

NIA Project Registration and PEA Document

Date of Submission

Sep 2022

Project Reference Number

NIA2_SGN0029

Project Registration

Project Title

SR25 Calculator update

Project Reference Number

NIA2_SGN0029

Project Licensee(s)

SGN

Project Start

September 2022

Project Duration

0 years and 4 months

Nominated Project Contact(s)

Alexander Webb

Project Budget

£47,600.00

Summary

The current version of the Technical Standard IGEM/SR/25 Edition 2 covers Hazardous Area Classification of Natural Gas Installations and includes a hazardous area classification calculator. The calculator, based on a Microsoft Excel spreadsheet program, implements the IGEM/SR/25 Edition 2 standard methodology.

This project covers the update of the hazardous area classification calculator to incorporate the methodology in the IGEM/SR/25 Supplement to allow the calculator to be used for hydrogen and blends.

Third Party Collaborators

Institution of Gas Engineers and Managers

Nominated Contact Email Address(es)

sgn.innovation@sgn.co.uk

Problem Being Solved

DNV are in the process of working with IGEM and HSE to publish a Supplement to IGEM/SR/25 which covers hydrogen and hydrogen blends up to and including 20% hydrogen in natural gas by volume.

The current version of the Technical Standard IGEM/SR/25 Edition 2 covers Hazardous Area Classification of Natural Gas Installations and includes a hazardous area classification calculator. The calculator, based on a Microsoft Excel spreadsheet program, implements

the IGEM/SR/25 Edition 2 standard methodology.

This project covers the update of the hazardous area classification calculator to incorporate the methodology in the IGEM/SR/25 Supplement to allow the calculator to be used for hydrogen and blends.

Method(s)

The main features of the package include:

- Modules: Modules for calculations of hazardous areas for - Buildings, Vents, Multi-Venting, Outdoors.
- GUI: The Graphical User Interface will remain similar to that of the current tool. However, improvements may be introduced if dictated by ergonomic considerations or more robust implementation of the methodology logic.
- Data files: The calculator makes extensive use of pre-computed results, which are included as tables in the Excel spreadsheet.
- Save/Load facilities
- Output: results are written to pre-existing templates in the spreadsheet, also containing explanatory diagrams.
- On-line help

Each module of the package will be thoroughly tested and validated against the existing tool for cases where the methodology has not changed or against manual calculations otherwise. The tool will be developed for Microsoft Excel Office 365 (current version used for the Natural Gas SR/25 calculator). No guarantee of compatibility with other versions of Excel can be offered by DNV.

Scope

It is envisaged that the development of the software will involve the following tasks:

Task 1 - Package specification: This task will involve reviewing the IGEM/SR/25 Supplement and liaising with IGEM and/or DNV staff in order to define the details of the updated methodology and the user requirements for the package interface. It is expected that this process will be carried out in parallel with the development work.

Task 2 – Software update: The software code for the following modules within the calculator will be checked and compared against the Supplement to confirm where changes are required and these changes will be implemented:

- Buildings,
- Vents,
- Multi-Venting,
- Outdoors.

In line with some sections of the Supplement, it is anticipated that additional code will need to be added to the calculator to deal with situations where there are different fuel types involved such that the calculations are undertaken for all fuel types and the worst case selected.

There is also a requirement to add lookup tables for hydrogen and blends which are equivalent to the tables contained within the existing calculator for natural gas.

The user interface will also be updated to reflect the requirement for the user to select between natural gas, hydrogen and blends. One calculator will be used to contain the results for each of the three fuel types.

The existing system of informative messages on the methodology will be retained and possibly augmented with new information, when appropriate.

Task 3 - In-house Testing: All logical pathways through the package will be tested against existing tool (if possible) or manual calculations.

Task 4 – Evaluation by IGEM: Once in-house testing has been completed, the prototype version of the tool will be issued to IGEM for evaluation and comment.

