

NIA Project Registration and PEA Document

Date of Submission

Nov 2014

Project Reference Number

SSEEN02

Project Registration

Project Title

Modular Approach to Substation Construction (MASC)

Project Reference Number

SSEEN02

Project Licensee(s)

Scottish and Southern Electricity Networks Transmission

Project Start

January 2015

Project Duration

4 years and 6 months

Nominated Project Contact(s)

Frank Clifton, Project Development Manager.
(frank.clifton@sse.com)

Project Budget

£3,263,000.00

Summary

SHE Transmission proposes to demonstrate and deploy a permanent substation designed using a Modular Approach to Substation Construction (MASC). The current approach to substation construction differs little from that of 60 years ago; meanwhile many innovations in design and civil engineering could create a substation which is cheaper, faster to deploy and more suited to GB's low carbon energy future. MASC seeks to prove the following benefits:

- Faster deployment: MASC maximises off-site construction so that timescales associated with extensive, on-site civil engineering works are shorter.
- Improved whole life asset value: MASC substations could offer up to 20% savings over an asset's whole life, compared to conventional builds. This equates to £151m to £655m savings across the GB transmission network.
- Increased flexibility for network configuration: MASC capacity can be easily modified to suit changes in generation plant capacity.
- Improved environmental impact: MASC's smaller geographical footprint and off-site construction ensure improvements in visual amenity and less disruption to local communities, wildlife and land.

The project is expected to last for approximately five years, providing incremental learning and new standards in substation design and operation. Two innovative learning tools will be introduced through the project; a MASC 3-D Virtual Simulation Tool and a MASC Decision Tool. NIC funding is sought to cover only the additional costs of demonstrating MASC for the first time.

Preceding Projects

NIA_SHET_0013 - Modular Approach to Substation Construction - Design Development

Nominated Contact Email Address(es)

transmissioninnovation@sse.com

Problem Being Solved

Method(s)

Scope

Objective(s)

SHE Transmission are planning to build a significant number of new substations between now and 2026, which are necessary to:

- Facilitate the connection of renewable energy generation, and
- Expand and reinforce the network to create infrastructure which accommodates necessary extra capacity.

The objective of this NIC project is to build, deploy and demonstrate a new, permanent substation using a Modular Approach to Substation Construction (MASC). The NIC funding request covers the additional costs of deploying a MASC substation for the first time; the actual substation project cost will be covered using the industry's established commercial mechanisms for connections.

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 RII0-1 and RII0-2 NIA projects. This is noted in each case, with the requirement numbers listed for both where they differ (shown as RII0-2 / RII0-1).

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 RII0-2 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 (RII0-1 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 RII0-1 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

RII0-2 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