

NIA Project Registration and PEA Document

Date of Submission

Dec 2019

Project Reference Number

NIA_NGN_250

Project Registration

Project Title

Health and Safety Monitor – Phase Two

Project Reference Number

NIA_NGN_250

Project Licensee(s)

Northern Gas Networks

Project Start

December 2019

Project Duration

2 years and 4 months

Nominated Project Contact(s)

Shannon Telfer

Project Budget

£298,836.00

Summary

There are no current automated systems for monitoring and recording an individual's exposure to long-term health risks throughout the working day. Exposure to vibration and noise can all result in long-term ill-health and incapacitation as well as compensation claims for the employer.

This project proposes to implement 20 operational Active PPE monitors with complete system integration to achieve effective monitoring for vibration and noise exposure.

Third Party Collaborators

J3LLYH34D 1NDU5TR135 Limited

Nominated Contact Email Address(es)

innovation@northerngas.co.uk

Problem Being Solved

There are no current automated systems for monitoring and recording an individual's exposure to long-term health risks throughout the working day. Exposure to vibration and noise can all result in long-term ill-health and incapacitation as well as compensation claims for the employer.

The Health and Safety at Work etc. Act 1974 (Act 1974) is the primary piece of legislation covering occupational health and safety in Great Britain. The Health and Safety Executive, with local authorities (and other enforcing authorities) is responsible for enforcing the Act and a number of other Acts and Statutory Instruments relevant to the working environment.

Act 1974 states 'It shall be the duty of every employer to ensure, so far as is reasonably practicable, the health, safety and welfare at work of all his employees.'

All workers have a right to work in places where risks to their health and safety are properly controlled. Monitoring working conditions for noise and vibration will help workers to stay safe and employers to reduce both sick days and compensation payments.

Method(s)

This project is the second phase of a two-phase project. The first phase, conducted in 2017-2018 was considered a success, proving the technology viability up to TRL 6. Built on learning from an already developed Thermal alarm (Thermalarm), used by the fire service to manage heat exposure to individual fire fighters, the project delivered a working prototype, capable of accurately identifying individual exposure to Noise and HAV's. This was 'packaged' in the form of a PPE watch, containing several sensors.

Phase two of the project will refine the prototype functionality of the PPE watch, develop the necessary reporting and alert systems; and the required supporting infrastructure, before undertaking a testing regime. Therefore, ensuring the health and safety monitor can withstand the requirements of the operational environment.

The project will be delivered in three stages:

Stage 1 – Define the final device, portal and service expectations/specification.

Stage 2 - Refine the Hardware, Software and Service Development of 2nd generation 'beta' system and integrate with NGN data-stream.

Stage 3 – Perform testing and assurance activities in a 'live' operational environment.

Scope

The project will deliver updated functionality, second generation hardware and a secure infrastructure with "web" reporting to deliver a 'beta' pre-production service. The wearable sensor will support HAVS and SPL measurement. For the wearer, the system is real-time, providing warnings and alerts live "on the wrist". Once synchronised with the central repository, analysed data is viewable in graphical/table form over a secure "web" front-end.

Objective(s)

- Develop 20 fully operational Active PPE devices, capable of effectively automating the collection and processing of noise & vibration exposure data.
- Produce a web-based portal which uses the automated data collection to provide reports of under/over exposure and trends, complete with proactive alerts to nominated Northern Gas Networks Colleagues.
- Provide a level of technical confidence that the Active PPE Device will be fully integrated with Northern Gas Networks infrastructure through UAT and identified assurance activities.

Consumer Vulnerability Impact Assessment (RIIO-2 Projects Only)

n/a

Success Criteria

- Demonstrate an HSE compliant secure record of HAVS and SPL exposure per service user, through a secure "web" front-end with graphical representation of data and user/team/administration granular access.
- Achieve ISO standard for HAVS (vibration) and SPL (noise) measurement.
- Must quickly and concisely visualise per user exposure to noise and HAVS sources
- Must replicate processed data with HAVS and noise SPL measurements per user
- Demonstrate alerting, analysis and reporting of exposure through secure "web" front-end
- Deliver secure NGN data-stream for NGN proprietary systems

Project Partners and External Funding

Northern Gas Networks and j3llyh34d Industries Limited.

Potential for New Learning

The project will answer the question of whether the legal duty of managing Noise and HAV's exposure to operational colleagues can be efficiently and effectively achieved through automation. Therefore, improving health and wellbeing of colleagues and as a direct by-product, avoid future associated litigation claims.

Scale of Project

The project will develop; 20 fully functional PPE devices and supporting infrastructure to carryout 'live' end to end trialing and testing in a 'local' operational environment. The trialing and testing will involve 20 operational colleagues and representatives from the Health and Safety Management Team and be limited to the Teesside area.

The scale of the project is reflective of the minimum requirements to demonstrate and gain assurance, such that the product is effective in an operational environment.

Technology Readiness at Start

TRL6 Large Scale

Technology Readiness at End

TRL8 Active Commissioning

Geographical Area

The project will be constrained to 20 operational users in the Teesside area. However, the successful outcome as the potential to be deployed globally, far beyond the UK and GDN's.

Revenue Allowed for the RIIO Settlement

N/A

Indicative Total NIA Project Expenditure

External Costs - £270,000

Internal Costs - £28,836

Total Costs - £298,836

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)

The core benefits of this project are centered on the impact to society. It is estimated the project will deliver £390k a year of societal benefits through avoided personal injuries associated with noise and HAV's. However, through efficiencies gleaned from system automation, it is expected the initiative can be implemented on a cost neutral basis, whilst improving the wellbeing of colleagues and increasing social responsibility.

Please provide a calculation of the expected benefits the Solution

It is estimated the project will deliver £390k a year of societal benefits through avoided personal injuries associated with noise and HAV's. The figure is based on government statistics of slight minor injury costs.

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

The challenge being addressed by the solution is applicable to all GDN's and therefore could be readily adopted across the GB gas network.

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

Devices and management services over 3 years— Circa £2 million across GB gas network

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

All GDN's have a legal requirement to manage Noise and HAV's. No such system currently exists to automate and therefore improve the overall management of this requirements. As a result, the learnings from this project can be directly applied to each network's safety management practices.

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.

No current solution exists to automate the management of personal Noise and HAV's exposure

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

The principle idea of the project was taken from the fire service to address the challenge of achieving an automated system, that can offer increased efficiency and effectiveness, comparatively against the existing manual system. No such system for automating the management of Noise and HAV's currently exists.

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

The uncertainty associated with the solutions performance in a 'live' operational environment and therefore demonstrate HSE compliance, is considered beyond NGN's risk appetite at the specified level of investment to progress as a business as usual activity.

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 uncertainty of the technical performance of the solution presents a commercial risk to NGN, that would be beyond its current risk appetite.

This project has been approved by a senior member of staff

☒ Yes