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

Sep 2015

Project Reference Number

NIA_NGGD0064

Project Registration

Project Title

Mobile Virtual Reality Modelling

Project Reference Number

NIA_NGGD0064

Project Licensee(s)

Cadent

Project Start

June 2015

Project Duration

1 year and 5 months

Nominated Project Contact(s)

Robert Cairns – National Grid Gas Distribution (NGGD),
Mitch Lane - National Grid Gas Distribution (NGGD)

Project Budget

£20,000.00

Summary

The project will include;

- The development of a National Grid specific mobile platform based on EON Experience VR
- The development of up to 3 individual VR/AR models, produced from CAD drawings.
  - **Valve and actuator**

    This will be used in TEM and Pressure control courses so the delegates get an insight to how the internal workings operate.

- **Fisher 310 and 32a pilot**

  This is a difficult regulator and pilot set up to understand – hopefully the 3d imagery and internal working will assist in the classroom explanations.

  - **Axial flow regulator and ZSC 100 pilot**

    A commonly used regulator that fits into lots of our training courses – usually a starting point for HP training so having a 3d model on this will help in lots of courses

- The procurement of an Eon Reality iBench to allow the testing of Augmented Reality in the training environment.
- The procurement of 20 “Cardboard” Virtual Reality Goggles to allow the testing of Virtual Reality in a training environment.
- An assessment of the technology, by undertaking of a 6 month trial of the technology, within the training environment at National Grid Eakring.

Nominated Contact Email Address(es)

Innovation@cadentgas.com

Problem Being Solved

There is a business risk to National Grid that is captured on the risk register – “Risk that knowledge is lost in NG for key assets, key individuals in critical job family roles as identified in the DEC paper because of our aging workforce/age profile analysis and current requirement gaps for Apprentices not being able to join early enough to cover all retirees/ leavers.”

The GDNs have the challenge of mitigating this risk. There is an opportunity to explore the method of capturing complex working procedures using interactive virtual-reality/augmented-reality technology. This will allow the GDNs to create a library of engineering scenarios, which can be delivered on central training courses or remotely accessed by an engineer in a vehicle before they undertake a complex procedure.

Method(s)

The Method would consist of the virtual/augmented reality modelling of various Network assets allowing operatives to view, study and manipulate external and internal working parts to allow for a thorough yet safe understanding of the asset.

The various models will be delivered to the operative via an augmented reality iBench situated at a central training facility or via “Cardboard” virtual reality goggles. These goggles will allow an operative to self-serve their training requirements whilst also delivering an additional platform from which an operative can simply re-familiarize themselves with an asset prior to working on it. The iBench will allow for staff to run through the complex maintenance and repair activities in a classroom environment to ensure competency.

The cardboard goggles will make further use of existing network hardware (e.g. mobile phones) upon which the models will be delivered. The mobile phone will then simply fit inside the goggles which then create the virtual reality feel to the model.

Scope

The project will include;

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Objective(s)

The objective of the Project is to assess whether the modelling of work procedures in Augmented Reality/ Virtual Reality can be utilised within the UK Gas Industry, to support engineers completing complex operational working procedures.

Consumer Vulnerability Impact Assessment (RIIO-2 Projects Only)

n/a

Success Criteria

Production of 3 equipment models

- 3 pieces pf equipment to be modelled by EON Reality on CAD Drawings or Photographic imaging.
- QA assessment of quality of models provided by NGGD Eakring Academy.

Measure feedback from the Trainer

Measuring if the innovation has aided and improved the delivery of classroom theory sessions. This will be captured via a report or testimonial.

- Were learning objectives met?
- Were learning objectives exceeded? If Yes, How? Please give a description.
- What was the duration of the course, comparison vs innovation vs no innovation.
- Did the innovation contribute or hinder the course duration?
- Did the trainees absorb the course material better using the innovation compared to the class that did not use the innovation?
- Did the class retain the course information better using innovation that the class not using innovation?
- Did the trainer feel the class were more engaged using the innovation than not?
- Did the innovation add value to the learning?
- **Measure feedback from the Trainee**

- Did the class feel more engaged using innovation compared to not?
- Was the learning experience improved using innovation?
- Do you feel the innovation was a valuable learning technique?
- Did the innovation assist learning? - review of those who do not use the technology will provide feedback and then use the technology to assess if learning was assisted.
- Did the innovation assist you in your learning?
- **Integration review from Academy Technical Lead**

- Analyse the suitability (value adding) within the classroom environment?
- Analyse the accessibility of the material for the end user?
- How adaptable is the equipment?
- What does the implementation scale look like for National Grid?

Project Partners and External Funding

n/a

Potential for New Learning

n/a

Scale of Project

The project will

- Run for 6 months at the National Grid Eakring Training Centre.
- Involve development of 3 VR/AR models by EON Reality.
- Deliver and iBench and 20 Virtual Reality goggles from EON Reality.
- Initially focus on the Operate and Maintenance Project.

Technology Readiness at Start

TRL7 Inactive Commissioning

Technology Readiness at End

TRL8 Active Commissioning

Geographical Area

National Grid Gas Distribution Academy

Revenue Allowed for the RIIO Settlement

None

Indicative Total NIA Project Expenditure

£15,000 – External

£3,500 – Internal

£1,500 – Contingency

£20,000 – Total NIA Funding

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)

Savings associated to the project will reduce National Grid carbon footprint of travelling to site for training activities that could be undertaken remotely, also the reduction in manpower costs for accommodation, unavailable for work allocation would be reduced by the reduction in need to travel to a central location, when the mobile platform will allow engineers to access material remotely.

Please provide a calculation of the expected benefits the Solution

Savings will be calculated in the output report of the project.

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

As previously stated the Method can be considered fully replicable across at Network Licensees. It can be reasonably assumed that many of the assets being modelled will be identical; all of the Networks will be in a similar position in terms of the Problem areas identified; and that all Networks will be in a similar position in terms of smart device rollout.

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

The potential roll out of this technology will be analysed as part of this project, and has the potential to be rolled out nationally within National Grid. With each Training Centre owning an iBench and set of 20 goggles, to the potential for each engineer owning a pair of goggles.

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

All Network Licensees will be able to use the learning generated from this Project as it can be reasonably considered that the Problem identified is one shared across the GB Gas Distribution sector. It can also be reasonably considered that each of the GB Gas Distribution Networks are of a comparatively similar stage of smart device rollout (e.g. Smart Phones and Tablets) or certainly enough to adopt any new learnings developed by this Project.

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