

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

Apr 2013

### Project Reference Number

IFIT\_2008\_05

## Project Registration

### Project Title

Tower Loading Risk Assessment

### Project Reference Number

IFIT\_2008\_05

### Project Licensee(s)

Scottish and Southern Electricity Networks Transmission

### Project Start

April 2005

### Project Duration

5 years and 0 months

### Nominated Project Contact(s)

SSEN Future Networks Team

### Project Budget

£267,429.00

## Summary

Corrosion of steelwork in tower foundations has been a concern for some time as many steel overhead towers are more than fifty years old. The project will investigate the use of non-intrusive techniques to ascertain the strength and integrity of both underground steel and concrete components of the tower foundations of a representative sample of the Scottish and Southern overhead power distribution network.

The investigation will be undertaken on the foundations of approximately 120 overhead towers to assess the feasibility of two complimentary techniques.

Polarisation Resistance Measurements to obtain an instantaneous value of the steel foundation corrosion rate that is based on the consideration of the electromechanical mechanisms involved in corrosion. These measurements will provide information on the state of the tower foundations and aid in identifying foundations that are most likely to have suffered significant corrosion damage.

Transient Dynamic Response to assess the integrity of both pre-cast and cast in situ concrete piles and foundations. The method is based on measuring the frequency and amplitude response of a concrete foundation based on an impulse wave being passed through it. The response contains information which is related to the integrity of the concrete foundation.

The Transient Dynamic Response techniques have not been used by UK DNO companies to assess tower foundations, but other types of business have found them to be useful for assessing concrete foundations.

### Nominated Contact Email Address(es)

transmissioninnovation@sse.com

## Problem Being Solved

### Method(s)

## Scope

### Objective(s)

The project objectives are:

- To undertake an initial investigation of 120 overhead tower lines using both techniques
- To assess the feasibility and benefits of using this approach to assess all overhead tower assets
- To analyse the data gained from the site surveys to provide a subset of towers where further investigation is recommended
- To undertake witnessing of tower foundation excavation works where further investigation is recommended
- To provide an assessment of the viability and effectiveness of the use of non-invasive assessments of tower foundations using Polarisation.

### 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