national gas transmission

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

Feb 2014

Project Reference Number

NIA_NGGT0023

Project Registration

Project Title

Development of "AGI safe"

Project Reference Number

NIA_NGGT0023

Project Licensee(s)

National Gas Transmission PLC

Project Start

February 2014

Project Duration

2 years and 7 months

Nominated Project Contact(s)

Neil Jackson, David Mccollum,
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Project Budget

£246,333.00

Summary

National Grid is required under the Pipeline Safety Regulations to manage the risks associated with the high pressure transmission pipeline network to a level which is "As Low As Reasonably Practicable" (ALARP). The AGI Safe (previously developed as "CompCab" under the IFI project " Risk Methodologies) package is used by National Grid to perform quantitative risk assessments (QRAs) of a wide range of existing or proposed above-ground high pressure gas installations, including compressor sites, pressure reduction stations, offtakes, in order to prioritise safety expenditure and demonstrate compliance. A number of improvements and extensions to the functionality of the package has been identified and will be developed as part of this scope:

1. Modelling of pipework in pits which gives improved functionality and a more realistic model.

2. Creation of a module to model on site above ground pipework. This will allow site Emergency Shut Down to be taken into account using generic assumptions.

3. Provision for modelling 'L' shaped pipework areas.

4. Allowing for a greater aspect ratio to model long, thin sections of pipework, currently limited to an aspect ratio of 10 (length can be a maximum of 10 times the width of the block).

5. Automatic generation of escalation matrices for thermal radiation to allow modelling of the most cost effective means of fire protection.

6. Provision for User defined wind rose so that assessments can take into account local wind patterns across the UK

Also included will be various automation aspects to allow for greater efficiency including automation of the 'Internal Leaks QRA module' with the 'Main Site QRA module' so that the internal leaks do not have to be run as separate scenarios and then be manually added to the risk results database by the user, and provision of a 'copy site' function whereby a current site in the database can be duplicated so that the User can edit the duplicated site without changing database information for the current site.

Third Party Collaborators

DNV

Nominated Contact Email Address(es)

Box.GT.Innovation@nationalgrid.com

Problem Being Solved

The continuous management and improvement of safety risks on high pressures gas installations requires ongoing research and development of new tools and techniques, development of wide ranging models and procedures. As physical innovation ideas are developed to increase safety or reduce cost, there is a need to consider the effects these ideas have on the site risk profile. Current risk models are time consuming to run to consider changes in site layout or addition of safety features. The project looks to build on from an existing tool to develop major enhancements including risk assessment modelling of pipework in pits and creation of a module to model above ground pipework in a more realistic way to take account of safety protective features.

Method(s)

The agreed deliverables as are as follows:

1. Interim release of AGISafe package

2. Final release of new version of AGISafe package

The change requirements for this project have necessitated an increase in the overall budget of £113,000. Additional costs are to deliver the following improvements and extensions to the functionality of the package for the final release. They have been identified during the project work to date and will be developed by the innovation partner. These improvements are in the five categories as follows:

1. Failure of Equipment - This will allow for the automatic investigation of escalation potential from an event on one pipe-work section impacting on the adjacent pipe-work. It will address current issues and limitations with both the software and existing modelling assumption.

2. Escalation Matrix on Targets - This work is required in order to meet key policy requirements in order to undertake compressor station site Fire Risk Assessment (albeit it could be utilised for all types of AGI's). It will allow the more detailed risk evaluation of potential risks of escalation to people and plant. Its output will additionally allow for a more detailed assessment of issues arising from T/SP/G/37 non-compliance (Specification for Site Location and Layout Studies and Reviews) than possible previously.

3. Exceedance and Other Contours - The need to develop additional exceedance curves for location specific risks, and ascertain required volumes of fire water needed; is a key requirement of the required Fire Risk Assessments (as per T/SP/SFP/1 and T/PM/SFP/5). This work is also a key requirement, in terms of future asset health work, in order to ensure that the sitting of temporary buildings is in a location that minimises any additional risk to those who might be exposed from an incident.

4. Stand Alone Tasks - To improve the functionality and usability of the software, to link differing software interdependencies together in the automatic generation of results (currently a very labour intensive task), to allow the hazards from the closed pits to more appropriately modelled and to allow for easier 'copy' and 'paste' type facility (to import information from differing site / equipment set-ups).

5. Training and User Guidance - Development of a training course for use of the final release of AGI Safe including the above improvements and application of AGI Safe in a practical AGI assessment.

Scope

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Objective(s)

To develop an enhanced risk assessment model for above ground installations.

Consumer Vulnerability Impact Assessment (RIIO-2 Projects Only)

n/a

Success Criteria

The delivery of a fully functional tool "AGI safe".

Project Partners and External Funding

n/a

Potential for New Learning

n/a

Scale of Project

The tool needs to be of sufficient scale for the applicability across gas transmission and distribution above ground installations.

Technology Readiness at Start

TRL4 Bench Scale Research

Technology Readiness at End

TRL7 Inactive Commissioning

Geographical Area

The project will be desk based software development.

Revenue Allowed for the RIIO Settlement

None

Indicative Total NIA Project Expenditure

Total Expenditure - £246,333

The change requirements will deliver Transmission innovation and will be funded 100% by National Grid Gas Transmission.

Gas Transmission NIA internal expenditure - £16,667

Gas Transmission NIA external expenditure - £50,000

Gas Distribution NIA internal expenditure - £16,667

Gas Distribution NIA external expenditure - £50,000

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)

The AGIsafe tool will be a design tool to minimise the safety impact of installations to the public at the design stage. AGIs are a bespoke design in terms of layout and safety protective features such as fire protection and shutdown arrangements each new site or modification to a site has to be considered individually. National Grid has a legal requirement to ensure that new designs are ALARP i.e. that safety protective features are cost effective. This tool will provide increased focus on our customers' requirement to provide a safe network cost effectively.

Please provide a calculation of the expected benefits the Solution

On a high pressure gas installation, a congested layout is more hazardous than one with space and large distance between buildings and equipment. However it can be prohibitively costly to increase the size of the site footprint. Amongst other things a tool such as AGIsafe can drive optimum expenditure on safety protection features, such as blast walls and fire protection. National Grid will look to complete a number of new build projects and site upgrades on transmission and distribution sites over the RIIO T1 period for which this process for optimizing safety can be applied:

Cost of additional land plus fencing – £70,000 per site

Cost of blast walls and fire protection features – £20,000 per site

Total savings if applied to 5 National Grid sites - £50,000 x 5 = 250,000

Fundamentally the project contributes to reducing the risk of injury to both employees and staff, of operation of the high pressure gas network.

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

The project would be of relevance to both gas transmission and distribution companies with above ground installations.

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

The tool would be developed to contain National Grid specific information and there would be no additional cost to roll out.

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)

The project is aligned the Safety theme within the innovation strategy.

☑ 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