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

Dec 2013

Project Reference Number

NIA_NGET0079

Project Registration

Project Title

Rapid Deployment Ballistic Screens

Project Reference Number

NIA_NGET0079

Project Licensee(s)

National Grid Electricity Transmission

Project Start

July 2011

Project Duration

4 years and 9 months

Nominated Project Contact(s)

Graham Moss

Project Budget

£340,000.00

Summary

National Grid in the past has looked at the problem of screening from a very local viewpoint, and tended to rely on screening systems that are not capable of being easily transported, manoeuvred and put into the HV environment without outages, lifting equipment and substantial cost.

Nominated Contact Email Address(es)

box.NG.ETInnovation@nationalgrid.com

Problem Being Solved

The screening material under investigation is designed primarily to be completely effective in preventing all fragments of porcelain from a catastrophic failure at a distance of less than 10m. The system is designed to be modular, which means entire walls can be quickly assembled. The materials are to be extremely cost effective, relatively lightweight and will be designed to be easily fabricated to address several roles such as relay room protection, outer perimeter fence guards (for third party protection), window guards, safety ‘pathways’ through substations, wheeled screens for ‘asap’ coverage and emergency refuge shelters for those working within the substation, where travelling to a point of exit represents a danger in itself.

The materials employed will be able to be 80% recycled (post use) on our substations as trench covers, with the lightweight transparent armour plate being recycled through normal recycling channels. It is thought that only the main stay frame will be the only component that will require disposal or return to the manufacturer.

The entire system will be completed from non-conductive components, and assembled by Redman Composites, who currently are building blast protection screens for the enhanced security projects at many London substations. Due to the seriousness of the current situation, preliminary work has begun on the prototype design under the FMJL project budget. This will not cover construction of a full scale prototype and full testing at RADNOR.

Method(s)

Research & Development

The method that has been proposed for this project includes;

- The fabrication of the prototype screening module is due for completion and transport to RADNOR
- Full testing of all screening material combinations is expected, trial deployments of different screen types.
- The full array of screening materials should be produced and evaluated
- We want to be in a position to begin (if required) fabrication of large quantities.

Scope

National Grid in the past has looked at the problem of screening from a very local viewpoint, and tended to rely on screening systems that are not capable of being easily transported, manoeuvred and put into the HV environment without outages, lifting equipment and substantial cost.

Objective(s)

The objective of this project is to deliver a cheap, effective and easily deployed ballistic screening module that is easily capable of withstanding the resulting debris from a typical catastrophic failure of porcelain clad HV transmission asserts such as those seen in FMJL, FMVGs, SP2 breakers, bushings etc. It will be modular to cope with as small, or as large a deployment screen as required. Fully non-metal, it can be used within a live substation.

Consumer Vulnerability Impact Assessment (RIIO-2 Projects Only)

n/a

Success Criteria

This project is successful will be successful if we improve the knowledge around the materials ability to withstand three times the highest energy impacts seen in the controlled disruptive failures.

Project Partners and External Funding

n/a

Potential for New Learning

n/a

Scale of Project

This project is focussed on substation scale.

Technology Readiness at Start

TRL3 Proof of Concept

Technology Readiness at End

TRL8 Active Commissioning

Geographical Area

This project will provide tools and techniques applicable for the whole of the National Grid Transmission system.

Revenue Allowed for the RIIO Settlement

Zero

Indicative Total NIA Project Expenditure

IFI £150,000.

NIA expenditure is £190,000

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)

This project will help to provide alternatives to hazard zones in specific situations and as such will reduce the impact of hazard zones on system operability and increase access for maintenance.

An estimate of one saved life is £1.5 million.

Please provide a calculation of the expected benefits the Solution

Research Project - Not required.

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

This screen can be rolled out across all National Grid sites.

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

This is unknown at the moment. Updates will follow when applicable.

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

n/a

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 addresses the safety theme in the innovation strategy, providing a new option for safe working in many situations.

☑ 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