

## NIA Project Registration and PEA Document

### Date of Submission

Mar 2013

### Project Reference

## Project Registration

### Project Title

Polymeric Insulation Evaluation

### Project Reference

### Project Licensee(s)

National Grid Electricity System Operator

### Project Start

January 001

### Project Duration

0 years and 1 month

### Nominated Project Contact(s)

National Grid TO Innovation Team

### Project Budget

£55,000.00

## Summary

Traditionally ceramic insulation has been used for all substation devices required to provide High Voltage (HV) conductor to ground insulation clearance. Examples are Current Transformers (CTs), Voltage Transformers (VTs), Bushings and Post Insulators which use a special shed profile to optimise on size, strength, 'creepage' and provide weather and pollution resilience. This technology is well proven, reliable with a predictable life and has been used for over 50 years. However these devices can fail catastrophically and unexpectedly and cause serious injury and collateral damage to other plant and equipment. In addition they are heavy and susceptible to damage during manufacture, transport and installation phases and require larger civil foundations and structures to support them than those made from lighter materials.

Polymeric insulation is now a viable alternative to ceramic insulation and there is growing adoption and experience in other utilities. However there are a number of choices on the market, particularly relating to material, shed profile and manufacturing processes. There is also uncertainty over the mechanical strength, proven life, maintenance needs and performance over time.

This project will engage NAREC (NDSL) to carry out a technical survey, evaluate and report on the choices available and provide recommendations for optimum selection. This will enable National Grid to risk manage the introduction of polymeric insulation into main projects. This work will also include a market study to examine the worldwide experience of major utilities in the use or trial of polymeric insulators on post type current transformers in substation applications.

### Nominated Contact Email Address(es)

box.so.innovation@nationalgrid.com

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**Problem Being Solved****Method(s)****Scope****Objective(s)**

This R&D Project aims to gain an understanding of the technical performance and market experience of the material compounds available, preferred manufacturing process and optimum choice of shed profiles for polymeric insulation systems. This will enable clear policy and specifications to be established for the future application of polymeric insulation in substation applications such as Instrument Transformers. This will form part of the risk management process for the introduction of this new technology into replacement and new build substation projects

**Consumer Vulnerability Impact Assessment (RIIO-2 Projects Only)**

n/a

**Success Criteria**

n/a

**Project Partners and External Funding**

n/a

**Potential for New Learning**

n/a

**Scale of Project**

n/a

**Geographical Area****Revenue Allowed for the RIIO Settlement****Indicative Total NIA Project Expenditure**

## 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)

n/a

#### Please provide a calculation of the expected benefits the Solution

n/a

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

n/a

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

n/a

### 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)**

n/a

- Has the Potential to Develop Learning That Can be Applied by all Relevant Network Licensees

**Is the default IPR position being applied?**

- Yes

**Please demonstrate how the learning from the project can be successfully disseminated to Network Licensees and other interested parties.**

**Please describe how many potential constraints or costs caused, or resulting from the imposed IPR arrangements.<**

**Please justify why the proposed IPR arrangements provide value for money for customers.**

## 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