

NIA Project Registration and PEA Document

Date of Submission

Mar 2013

Project Reference Number

Project Registration

Project Title

ESO Future Transmission System Stability Analysis

Project Reference Number

Project Licensee(s)

National Energy System Operator

Project Start

September 2011

Project Duration

0 years and 5 months

Nominated Project Contact(s)

National Grid TO Innovation Team

Project Budget

£69,000.00

Summary

Between 2011 and 2017, it is anticipated that the installed wind generation capacity in the National Grid transmission network will increase from 1877MW to 8671MW. Together with changes to the network topology, this increase will have a substantial influence on stability constraint boundary flow limits in the National Grid system. The studies will look at the network configuration of the following study years and base cases:

- Year 2010/2011: minimum and maximum load profiles
- Year 2014: minimum and maximum load profiles
- Year 2017: minimum and maximum load profiles.

The studies will be based on one network topology per study year (the analysis of different network schemes is out of the scope of the studies). The generation profiles and planned network expansions of these years will be obtained from the National Grid Seven Year Statement (SYS) 2011.

The feasibility study will illustrate the potential of a tool for system operation and improve our operator capability in the ENCC and hence enable the transmission system to be operated more efficiently and less risk adverse as the rate of decarbonisation increases going forward. Such a capability isn't currently available; hence the development and implementation will be a first for National Grid delivering an innovative solution in this area, into production within the ENCC.

Nominated Contact Email Address(es)

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Problem Being Solved

Method(s)

Scope

Objective(s)

As the UK moves towards a decarbonised energy sector, there is an increase in the scale and volatility of power flows on the power system expected, this is predominately due to the increased percentage of renewable [intermittent] generation. 15GW by 2015 and 30GW by 2020. This analysis will focus on system stability, specifically caused by the large network flow changes at periods of low demand when a high proportion of synchronised generation is being generated from renewable sources [offshore wind]. The analysis is going to focus on voltage stability but will also include transient and dynamic system stability. DigSilent will produce an independent report with the support from National Grid experts in modelling system stability, and generator dynamic performance, using the current off-line model and making approximations of future system conditions. The analysis will detail system wide conditions and specific boundary issues as defined by National Grid Engineers.

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