the material has the correct ware resistance
- Trial the reinstatement technique at a number of sites involving different work types and surface reinstatement materials over a period of 3-6 months.
- Carry out comparison evaluations between existing and new reinstatement method.
- Invite local authorities to comment on the reinstatement method and material

Nominated Contact Email Address(es)

innovation@ukpowernetworks.co.uk

Problem Being Solved

UK Power Networks continually strives to run a sustainable and customer driven business. This project is aimed to address both of these areas by delivering what stakeholders want in terms of reduced duration of work on the street and reduced costs to conduct that work.

At present UK Power Networks has c.14,600 works per year that can be classified as involving small excavations (less than 2m2); this

includes faults, new customer connections, link box replacements, link box frame and cover replacements, pole replacements and public lighting faults. Also with the ever increasing pressure on people's time more customer connection work is being requested to take place over the weekend and for fault work to be done as a continuous process (locate, dig, fix, reinstate). This is difficult when asphalt plants, required for reinstatement materials, typically close at 3pm each day and do not open at weekends.

There is also an increase in local authorities demanding that we are off the highway quicker so that they can meet their network management duty to make the road available to the travelling public for the majority of the time.

Much work has been done to reduce the process time to do work and amount of contaminated soil that goes to landfill. The major process issue is now the time it takes to complete the reinstatement phase of work and guarantee the air void and general construction performance of the reinstatement. This is being caused by:

- The need to make multiple trips to asphalt plants for different types of material
- Lack of availability of hot asphalt in the evening and at weekends
- Wasted time travelling twice a day to asphalt plants and waiting time to be served (this results in an average of four hours lost time a day)
- Small amounts of hot asphalt material being transported over long distances reduces the effective reinstatement temperature resulting in greater likely hood of air voids in the finished resurfacing and
- A high degree of waste at the end of the day as material becomes less usable.

Method(s)

The project will trial the use of emerging technology and materials for producing all types of asphalt locally at the work site in the required volume and mix for the job in hand, along with the durability of the mixed material to comply with the Specification for Reinstatements of Openings in Highways (SROH).

The main activities will be:

- Test material for compliance with the SROH, engaging Transport Research Laboratory (TRL)
- Carry out accelerated wear test
- Compare speed and cost effectiveness of 'RoadMender' equipment compared with existing methods of reinstatement
- Develop best transport method
- Compare end to end time to do work between existing and new processes
- Gauge customer satisfaction
- Gauge ease of use by reinstatement teams
- Development of an evaluation pro forma to assess the performance of each trialled replacement technique.
- Peer review undertaken of results with other DNOs.

This project will be carried out in two phases:

- Phase 1 – Material compliance at TRL.

The purpose of this phase will be to test the new material and method of mixing to ensure that it meets BS EN specification for the material and the requirements of the SROH, before full on highway trails are to take place.

- Phase 2 – On site trails and comparisons.

This second phase will only be carried out subject to successful outcome of the first phase. It will involve using the new equipment, material and process as part of day to day work delivery. Also in this phase the reliability, durability and cost effectiveness of the product and material will be evaluated.

Scope

The project aims to demonstrate alternative reinstatement technique to the traditional method so as to reduce process cycle time, waste and cost, whilst improving quality of reinstatement and customer satisfaction, within the three UK Power Networks DNO areas.

The project will:

- Prove the consistency of material type mixes against the appropriate BS EN standard
- Ensure that the material has the correct ware resistance
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Objective(s)

We are expecting that the use of RoadMender and the propriety reinstatement material, a polymer modified asphalt, will help in the reduction of road congestion, improve process cycle time to improve customer satisfaction, reduce pollution with less vehicle movements, whilst improving the quality of reinstatement and thus reducing the volume and cost of reinstatement failures.

Consumer Vulnerability Impact Assessment (RIIO-2 Projects Only)

n/a

Success Criteria

The following will be considered when assessing whether the project has been successful:

- Material compliance
- Speed of reinstatement versus conventional methods
- Compliance with SROH
- Cost benefit
- Process cycle time
- Number of days of disruption reduced

Project Partners and External Funding

n/a

Potential for New Learning

n/a

Scale of Project

The project will require the purchase of the specialist asphalt mixer and associated equipment along with the establishment of an internal reinstatement team to improve process cycle time and reduce cost. Trials are planned to involve the reinstatement of some c.1,500 excavations relating to all types of work types and asphalt materials. Prior to trials starting on the highway TRL will be asked to carry out tests on the material to ensure that it complies with existing BS EN requirements as well as SROH safety requirements for skid resistance and durability. Once work has been completed random sites will be selected for core testing to check for quality of reinstatement.