Task 5 – Finalise Tool and Handover: A final version of the tool will be prepared following receipt of any comments resulting from IGEM's evaluation. The final version will be issued to IGEM for onward distribution to the project sponsors

Objective(s)

The objective of this project is to update of an existing hazardous area classification calculator to incorporate the methodology in the IGEN/SR/25 Supplement to allow the calculator to be used for hydrogen and blends.

Consumer Vulnerability Impact Assessment (RIIO-2 Projects Only)

N/A

Success Criteria

The criteria for success in the project is an updated hazardous area classification calculator that incorporates the methodology in the IGEN/SR/25 Supplement and allows the calculator to be used for hydrogen and blends.

Project Partners and External Funding

The calculator is proposed to be funded via IGEN by SGN.

Potential for New Learning

The output of this project will be an updated hazardous area classification calculator that incorporates the methodology in the IGEN/SR/25 Supplement and allows the calculator to be used for hydrogen and blends. The calculator will be available for use by all GB GDNs.

Scale of Project

This project is a small scale, desktop study that will produce a updated hazardous area classification calculator that incorporates the methodology in the IGEN/SR/25 Supplement and allows the calculator to be used for hydrogen and blends.

Technology Readiness at Start

TRL3 Proof of Concept

Technology Readiness at End

TRL4 Bench Scale Research

Geographical Area

The updated calculator developed through this project will be useable across GB.

Revenue Allowed for the RIIO Settlement

N/A

Indicative Total NIA Project Expenditure

External cost: £47,600

Internal cost: £15,866

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:

IGEM/SR/25 provides detailed requirements of the Hazard Area Classification of permanent and temporary natural gas installations. The SR/25 calculator a key aid to zoning to compliment the standard and must be updated to incorporate hydrogen and hydrogen blends.

This has been identified is a critical piece of work required before site assessments following on from SGN's Hytechnical project.

Failure to update this tool leaves a gap in the implementation IGEM/SR/25 standard for hydrogen and hydrogen blends.

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

The SR/25 calculator a key aid to zoning to compliment the standard and must be updated to incorporate hydrogen and hydrogen blends.

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.

The SR/25 calculator a key aid to zoning to compliment the standard and must be updated to incorporate hydrogen and hydrogen blends. The calculator will be applicable across GB.

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

RIO-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

IGEM/SR/25 provides detailed requirements of the Hazard Area Classification of permanent and temporary natural gas installations. The SR/25 calculator a key aid to zoning to compliment the standard and must be updated to incorporate hydrogen and hydrogen blends.

This has been identified is a critical piece of work required before site assessments following on from SGN's Hytechnical project.

Failure to update this tool leaves a gap in the implementation IGEM/SR/25 standard for hydrogen and hydrogen blends

Or, please describe what specific challenge identified in the Network Licensee's innovation strategy that is being addressed by the project (RIO-1 only)

N/A

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.

The scope has been reviewed against all existing projects and no areas of duplications have been identified.

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

IGEM/SR/25 provides detailed requirements of the Hazard Area Classification of permanent and temporary natural gas installations. The SR/25 calculator a key aid to zoning to compliment the standard and must be updated to incorporate hydrogen and hydrogen blends.

This has been identified is a critical piece of work required before site assessments following on from SGN's Hytechnical project.

Failure to update this tool leaves a gap in the implementation IGEM/SR/25 standard for hydrogen and hydrogen blends

Relevant Foreground IPR

The output of this project will be an updated hazardous area classification calculator that incorporates the methodology in the IGEM/SR/25 Supplement and allows the calculator to be used for hydrogen and blends. The calculator will be available for use by all GB GDNs.

Data Access Details

Any relevant data can be accessed by contacting the project manager

Please identify why the Network Licensees will not fund the project as apart of it's business and usual activities

The project is carrying out research and development on an emerging technology. This technology is at a low technology readiness level and as such it is not part of the usual activities of the business.

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

The NIA framework offers a robust, open framework to support this work and ensures the results are disseminated to all licenses. The project will improve understanding of the IGEM/SR/25 standard for hydrogen and hydrogen blends.

This project has been approved by a senior member of staff

☒ Yes