

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 2014

Project Reference Number

NIA_SPT_1300

Project Registration

Project Title

NIC Proposal Development

Project Reference Number

NIA_SPT_1300

Project Licensee(s)

SP Energy Networks Transmission

Project Start

June 2013

Project Duration

0 years and 10 months

Nominated Project Contact(s)

James Yu (Future Networks Manager)

Project Budget

£175,000.00

Summary

Develop project delivery strategy and provide project management support (This would include but not be limited to maintaining an overall project plan including key milestones and main activities. Develop a risk register. Identify constraints and mitigation to ensure success). Summary reports shall be prepared at weekly intervals to identify progress and corrective actions.

Tenderers shall define their level of support in this area and how all those involved in the project will be able to participate in viewing and informing current project (eg Developing the overall master plan by adding new activities as they become apparent or revising the duration and progress of tasks in the plan).

The tender shall include a high level project plan showing their suggested timescales for phases 1 to 4.

Nominated Contact Email Address(es)

innovate@spenergynetworks.co.uk

Problem Being Solved

The VISOR project has been selected for promotion by SPT since it provides innovation to complement and underpin the technology integration challenge, promoting the acceleration of a low carbon energy sector and creating knowledge that will benefit all TO's, OFTO's and DNO's investing in new technologies. This project further provides the most effective compliance with the criteria cited Section 4.9 of the NIC Governance document and delivers an industry need in a timely manner.

In order to meet government energy policy, TOs are investing heavily in system upgrades, some of which deploy new technologies, i.e. embedded HVDC links and Series Compensation etc. The commissioning of these technologies on the GB transmission system leads to a finite risk of unforeseen and potentially damaging oscillatory interaction between transmission and generation plant and this may also impact on security of supply, if not appropriately managed.

SP and NGT have previously installed Phase Measurement Units (PMU) that monitor system dynamic behaviour but this system has significant shortfalls in capability, i.e. it can only see oscillatory behaviours up to about 10Hz whereas new technologies may exhibit behaviours at higher frequencies up to the nominal system frequency i.e 50Hz. The current installed system provides no means of identifying the location or source of a disturbance.

The existing planning and operation of the transmission system is based heavily on off-line deterministic studies and there are few opportunities to validate the results of the model against the real system performance. The provision of PMU data enables the network impedance to be accurately measured and the performance of dynamic models to be validated.

The transmission boundary between Scotland and England is heavily constrained by voltage and stability limits. Stability limits are normally assessed by off-line study with the application of appropriate operational margins. There is currently no facility to use the real time system data to establish operational limits.

Method(s)

This proposal will build on the existing PMU infrastructure installed in NGT and SPT network and will address the short falls in the performance and functionality of PMU based processing, to provide a “fit for purpose” monitoring system for the future GB transmission system.

The system developed will be a hybrid to accommodate conventional PMU’s and high resolution frequency analysis devices capable of recording the higher frequency disturbances that may be expected from new technologies in the future. The project will develop additional functions to enable the source of a disturbance to be identified.

PMU data can also be used to validate network models for network investment planning purposes.

The project will identify the optimum coverage and location of PMU sources taking into account the system requirements such as network topology visibility to assist with black start recovery and the communication infrastructure requirements for data transmission.

Having acquired a GB wide picture of PMU data, this may be used in conjunction with other conventional power flow information, to provide a hybrid state estimation of “near real time” state variables. These state variables will be used with an analysis platform to derive real time voltage and stability limits. This shall facilitate real time dispatch and allow the full network capabilities to be used, whilst managing the risks identified in Section 2.1.

In the first instance, the project will establish a trial focused on the Anglo-Scottish transmission boundary (also known as B6) which is frequently power flow constrained, as a result of active system stability and voltage limits.

Scope

Develop project delivery strategy and provide project management support (This would include but not be limited to maintaining an overall project plan including key milestones and main activities. Develop a risk register. Identify constraints and mitigation to ensure success). Summary reports shall be prepared at weekly intervals to identify progress and corrective actions.

Tenderers shall define their level of support in this area and how all those involved in the project will be able to participate in viewing and informing current project (eg Developing the overall master plan by adding new activities as they become apparent or revising the duration and progress of tasks in the plan).

The tender shall include a high level project plan showing their suggested timescales for phases 1 to 4.

Objective(s)

To develop a full research and demonstration proposal under NIC mechanism for Ofgem and the Expert Panel to evaluate.

Consumer Vulnerability Impact Assessment (RIIO-2 Projects Only)

n/a

Success Criteria

To further develop, independent evaluate the existing proposal and fulfill the requirements set out under the NIC governance document

Project Partners and External Funding

n/a

Potential for New Learning

n/a

Scale of Project

Deliverables expected:

- On-time delivery of the full proposal
- Clear and robust support documents regarding Resources and Programme
- Presentation of results

Timely and effective support in the potential TQ period with Ofgem, following the submission in August, 2013.

Technology Readiness at Start

TRL2 Invention and Research

Technology Readiness at End

TRL6 Large Scale

Geographical Area

Applicable to UK and international transmission networks through technical expert interaction.

Revenue Allowed for the RIIO Settlement

Not applicable.

Indicative Total NIA Project Expenditure

Total expenditure for the full proposal development is £175,000 or less in line with the NIC governance document

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)

- Potential increment of 50MW of boundary capacity
- Potential delay of Investment Need for the boundary reinforcement in the order of £8m
- Potential reduction of constraint cost in the order of multi million per year

Please provide a calculation of the expected benefits the Solution

Research therefore N/A

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

Learning has been agreed to be disseminated in conjunction with Ofgem website, ENA website, Scottish Power Website and annual conferences (including LCNF).

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

N/A, learning via business as usual.

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

The control and communication philosophy developed under this project will be applicable to any transmission network boundaries with dynamic constraint.

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

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