Following feedback at the mid-trial review it was identified that additional learning could be gained by extending the trial to test a second type of specialist asphalt mixer using an external funding source.

Technology Readiness at Start

TRL6 Large Scale

Technology Readiness at End

TRL8 Active Commissioning

Geographical Area

To prove the value and impact of using RoadMender and the polymer modified asphalt trial will be undertaken in UK Power Networks' SPN and LPN DNO areas, primarily within Kent, on excavations equal to or less than 2m2. The product will be used in a real world environment, the only criteria for reinstatement site will be the size of the reinstatement.

Revenue Allowed for the RIIO Settlement

The reinstatements in this project are likely to be from fault, planned replacement and new connections work. There is allowance for

reinstatements within fault costs and planned replacement costs within the RIIO settlement; however this project is only looking to fund from the NIA the costs for the testing, equipment, setup and development of the reinstatement work, activities not included in the RIIO settlement. The other labour and material costs will be covered within the works themselves, from the funds allocated in the RIIO settlement.

Indicative Total NIA Project Expenditure

The total project cost is £493,106. The total amount requested from NIA is £300,228, 61% of the estimated total project cost. The remaining amount is paid for by the jobs where reinstatements are carried out as part of this project. As discussed above funding is being sought from the TfL Lane Rental Scheme which, if received, will reduce the funding drawn from the NIA. This will not be confirmed until later in the project.

A high level cost breakdown is as follows:

- Labour - £36,400 - Project management and administration, document development, etc
- Materials - £63,090 - RoadMender machine and trailer, asphalt materials and sundry items.
- Contractors - £292,691 - Transport Research Laboratory (TRL), vehicle and reinstatement team hire, coring contractors
- Other - £100,925 – Consumables, travel & subsidence, allowance for reinstatement failures, and project contingency (10%)

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)

A comparison of the cost estimates indicates a saving based purely on the reduced cost to be approx. £35 per reinstatement. If this is approximated across all reinstatements less than 2m2 in LPN and SPN this is £260k per annum, across all three UK Power Networks' licence areas £440k per annum.

There are a number of factors that could reduce the potential savings, including but not limited to:

- The setup and equipment costs for rolling out this process could be higher than anticipated
- The lifetime of the equipment could be shorter than anticipated
- The material could last for less time than anticipated, despite the testing to ensure otherwise

There are a number of factors that could increase the potential savings, including but not limited to:

- There could be reduced lane rental charges for reinstating excavations more quickly
- There could be savings on charges for opening asphalt plants out of hours
- Increased flexibility on ground works could allow for savings in electrical work by providing project options not currently available.

Please provide a calculation of the expected benefits the Solution

The base cost for a reinstatement of a set size of small excavation in our current process is approx. £225. The method cost based on estimates of material required and costs from suppliers is £190.

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

Small reinstatements are carried out by electricity and gas distributors throughout GB by all Network Licensees or their contractors. As such the RoadMender method could be applied in all areas of GB.

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

The RoadMender material compliance with relevant standards would be proven so the only upfront costs would be around equipment purchase and training/process change.

If an assumption is made that work volumes per licence area are approximately equivalent to customer numbers then based on the

volumes in UK Power Networks' three areas across all 14 licence areas in GB this is approximately 53,000 work items with potential savings (not accounting for setup costs) of £1.9m per annum.

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

If successful, the learning can be shared with all DNOs and their contractors, who could procure the same materials and follow the processes developed as part 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)

This project supports the core of UK Power Networks Innovation Strategy, looking at improving fault performance by ensuring that we can complete work associated with fault repair as quickly and efficiently as possible. It fits within the "Develop commercial solutions and products" innovation capability theme that provides benefits to many areas of work on our HV and LV underground networks.

The project also supports the following areas of UK Power Network's vision:

- Sustainably cost efficient: through reducing the costs associated with reinstatement works following electrical works
- Employer of Choice: through more efficient and higher quality reinstatement works. Reduced time on site will lead to reduced risk of lost time incidents.
- Respected Corporate Citizen: by minimizing the duration our electrical work impacts on the travelling public

☑ 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